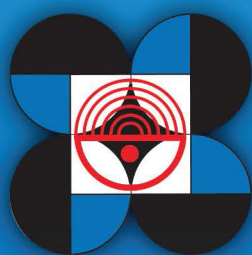


PHILIPPINE SCIENCE & TECHNOLOGY ABSTRACTS



**SCIENCE AND TECHNOLOGY INFORMATION INSTITUTE
INFORMATION RESOURCES AND ANALYSIS DIVISION**

**Department of Science and Technology
Bicutan, Taguig City, Metro Manila
Philippines**

JUNE 2021



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SCIENCE AND TECHNOLOGY INFORMATION INSTITUTE
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Farmers' participatory seed production of IPB-bred varieties in relation to climate change adaptation

Navarro, Rudy S. , Beltran, Marilyn M. , Magdalita, Pablito M. , Quilloy, Reynaldo B. , Narciso, Josefina O., Magpantay, Maria

The participation of farmers residing in agrarian reform communities towards the use of selected IPB-bred vegetable and peanut varieties was assessed. Purposive sampling of 18 pre-selected farmers was done and were trained on seed production and cultural management practices of these varieties at the Institute of Plant Breeding. After the implementation of seed production activities in their respective places, it was found that there was a dramatic increase in the amount of vegetable and peanut seeds produced in Antique, Samar, Davao del Sur and South Cotabato. The amount of seeds produced by farmer participants from Samar was highest at 96.2%. In contrast, the farmer participants from La Union produced the lowest amount of seeds. In relation to climate change adaptation, based from survey, the farmers will be considering a few adjustments in the future implementation of farming activities like adjustments to be made in the planting calendar of these varieties by the farmer participants due to heavy rains occurring starting September every year. Also, farmers will implement utilization of the legume residues for composting to produce organic fertilizers which was considered by all (100%) farmer participants. The peanut that can fix nitrogen from the air were also considered for crop rotation by majority (83.33%) of the farmers in order to lessen the use of inorganic fertilizers causing soil acidity. Further, the farmers indicated that peanut will be utilized for sequential cropping after rice to bring back soil fertility. All farmer participants from Antique, Samar, Davao del Sur and South Cotabato indicated the further adoption of the IPB-bred varieties in future production system. There was a highly significant association of the farmer participants' selected demographic variables with the amount of seeds produced.

Keywords: *Adoption, Farmer participation, IPB-bred varieties, Peanut, Vegetables, Agriculture*

Journal of Environmental Science and Management, Volume No. 16 Issue No. 1, 63-71
2013,
(Filipiniana Analytics)
NP

The indigenous practices and climate change responses of Ati and Suludnon farmers in Iloilo, Philippines

Espaldon, Maria Victoria O. , Brillon, Jelly A. , Tatlonghari, Rosario V. , de Guzman, Lucille Elna P. , Nelson, Gloria Luz M., Zamora, Oscar

Climate change has become a major threat to the livelihoods of many farmers in the Philippines, particularly among the indigenous groups. It has been recognized that traditional knowledge is an important source of information for climate change adaptation, for embedded into it are coping strategies evolved through and passed on to generations. This study documented through key informant interviews, focus group discussions and farm visits the indigenous knowledge for climate change adaptation of the Suludnons and Ati in Iloilo. Since 2003, their communities experienced climate change as manifested by strong typhoons, landslides, and the various forms of crop and human diseases. Their responses to climate change include biodiversity-based cropping systems, changes in cropping calendar, use of indigenous varieties, consumption of nontraditional/ wild foods, indigenous warning systems and diversified income sources. Both indigenous groups are beneficiaries of government and non-government projects, grants and agricultural trainings where they learned new farming technologies. The traditional practices combined with the adoption of selected agricultural technologies have helped the have helped the Suludnon and the Ati groups become become sustainable and climate-resilient farming communities amidst the adverse impact of climate change on their lives.

Keywords: *Climate change adaptation, Indigenous peoples, Indigenous knowledge, Suludnon, Ati, Agriculture*

0003

Policy implications of the effectiveness of Philippine hybrid rice program *Magbujos-Salagubang, Mary Rose*

In an attempt to increase rice production and to attain rice self-sufficiency in the Philippines, hybrid rice technology has been acknowledged and is now becoming a trend in the rice industry. Under the Department of Agriculture's Gintong Ani Program, hybrid varieties have been demonstrated on large-scale farmers' field trials at eleven provinces targeted for hybrid rice cultivation. The current state of the technology has been reached through collaborative efforts by members of the national rice R&D network spearheaded by PhilRice, the International Rice Research Institute (IRRI), and members of the private rice seed industry. Two hybrids, Magat and Mestizo, have been released in the country, hybrid rice seed production and cultivation technologies have been developed and packaged in the form of manuals, video tapes and other information dissemination materials, a critical mass of researchers, extension workers, and other key players in the rice seed industry and the national government have been educated on the various aspects of the technology during training courses held at IRRI and PhilRice, and the economic viability of hybrid rice cultivation and seed production have been studied and demonstrated. However, there is much to be done for hybrid rice technology to gain a solid foothold in Philippine rice agriculture. Challenges must be addressed to ensure that the increased yield levels attained in technology demonstration trials will be realized on farmers' rice fields leading to increased farm productivity and farmer-incomes. The development and use of hybrid rice technology in the Philippines provides a good example on how an international agricultural research centre and a national agricultural research system could jointly develop and benefit from a technology usable by the farmers for increasing rice yields.

Keywords: *Hybrid rice, Production, Inbred varieties, Hybrid technology, Agriculture*

ANTHROPOLOGY

0004

Against federalism: why it will fail and bring us to the brink *Ocampo, Romeo*

The proposed shift to a federal form of government is unlikely to succeed and may lead instead to the dismemberment of the Philippines. Given the dominant Pimentel model of the proposal, federalization will critically weaken the central government by sharing its sovereign powers, devolving most of its functions, and substantially more of its resources with the new component states. Rather than promote equitable development, federalization, according to this model, will promote interstate competition and thus enable the better-endowed regions to develop farther ahead of the others. The central government will be too emaciated to equip weaker states to catch up, aggravating their laggard conditions and may further fuel secessionist sentiments. While one possible effect of federalization may be to inhibit centrifugal tendencies, it also risks sufficiently arming defection-prone states to secede and leads to the breakup of the nation-state. This article argues that, for all its faults, the existing unitary system is better because it can do at least one thing a federal government can no longer do, that is, redress imbalances in favor of lagging regions and retrieve devolved power if it is misused. Moreover, the parliamentary system that the proponents put on top of their federal structure may be able to do far fewer things

faster and will be less democratic than the central as well as areal division of powers embodied in the existing unitary system of the Philippine government.

Keywords: *federalism in the Philippines, federal vs. unitary, government systems, Pimentel model, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 106-126
2017,
(Filipiniana Analytics)

0005

From ancient entrepôt to 21st century hub: a critique of Butuan City's administrative potentials at the geospatial margin

Gomez, Jose Edgardo A. Jr.

The City of Butuan in Agusan del Norte province occupies an important niche as a regional commercial and institutional center in the northeast quadrant of Mindanao island. Rooted in an identity dating back to precolonial times, it is building itself up as an emerging major hub of transportation and agricultural productivity in contrast to its less environment-friendly past as a logging and mining center. This research takes a critical stance by describing and reviewing the key advantages and disadvantages of Butuan City and its environs from a geospatial, administrative, and planning perspective. It shows that despite the recent emergence of political-institutional advantages, Butuan will always be constrained by certain locational features. Describing its present and potential land and sea usage, this study suggests other ways that Butuan City, in so far as it is a nexus of the province and of the Caraga Region, might yet continue to grow and profit from its peculiar placement in the far northeast of Mindanao.

Keywords: *Butuan City, cluster, infrastructure, periphery, reformist officials, satellite governance, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 1-25
2019,
(Filipiniana Analytics)

0006

Assessment of the implementation of the plastic bag reduction ordinance in Quezon City (2012-2016)

Braganza, Patricza Andreea T.

The Plastic Bag Reduction Ordinance has been implemented in Quezon City since 2012 to regulate the use of plastic bags in an attempt to address plastic pollution. This study assessed the implementation of the ordinance. Customers' use of recyclable bags was directly observed in four retail stores in the District 4 of Quezon City. A survey was also conducted among 120 residents from six barangays comprising Area 24, District 4 of the city to gather data on awareness of and compliance to the ordinance. Focus group discussions and interviews with city government officials and store managers, among other stakeholders, were also conducted to enrich quantitative data. Survey results showed high level of awareness of the ordinance, but lower level of awareness of the green fund. Results of the chi-square test of independence revealed that awareness significantly differed across barangays. It is also revealed that the ordinance affects stakeholders in different ways, and that it may have somewhat reduced the percentage of plastic waste collected from households in the city. Lastly, retail stores face administrative challenges in translating green fund into meaningful environmental programs.

Keywords: *Plastic Bag Reduction Ordinance, green fund, policy implementation, Quezon City, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 20-42
2017,

0007

Borders and decisionmakers: an institutional analysis of municipal merger in Japan

Tumanut, Michael A.

Municipal merger has been the structural reform choice in Japan for over a century. For over two decades, it has been integral to the decentralization policy and in addressing economic stagnation, depopulation, and ageing population. While the literature on this is replete with analysis on its outcome (i.e., efficiency), application of an institutional approach particularly explaining decisiveness and temporal variation in municipal merger experience is sparse. Employing a case study approach, secondary sources and interviews with Japanese ministry officials and academics directly involved in merger, this paper re-examines this policy area framed by simplified and interpreted veto players theory. In municipal merger, Japan is found to have a small, locally-concentrated and cohesive constellation of veto players. Constitutional games played by the National Diet resulted in copious merger laws and amendments to instigate favorable territorial reform rules, and to influence congruence of preferences at collective-choice game played by municipalities. The tripartite function of merger reform agent (the Liberal Democratic Party) is instrumental in influencing cohesion in local councils, in informally invoking the emissary role of prefectural governments to promote merger, and in reshaping preferences of veto players through continuous amendment of merger law and insertion of incentives or disincentives.

Keywords: *gerrymandering, municipal consolidation, municipal merger, municipal reorganization, state rescaling, territorial reform, veto players, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 2, 154-178
2018,
(Filipiniana Analytics)

0008

Eight waves of reform initiatives in Philippine port administration and governance

Basilio, Enrico L.

This article is an account of the reform initiatives in the Philippine port sector, from the creation of the Philippine Ports Authority (PPA) in the 1970s as the main port planning agency, port developer, operator, and regulator, to the privatization of the operations of major public ports and terminals in the 1980s, the creation of independent port authorities in the 1990s, the establishment of the Strong Republic Nautical Highways (SRNH) in the 2000s, and the current effort of the government to separate the conflicting regulatory and commercial functions of the PPA by amending its charter. Contributing to the success and/or failure of these reforms were the differing and, in some cases, conflicting interests of the reform actors and their degree of influence.

Keywords: *port administration, governance, privatization, private sector participation, political economy, policy reform, policy development, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 48-80
2019,
(Filipiniana Analytics)

0009

Empowerment, satisfaction, commitment, and retention intention among women in the military: the case of the Philippine Navy

Castillo, Michelle C.

State policies and programs in the Philippines have paved the way for more women to participate in the peace and security sector, particularly in the military, in recent years. These policies are incorporated in the larger gender and development (GAD) policy of the government. This article assesses whether the GAD policies and programs actually translate to the retention of female military personnel in the Philippine Navy, one of the three branches of service of the Armed Forces of the Philippines. It measures the satisfaction of female military personnel on policies on women empowerment and protection against sexual violence, together with job satisfaction and organizational commitment, and evaluates whether these factors have an effect in their decision to stay or leave the military profession. The revised gendered model shows that the most significant factor affecting the intention of female soldiers of the Philippine Navy to stay is organizational commitment while job satisfaction has more direct and significant positive effect on organizational commitment, with satisfaction on women empowerment and participation having a direct positive effect on both organizational commitment and job satisfaction. The female soldiers' experience of sexual harassment in the organization lowers their level of satisfaction on the organization's programs on women empowerment and participation.

Keywords: *job satisfaction, organization commitment, Philippine Navy, retention intention, women empowerment, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 26-47
2019,
(Filipiniana Analytics)

0010

Finding the soul in Philippine regulation: Amartya Sen, social justice and the Urban Development and Housing Act of 1992

Flores, Herisadel P.

This study explores the limitations of the economic theory of regulation and finds that: (i) it fails to explain why some regulations pursue ethical and moral objectives; and (ii) it does not provide much normative guidance on how regulation could be used to bring about desirable social outcomes (e.g., social justice). In this light, the ideas of Amartya Sen on social justice are presented as a complementary, if not an alternative, approach in explaining and evaluating the pursuit of ethical objectives through regulation. A cursory assessment of the regulatory provisions of the Urban Development and Housing Act of 1992 and their implementation was done to demonstrate the feasibility of using Sen's approach in this type of undertaking. In doing so, content analysis of the law, as well as a review of existing studies by other authors on its implementation, was employed in a summary study approach. The conclusion summarizes the insights from the assessment exercise and asserts the practicability of Sen's approach.

Keywords: *Amartya Sen, regulation, social justice, urban development and housing, Anthropology*

Philippine Journal of Public Administration, Volume No. 57 Issue No. 2, 141-166
2013,
(Filipiniana Analytics)

0011

Hope: dealing with wicked problems of government

Ocampo, Romeo B.

This essay explores the possibility of hope in dealing with difficult problems and failures of government through critical analysis and reforms of public planning and policy decisionmaking. It examines the assessments made by different authors of the failures of scientific planning and of the social sciences in informing planning and policy, and their proposals for improving the concepts and methods for social, historical, and policy research. The first section introduces the basic ideas about wicked problems thought inherent in government and life and about hope as a realistic view of goals that are difficult but not impossible to reach. The succeeding sections deal with: (a)

alternative modes of planning and decisionmaking; (b) accounts of the persistence and failings of grandiose schemes of “high-modernist” statecraft and prescriptions to make planning more responsive to the complexity of unplanned development; (c) efforts to explain the failures of social science as due to its mistaken emulation of the hard sciences and to re-orient it also toward prudential or practical wisdom; (d) long histories of why the West came to dominate the world, the choices made by some societies that led to their demise or success in overcoming crises and ideas about how to improve history as a science; (e) unconventional innovations advocated in economic development planning and information systems design; and (f) my own concept of a middlerange bridge between competing reform proposals, as suggested by the notions of policy versus basic research and framework for understanding institutional diversity at sub-system or local levels of governance. Given the foregoing premises, we can hope to deal effectively with wicked problems of government.

Keywords: *governance, reforms, public planning, policy decisionmaking, scientific planning, research framework, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 2, 179-194
2018,
(Filipiniana Analytics)

0012

Improving human resource capacity: exploring certification in local governments *Calugay, Zita Concepcion P.*

The proposed institutionalization of certification pathways for local government officers and staff is a step towards the continuing capacity building to raise the qualifications standards and improve the professionalization of the local government bureaucracy. Certification as a concept serves to validate that the local officers and staff possess and are able to demonstrate the required competencies for the job in accordance with set standards, and thus counteract the common perception that they are inefficient, lacking in skills, and hired based on political influence. Two existing and comparable certifications systems, namely, the Technical Education and Skills Development Authority (TESDA) national certification system for technical and vocational skills, and the Local Government Training Package in Australia are analyzed in formulating a model for local government certification system. The proposed local government certification system will require policy reforms geared towards the recognition of the local government sector as an industry and establishment of a qualifications framework for the local government industry. Different institutional arrangements or modalities including the centralized, collaborative, privatized and mixed models may also be explored in pursuing the certification system.

Keywords: *certification, human resource management, local government, local government personnel, certification in local government, Anthropology*

Philippine Journal of Public Administration, Volume No. 57 Issue No. 2, 115-140
2013,
(Filipiniana Analytics)

0013

Integrated approach for smart city index development: from concept to indicator weighting *Zou, Xialong, Li, Yan*

Smart city (SC) initiatives are the new megatrend in urban development. Several concepts and frameworks have been proposed to interpret what constitutes smart cities, but they have not yet reached universal acceptance. This study aims to propose a new conceptual framework for smart cities with an integrated index for better understanding and practical implementation of SC projects. The conceptual framework is proposed after reviewing SC literature under policy analytical method. Based on the framework, an index consisting of six domains, 18 aspects and 36 supporting indicators is proposed. The analytical hierarchy process (AHP) was applied

for indicators weighting for prioritization or key performance indicator (KPI) selections. This study would contribute to more insights in understanding smart cities and their evaluation for policymakers, academia, urban managers and practitioners.

Keywords: *smart city, urban development, smart city framework, analytical hierarchy process, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 1, 1-20
2018,
(Filipiniana Analytics)

0014

Islam, Bangsamoro and democracy *Rasul-Bernardo, Amina*

Despite its potential for growth and development, the Bangsamoro region has seen decades of demographic marginalization, repression, and underdevelopment. These social problems, which were attributed to colonialization, are further aggravated by armed conflict between rebel groups and the government, and weak legal framework for regional autonomy. In her speech, Amina Rasul-Bernardo argues that the Bangsamoro conflict can only be addressed with a better understanding of its history and context. Rasul-Bernardo urges the passage of a Bangsamoro Basic Law that strengthens regional autonomy and ensures genuine, sustainable development in the region.

Keywords: *Bangsamoro conflict, Bangsamoro history, regional autonomy, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 91-105
2017,
(Filipiniana Analytics)

0015

Job satisfaction of disaster responders: the response operation for the APEC economic leaders' meeting 2015 *Perez, Joe-Mar S.*

Disaster responders work to ensure the safety and security of communities during emergencies. However, the job satisfaction of disaster responders in the Philippines has not yet been thoroughly analyzed as a subject of research in the field of organization studies. The article examines the job satisfaction of disaster responders mobilized by the National Disaster Risk Reduction and Management Council (NDRRMC) during the Asia-Pacific Economic Cooperation Economic Leaders' Meeting held from 18 to 19 November 2015 in Pasay City. Using Frederick Herzberg's Two-Factor Theory as the framework, it analyzes how motivation, hygiene, and demographic factors affect the job satisfaction of disaster responders. Findings reveal that the job satisfaction of disaster responders is positively affected by recognition, responsibility, and relationship with peers, but negatively affected by age. Furthermore, motivation factors significantly affect job satisfaction. Notably, the significant job satisfaction factors contribute to the innate desire of disaster responders to help others in times of emergencies. The article confirms the assumption of the Two-Factor Theory that motivation affects job satisfaction.

Keywords: *disaster response, job satisfaction, Two-Factor Theory, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 2, 129-153
2018,
(Filipiniana Analytics)

The mainstream discourse on good governance for developing countries: issues and challenges

Raquiza, Ma. Victoria R.

Good governance is widely viewed as a requisite to achieving economic growth and development especially for developing countries. Amidst the variety of good governance discourse given the elasticity of its definitions and dimensions, the dominant one is that championed by international financial institutions, in particular the World Bank and, oftentimes, the economic policy elites in a number of developing countries. This governance paradigm essentially seeks to enhance a country's market operations and articulates the institutional requisites to make this happen. There are many conceptual, methodological, and practical—including implementation—issues, however, that afflict the mainstream good governance paradigm, raising serious questions about its intellectual moorings and relevance for developing countries.

Keywords: *mainstream governance discourse, structural adjustment program, developing countries, foreign aid, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 1, 81-108
2018,
(Filipiniana Analytics)

NPM, business process re-engineering and local governments

Ilago, Simeon Agustin

The article explores the process of re-engineering in the business permitting and licensing systems (BPLS) of local governments over a five-year period (2010-2015). Review of secondary data and official documents on the BPLS reform program and process analysis of the streamlining approaches used by two local government units (LGUs) for their BPLS procedures both reveal differences, limitations, and constraints in implementation at the local level. The article argues that, despite the attempt to converge BPLS streamlining efforts by issuing uniform standards and guidelines, implementation varies due to the decentralized and political context, the local government officials' understanding of the process and its elements, and their perception of the policy problem. The article then suggests areas for future research along this line.

Keywords: *new public management, business process re-engineering, business permitting and licensing system, local government units, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 1-19
2017,
(Filipiniana Analytics)

Public administration as a scholarly discipline today—and how ICT will affect it

Drechsler, Wolfgang

After sketching out how Public Administration (PA) scholarship looks today, this lecture asks how information and communication technology (ICT) will, or might, influence it in the near future. First, we look at what information and communication technology can already do today and how it has changed our life-world by 2017. Two critical, interlinked phenomena are then analyzed: MOOCs (massive open online courses) and their effects, and the current ability of algorithms to write a certain type of texts. These may have the effect to strongly enforce,

even lock in, the current tendencies of PA, but they may also give rise to an altogether different kind of development of scholarly inquiry in the discipline and beyond.

Keywords: *Public Administration, ICT, algorithms, MOOCs, Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 127-141
2017,
(Filipiniana Analytics)

0019

Public administration as design

Ocampo, Romeo

Since the close of World War II, Public Administration students have been urged to move from the concept of the discipline as doing and deciding to that of designing, i.e. elaborating prescriptions in the manner suggested for policy vs. academic research. Design had long been a part of planning for the built environment (architecture, city planning, and urban design). Since the publication of Herbert A. Simon's *The Sciences of the Artificial*, however, design has been taken up increasingly in the literature of public policy and administration. While still basically goal-oriented, this literature puts greater emphasis on the institutional context, on problem-definition and alternatives-generation, and on decision-making as a framework. Theoretical perspectives, concepts, strategies, and techniques have been developed for public policymaking, implementation, and organizational design. This article attempts to assess the progress of design ideas, glean fundamental points from the literature, and suggest how design may deal meaningfully with some PA issues in the Philippine context, with the hope that they will apply as well to larger contexts.

Keywords: *design, decision-making, policy design, social planning, heresthetics, bricolage, Anthropology*

Philippine Journal of Public Administration, Volume No. 57 Issue No. 2, 200-224
2013,
(Filipiniana Analytics)

0020

A review of citizen participation issues, responses, and prospects for reform in local development councils

Medina-Guce, Czarina

This article conducts a review of citizen participation in local governance within the context of the local development councils (LDCs). It argues that the Local Government Code has prescribed citizen participation with a limited set of standards, namely, the 25% civil society membership in the LDC and the administrative indicators of activities that the LDC must perform. The Code and subsequent LGU performance measures it influenced have insufficiently addressed the roles to play and capacities needed by civil society to realize higher levels of citizen participation in the LDCs. Moving forward, the study takes stock of citizen participation initiatives that make explicit the roles and capacities of civil society organizations in local decision making and draws lessons to suggest prospects for deepening and increasing citizen participation in LDCs. The article ends with a note that citizen participation should be in the core agenda of proposed amendments in the Code.

Keywords: *local development council, local government units, citizen participation., Anthropology*

Philippine Journal of Public Administration, Volume No. 61 Issue No. 1-2, 43-70
2017,
(Filipiniana Analytics)

**Social network analysis on the information exchange of Sorsogon City's CDRRMC
during Typhoon Nina**
Buenaobra, Nissi Abigail J.

The local government units (LGUs) act as frontline agencies in disaster response. To ensure the welfare of their constituents, they perform necessary emergency measures before, during, and after disasters. Crucial to the LGUs' role is an effective information exchange network with other government agencies, private entities, and nongovernment organizations. Information exchange during disaster response has been a recurring challenge for authorities as the variables are complex, the environment is unpredictable, and the information demanded and supplied varies. By using social network analysis (SNA), this study explored the information exchange in the interorganizational network of key actors during the disaster response for Typhoon Nina (Nock-Ten) in Sorsogon City, Philippines in 2016. By generating a visual map of the network, SNA enabled the authors to identify the possible information exchange failures, central suppliers and consumers of information, vehicles of information, and macro-level assessment of its effectiveness. This article strengthens the proposition that the actors in the communication network are all essential in the prompt delivery of services during the typhoon. The evident interaction of actors further established a holistic and substantive information, which helped them make informed decisions for their response efforts.

Keywords: *information exchange, communication network, interorganizational network, social network analysis, disaster response, disaster risk reduction and management council, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 49-76
2019,
(Filipiniana Analytics)

**Do the regional development councils matter in promoting regional development? a
historical evidence**
Celestino, Ali

As early as the 1970s, regional development has been adopted by the government as both a goal and strategy for national development. The regional development councils (RDCs) were created to play a critical role in the promotion of regional development. It has been almost five decades since their existence but regional disparities in the country still remain a reality putting to doubt their efficacy. In the light of the federalism debate which enkindled renewed interest in regional development, this article reviews the historical performance of the RDCs to aid policymakers in coming up with policy alternatives to the RDC system. What ails the RDCs? How can they be revitalized? These are some questions central to the assessment of their performance in promoting regional development.

Keywords: *decentralization, regionalization, regional development, administrative coordinating mechanisms, regional disparities, disjointed planning-budgeting, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 1, 21-47
2018,
(Filipiniana Analytics)

Transport priority for infrastructure vs. services: BBB and urban transport policy

Ocampo, Romeo

The Build, Build, Build (BBB) Program was launched by the Duterte administration in 2017 as its strategy to hasten economic growth and deal with transport problems, including the critical traffic congestion in Metro Manila. Implementing BBB, however, may be easier ordered than done. This policy note tries to show how BBB is part of the legacy of historical and present-day partiality to road-building. Caution is particularly called for in using road infrastructure, which have been hobbled by various constraints, which have been hobbled by various constraints, which have been hobbled by various constraints, as the leading solution to traffic congestion and other transport problems in large urban areas. The challenges in transport planning and design are much more formidable, as indicated by the shortcomings of past plans and projects against the problems. The roadbuilding solution to traffic congestion is short-lived in effectiveness due to induced travel demand. Studies abroad show that this is a complex phenomenon in which land development along road improvements influence traffic and deserve systematic attention. Such studies should also be undertaken in our metropolitan areas to ascertain whether and to what extent the findings abroad apply to our context. The article concludes with suggestions for attending to some unfinished business in urban transport policy, planning, and administration. It ends with parting notes on the study of public services and Public Administration.

Keywords: *transport infrastructure, transport services, Duterte administration, transport planning, Anthropology*

Philippine Journal of Public Administration, Volume No. 63 Issue No. 1, 77-105
2019,
(Filipiniana Analytics)

Untwining twinning: a cursory examination of sister city relations in the Philippines

Berse, Kristoffer B.

The latter half of the 20th century saw the active interlinking of cities globally and domestically, facilitated in large part by the proliferation of sister city or town twinning arrangements. However, while this has been taking place steadily across and within countries, few studies have been made, if at all, looking at the specific experience of local authorities from the so-called South in general, and the Philippines in particular. This article attempts to fill this lacuna by examining the nature and scope of bilateral sister city relationships among local authorities in the Philippines. Findings from a mixed-mode survey (41% response rate, 144 cities) administered in 2015-2016 show that study visits and information exchange account for most of the interconnectivity of local governments. More than half of the participating cities organized study visits related to local economic promotion (LEP) and disaster risk management (DRM). But the potential for collaborative problem-solving or even co-production of knowledge to improve DRM, LEP, or any other aspect of urban management has yet to be fully realized. From a network perspective, the interconnectivity between and among local governments was found to be weak, with many of the relations seemingly established independent of preexisting ties. In many cases, the partnership seems to be anchored on big sister-little sister arrangement. Structure-wise, there appears to be no systematic process of matching the needs and resources of the participating local governments, other than to establish political ties that may or may not be tapped to improve DRM or facilitate LEP by either party. Given its very limited practice and benefits, sister cities are not well monitored and sustained. Changes in leadership and constraints in budgeting and staffing also render the partnership spotty or mostly non-functional.

Keywords: *sister cities, town twinning, city-to-city, interlocal cooperation, network analysis, trans-scaling, Anthropology*

Philippine Journal of Public Administration, Volume No. 62 Issue No. 2, 109-128
2018,
(Filipiniana Analytics)

A VSO-Bahaginan framework for active citizenship

Alampay, Erwin Gaspar A.

This article is based on a commissioned work for the Volunteer Service Organization (VSO)-Bahaginan to develop its organizational framework for active citizenship. The primary objective of the paper is to define the role of VSO-Bahaginan in the development of active citizenship in individuals and communities. The resulting framework derived in this paper was based on surveys, interviews and focused group discussion with various VSO-Bahaginan stakeholders, including volunteers and staff. This complemented other workshop outputs and secondary data provided by VSO-Bahaginan. Taken together, these inputs were used in crafting an active citizenship framework that is culturally sensitive to Filipino values. It discusses how VSO-Bahaginan volunteers describe the progression of active citizenship, from kamalayan (awareness) to kamulatan (consciousness) to having a paninindigan (conviction), as an agent of change.

Keywords: *VSO-Bahaginan, active citizenship, volunteerism, civic engagement, Anthropology*

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2017,
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BIOLOGY

A AAA ATPase Cdc48 with a cofactor Ubx2 facilitates ubiquitylation of a mitochondrial fusion-promoting factor Fzo1 for proteasomal degradation

Nahar, Sabiqun , Chowdhury, Abhijit , Ogura Teru , Esaki, Masatoshi

Dynamic functionality of mitochondria is maintained by continual fusion and fission events. A mitochondrial outer membrane protein Fzo1 plays a pivotal role upon mitochondrial fusion by homo-oligomerization to tether fusing mitochondria. Fzo1 is tightly regulated by ubiquitylations and the ubiquitin-responsible AAA protein Cdc48. Here, we show that a Cdc48 cofactor Ubx2 facilitates Fzo1 turnover. The Cdc48-Ubx2 complex has been shown to facilitate degradation of ubiquitylated proteins stacked at the protein translocation complex in the mitochondrial outer membrane by releasing them from the translocase. By contrast, in the degradation process of Fzo1, the Cdc48-Ubx2 complex appears to facilitate the degradation-signalling ubiquitylation of the substrate itself. In addition, the Cdc48-Ubx2 complex interacts with Ubp2, a deubiquitylase reversing the degradation-signalling ubiquitylation of Fzo1. These results suggest that the Cdc48-Ubx2 complex regulates Fzo1 turnover by modulating ubiquitylation status of the substrate.

Keywords: *AAA ATPase, Cdc48, Degradation, Mitochondria, Ubiquitin, Biology*

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Allelopathic effects of three intertidal marine macrophytes on the growth of *Nanochlorum* sp.

Dy, Danilo T. , Abao, Jr., Rex Samuel A. , Aaron, Jemma Lucitte J. , Wagas, Ethel C. , Belleza, Dominic Fra

Benthic marine macrophytes produce secondary metabolites which when released to the environment could potentially influence the immediate surroundings to the detriment of their competitors (i.e., other species of algae

or phytoplankton). The response of the phytoplankton, *Nanochlorum* sp. to crude extracts (1% and 4% concentration) of the intertidal macrophytes *Gracilaria salicornia*, *Chaetomorpha linum* and *Sargassum polycystum* was investigated. On the average, there was a significant decrease (40-61% decrease at 4% conc. and 11-40% decrease at 1% conc.) in cell densities three days after the addition of the extracts relative to the control. Crude extracts of some common intertidal macrophytes may contain allelochemicals that could inhibit the growth of phytoplankton. The potential applications of these allelopathic effects in controlling phytoplankton blooms in small ponds and tanks have been suggested and needs further investigation.

Keywords: *Gracilaria salicornia*, *Chaetomorpha linum*, *Sargassum polycystum*, Reef flat, Phytoplankton control, Mactan Island, Biology

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2019,
(Filipiniana Analytics)
NP

0028

Assessment of genetic diversity of narra (*Pterocarpus indicus* Willd.) populations from various seed sources in the Philippines Using RAPD

Lapis, Aida B. , Calinawan, Nenita M. , Cagalawan, Aimee G. , Magpantay, Gracetine D. , Delos Reyes, Maria Theresa A.

Pterocarpus indicus Willd. (narra), a critically endangered group, is one of the priority species for conservation and reforestation in the Philippines due to its economic, industrial, and ecological importance. A range of 29 to 40 individual samples from each of six seed sources from the Philippines were tested for genetic diversity using 11 RAPD markers. A total of 134 loci were detected, 129 of which were polymorphic. The mean genetic diversity within population was found to be moderate at 0.3183, which could be attributed to the deciduous and outcrossing nature of narra. The genetic differentiation among populations (0.0575) and Wright's Fixation Index (0.1528) suggests nearness of the populations to each other and distance from fixation of alternative alleles in the populations. The genetic distance and cluster analysis did not conform to geographical distribution, but revealed the relationships and the possible origin/s of the individuals of the populations. The results of the study is useful in the selection of sources of good planting materials for the improvement of narra tree in the Philippines.

Keywords: DNA, Genetic diversity, Polymorphism, *Pterocarpus indicus* Willd., RAPD, Biology

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2016,
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NP

0029

Assessment of plant diversity and associated mycorrhizal fungi in the mined-out sites of Atlas Mines in Toledo City, Cebu for bioremediation

Raymundo, Asuncion K. , Cadiz, Nina M. , Pampolina, Nelson M. , Aggangan, Nelly S.

The diversity of plant and mycorrhizal fungi within the 35,000-ha of the Atlas Minesin Toledo, Cebu, was surveyed with the goal of rehabilitating their mined-out area through bioremediation (the use of dominant plants and mycorrhizal fungi present in area to contain/reduce pollutants). From five one km transect lines in five sites, the survey indicated that the vegetation was classified as a disturbed grass-shrubland-savanna-agroforest plant community with tree plantations in rehabilitated sites. Plant composition comprised 69 species belonging to 66 genera and 35 families which include trees, shrubs, herbs, creepers, vines, agricultural or agroforest crops. Fruit bodies of ectomycorrhizal fungi (ECMF), namely: *Pisolithus*, *Scleroderma*, *Thelephora* and *Boletellus* were found under *Acacia auriculiformis*, *A. mangium*, *Eucalyptus urophylla* and *E. camaldulensis*. *Pisolithus* were the most

dominant. For arbuscular mycorrhizal fungi (AMF), out of 50 plants collected, 10-100% roots of *Lycopodium*, *Saccharum spontaneum*, *Nephrolepis*, *Acacia mangium* and *Stachytarpheta jamaicensis* were colonized by AMF. All roots of *S. jamaicensis* were colonized solely by *Glomus* sp. *Pithecellobium dulce* harboured the highest spore density (2,575 spores/plant/30g dry soil), consisting of *Glomus* (42%), *Acaulospora* (24%) and *Entrophospora* (37%). *Muntingia calabura* was the only plant associated with *Glomus*, *Gigaspora*, *Scutellospora*, *Acaulospora* and *Entrophospora*, though with low spore population. *Glomus* was the most prevalent among the AMF. The above AMF and ECMF can be mass-produced as biofertilizers for use in bioremediation of mined-out sites and other areas with similar conditions.

Keywords: *Arbuscular mycorrhiza, Ectomycorrhiza, Mined-out area, Plant diversity, Biology*

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2015,

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NP

0030

Aurora kinase A-mediated phosphorylation of mPOU at a specific site drives skeletal muscle differentiation

Karthigeyan, Dhanasekan, Bose, Arnab, Boopathi, Ramachandran, Rao, Vinay Jaya, Shima, Hiroki, Bharathy, Narendra, Igarashi, Kazuhiko, Taneja, Reshma, Trivedi, Arun Kumar, Kundu, Tapas K

Aurora kinases are Ser/Thr-directed protein kinases which play pivotal roles in mitosis. Recent evidences highlight the importance of these kinases in multiple biological events including skeletal muscle differentiation. Our earlier study identified the transcription factor POU6F1 (or mPOU) as a novel Aurora kinase (Aurk) A substrate. Here, we report that Aurora kinase A phosphorylates mPOU at Ser197 and inhibit its DNA-binding ability. Delving into mPOU physiology, we find that the phospho-mimic (S197D) mPOU mutant exhibits enhancement, while the wild type or the phospho-deficient mutant shows retardation in C2C12 myoblast differentiation. Interestingly, POU6F1 depletion phenocopies S197D-mPOU overexpression in the differentiation context. Collectively, our results signify mPOU as a negative regulator of skeletal muscle differentiation and strengthen the importance of AurkA in skeletal myogenesis.

Keywords: *Aurora kinase A, DNA binding, Mitosis, mPOU, Skeletal muscle differentiation, Biology*

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0031

Bacteriological examination and physico-chemical properties of streams receiving industrial effluents in Rosslyn, Pretoria, South Africa

Olowoyo, Joshua O.

The reliance on streams and rivers to provide water for agricultural purposes and to some extent- domestic purpose, is still in existence especially in the semi-urban and rural areas. This study investigated the bacteriological load and physicochemical properties of water from streams receiving industrial effluents and a reservoir receiving wastewater from a hospital. Water samples were collected from March to August, 2015 from ten sampling stations and analysis were carried out following standard procedures. The water pH ranged from 6.21 ± 0.03 – 8.22 ± 0.08 . Phosphate ranged from 0.0 – 7.80 ± 0.38 mg L⁻¹. Nitrate ranged from 0.03 ± 0.04 – 209 ± 2.26 mg L⁻¹ while nitrite ranged from 0.00 – 14.00 ± 0.30 mg L⁻¹. The TSS (total suspended solids) and TDS (total dissolved solids) were in the range 40.0 ± 2.00 – 58.70 ± 130 mg L⁻¹ and 40 ± 6.0 – 1010 ± 45.0 mg L⁻¹ respectively. The bacteriological loads ranged from 4.85 ± 2.0 – 36.5 ± 7.0 cfu 100 ml⁻¹. Sites receiving effluents from industrial and hospital wastes were highly polluted with values obtained for parameters exceeding

the standard set by World Health Organization (WHO). The shapes of the bacteria examined under the microscope were Coccobacilli, Cocci, Vibrio, Diplococci and Bacilli. Vibrio shaped bacteria was only observed from streams receiving wastewater from the hospital. In conclusion, it is necessary to educate people on the danger of using water from these streams and a proper waste management method should be established at the hospital and the industrial areas.

Keywords: *Anions, Bacteria, Pollution, Biology*

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2018,
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NP

0032

Chemical toolbox for ‘live’ biochemistry to understand enzymatic functions in living systems

Komatsu, Toru

In this review, we present an overview of the recent advances in chemical toolboxes that are used to provide insights into ‘live’ protein functions in living systems. Protein functions are mediated by various factors inside of cells, such as protein–protein interactions, posttranslational modifications, and they are also subject to environmental factors such as pH, redox states and crowding conditions. Obtaining a true understanding of protein functions in living systems is therefore a considerably difficult task. Recent advances in research tools have allowed us to consider ‘live’ biochemistry as a valid approach to precisely understand how proteins function in a live cell context.

Keywords: *Chemical biology, Enzymes, Fluorescent sensors, Biology*

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0033

Climate and human-induced changes to lake ecosystems: what we can learn from monitoring zooplankton ecology

Papa, Rey Donne S. , Briones, Jonathan Carlo A.

Long-term time-series data have been proven useful in analyzing the adaptability of zooplankton communities as a response to environmental change. The unique life history and importance of zooplankton in aquatic ecosystems, coupled with the capability of lakes to integrate changes in the surrounding watershed, has given each the recognition as “beacons and sentinels of climate change,” respectively. Aside from this, many lakes have undergone pollution through human-induced eutrophication attributed to extensive lake-shore town development, agricultural waste runoffs, and intensive aquaculture. Implementation of holistic lake management plans in many countries has resulted to the rehabilitation and even reversal of lake eutrophication, and this is, in part, due to regular monitoring and careful analysis of temporal zooplankton community data that came with implemented rehabilitation efforts. As such, monitoring lake zooplankton populations may give us clues as to how changes in the environment, either from human or climate induced changes have already affected lake ecosystems. It is unfortunate however, that such analysis is presently not available in our country due to lack of routine zooplankton monitoring programs. The paper reviewed several successfully implemented lake/zooplankton monitoring programs, highlighted their strong points. The researchers also suggest integrative feasible concepts that are applicable to the country.

Keywords: Lake zooplankton, Long-term monitoring, Biology

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2014,
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NP

0034

Coping with sea-level rise in African Protected Areas: priorities for action and adaptation measures

Brito, Jose C., Naia, Marisa

Sea-level rise, a consequence of climate change, is progressively affecting coastal areas around the globe. In turn, protected areas are keystones for protecting coastal biodiversity and the ecosystems services ensuring sustainable livelihoods. Effective management and adaptation plans are needed to maintain ecological function and integrity. In the present article, we used a coastal digital elevation model to simulate inundation surfaces and a prioritization index for ranking management interventions in 278 coastal protected areas from 27 African countries. Of these, 15 areas and eight countries demonstrated a high need for proactive management actions because of high levels of biodiversity, international conservation relevance, and exposure to sea-level rise. From the array of management actions available, tailored solutions are being implemented according to the morphology and location of the areas. Concerted action by international, government, and local partners is required for successful protection of the areas, including implementation of adaptive plans and monitoring progress schemes.

Keywords: Adaptation measures, Africa, Protected area, Sea-level rise, Socioeconomic development, Biology

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2020,
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0035

Differential roles of two DDX17 isoforms in the formation of membraneless organelles

Hirai, Yuya , Domae, Eisuke , Yoshikawa, Yoshihiro , Tomonaga, Keizo

The RNA helicase, DDX17 is a member of the DEAD-box protein family. DDX17 has two isoforms: p72 and p82. The p82 isoform has additional amino acid sequences called intrinsically disordered regions (IDRs), which are related to the formation of membraneless organelles (MLOs). Here, we reveal that p72 is mostly localized to the nucleoplasm, while p82 is localized to the nucleoplasm and nucleoli. Additionally, p82 exhibited slower intranuclear mobility than p72. Furthermore, the enzymatic mutants of both p72 and p82 accumulate into the stress granules. The enzymatic mutant of p82 abolishes nucleolar localization of p82. Our findings suggest the importance of IDRs and enzymatic activity of DEAD-box proteins in the intracellular distribution and formation of MLOs.

Keywords: DDX17, Intrinsically disordered regions, Membraneless organelles, Nucleolus, Stress granules, Biology

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Enhanced rhizosphere bacterial population in an abandoned copper mined-out area planted with *Jatropha* interspersed with selected indigenous tree species

Pampolina, Nelson M. , Aggangan, Nelly S. , Raymundo, Asuncion K. , Llamado, Arlene L., Cadiz, Nina M.

Rehabilitation was conducted in an abandoned copper mined-out area in Mogpog, Marinduque by interplanting *Jatropha curcas*, a biodiesel source and potential phytoremediator, with different reforestation tree species, *Pterocarpus indicus*, *Cassia spectabilis*, *Lagerstroemia speciosa* and *Bauhinia purpurea*. The effect of the diversification treatment on the rhizosphere bacterial population, known to promote growth of host plant, was analyzed within a fifteen-month period (August 2007 to November 2008). The number of cultivable soil bacteria on-site prior to planting was very low (<0.01 to 2×10^3 CFU per g) owing to soil's acidity (pH 5) and poorly nourished condition. Higher bacterial population was observed from *Jatropha rhizosphere* than soil without vegetation. Bacterial population also varied with diversification treatments. Highest populations (7.3×10^4 to 1.3×10^5 CFU per g) of Cu-, Pb- and Zn-resistant bacteria were observed where in *Jatropha* was interplanted with *Pterocarpus*, *Cassia*, and *Lagerstroemia*. It appears that such treatment enhanced the population of heavy metal-resistant rhizosphere bacteria in *Jatropha* indicative of its potential in bioremediation. Randomly selected isolates were identified as *Arthrobacter oxydans*, *Klebsiella variicola* and *Bacillus* spp, which are all common soil bacteria. Rehabilitation of abandoned, mined-out areas can thus be naturally promoted by diversifying plants being introduced in such sites as this would enhance rhizosphere bacterial population. **(Author's abstract)**

Keywords: Bioremediation, Heavy metal-resistant bacteria, Rhizosphere, *Jatropha*, Interplanting, Biology

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2013,
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NP

FKBP5: a key mediator of how vertebrates flexibly cope with adversity

Zimmer, Cedric, Hanson, Haley E., Wildman, Derek E., Uddin, Monica, Martin, Lynn B.

Flexibility in the regulation of the hypothalamic–pituitary–adrenal (HPA) axis is an important mediator of stress resilience as it helps organisms adjust to, avoid, or compensate for acute and chronic challenges across changing environmental contexts. Glucocorticoids remain the favorite metric from medicine to conservation biology to attempt to quantify stress resilience despite the skepticism around their consistency in relation to individual health, welfare, and fitness. We suggest that a cochaperone molecule related to heat shock proteins and involved in glucocorticoid receptor activity, FKBP5, may mediate HPA flexibility and therefore stress resilience because it affects how individuals can regulate glucocorticoids and therefore capacitates their abilities to adjust phenotypes appropriately to prevailing, adverse conditions. Although the molecule is well studied in the biomedical literature, FKBP5 research in wild vertebrates is limited. In the present article, we highlight the potential major role of FKBP5 as mediator of HPA axis flexibility in response to adversity in humans and lab rodents. **(Author's abstract)**

Keywords: Plasticity, Glucocorticoids, Stress, Epigenetic, Resilience, Biology

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2020,
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Galectin-lattice sustains function of cationic amino acid transporter and insulin secretion of pancreatic β cells

Maeda, Kento

Maintenance of cell surface residency and function of glycoproteins by lectins are essential for regulating cellular functions. Galectins are β -galactoside-binding lectins and form a galectin-lattice, which regulates stability, clustering, membrane sub-domain localization and endocytosis of plasmalemmal glycoproteins. We have previously reported that galectin-2 (Gal-2) forms a complex with cationic amino acid transporter 3 (CAT3) in pancreatic β cells, although the biological significance of the molecular interaction between Gal-2 and CAT3 has not been elucidated. In this study, we demonstrated that the structure of N-glycan of CAT3 was either tetra- or tri-antennary branch structure carrying β -galactosides, which works as galectin-ligands. Indeed, CAT3 bound to Gal-2 using β -galactoside epitope. Moreover, the disruption of the glycan-mediated bindings between galectins and CAT3 significantly reduced cell surface expression levels of CAT3. The reduced cell surface residency of CAT3 attenuated the cellular arginine uptake activities and subsequently reduced nitric oxide production, and thus impaired the arginine-stimulated insulin secretion of pancreatic β cells. These results indicate that galectin-lattice stabilizes CAT3 by preventing endocytosis to sustain the arginine-stimulated insulin secretion of pancreatic β cells. This provides a novel cell biological insight into the endocrinological mechanism of nutrition metabolism and homeostasis.

Keywords: *Glycoprotein, Lectin, Cationic amino acid transporter 3 (CAT3), Insulin secretion, Biology*

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Geometric morphometric analysis of *Channa striata* (striped snakehead) populations from Laguna de Bay, Philippines reveals shape differences in relation to water quality

Torres, Shenna Kate M.

Channa striata, locally known as dalag, constitute a major aquaculture resource in Laguna de Bay. Owing to its popularity as a food source, threats such as overfishing may potentially place this species at risk. However, studies regarding its status within the lake is lacking. One way to address this gap is through population studies using geometric morphometrics. In this study, a total of 82 specimens were collected across three areas of the lake, namely, Binangonan, Calamba, and Tanay. These areas were assessed using secondary data for physicochemical parameters, which revealed significantly higher ammonium-nitrogen levels in Binangonan compared to the other areas. Geometric morphometrics was then used to determine whether shape variation existed among *C. striata* populations. Results showed that shape variation was greatest in the cranial region, with fish from Binangonan and Tanay having the greatest variation in shape. On the other hand, specimens from Calamba had the highest morphometric values. Lastly, these findings were then correlated with water quality data using Canonical Correlation Analysis. Results indicated that shape variation in the cranial region was correlated with differences in dissolved oxygen and pH content of the lake. The weight and length of fish were inversely correlated to the levels of ammonium-nitrogen and total dissolved solids, with specimens from Binangonan displaying a high sensitivity to ammonium-nitrogen.

Keywords: *dalag, freshwater fish, shape variation, Laguna Lake, physicochemical parameters, Biology*

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From germ cells to neonates: the beginning of life and the KEAP1–NRF2 system

Matsumaru, Daisuke , Motohashi, Hozumi

The Kelch-like ECH-associated protein 1(KEAP1)–NF-E2-related factor 2 (NRF2) system is one of the most studied environmental stress response systems. In the presence of oxidative and electrophilic insults, the thiols of cysteine residues in KEAP1 are modified, and subsequently stabilized NRF2 activates its target genes that are involved in detoxification and cytoprotection. A myriad of recent studies has revealed the broad range of contributions of the KEAP1–NRF2 system to physiological and pathological processes. However, its functions during gametic and embryonic development are still open for investigation. Although oxidative stress is harmful for embryos, *Nrf2*^{−/−} mice do not show any apparent morphological abnormalities during development, probably because of the compensatory antioxidant functions of NF-E2-related factor 1 (NRF1). It can also be considered that the antioxidant system is essential for protecting germ cells during reproduction. The maturation processes of germ cells in both sexes are affected by *Nrf2* mutation. Hence, in this review, we focus on the stress response system related to reproduction and embryonic development through the functions of the KEAP1–NRF2 system.

Keywords: *Development, Embryos, Neonates, Oxidative stress, Reproduction, Biology*

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Gut analysis of small non-volant mammals of Mt. Makiling, Luzon Island, Philippines

Quibod, Ma. Niña Regina M. , de Guia, Anna Paul

Three non-native species (*Rattus exulans*, *R. tanezumi* and *Mus musculus*) of small non-volant mammals were recorded along various elevational gradients of Mount Makiling. Invertebrate remains and plant matter comprised the bulk of their diets based on the food items identified. The identified plant matter were leaves and seeds while invertebrates were easily identifiable through body parts such as legs, head and antennae. Other contents identified including vertebrate remains such as hair/fur, feathers and bones, plastics, rubber, stones, and intestinal worms were noted. Based on the calculated relative abundance of each food type, there is no significant difference in the diets of the three non-native rodent species. Preliminary results suggest that introduced rodents in Mt. Makiling have broad diets and there are no indications that their main diet includes native wildlife species. Traces of vertebrate remains, however, may indicate potential predation on wildlife species and further studies are needed to clarify this.

Keywords: *Rodents, Gut analysis, Endemic, Non-native, Elevational gradient, Biology*

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2014,
(Filipiniana Analytics)
NP

Improving the catalytic efficiency of thermostable *Geobacillus stearothermophilus* xylanase XT6 by single-amino acid substitution

Azouz, Rasha A. M. , Hegazy, Usama M. , Said, Mahmoud M. , Bassuiny, Roqaya I. , Salem, Ahmed M. , Fahmy, Afaf S.

Directed evolution using error-prone polymerase chain reaction was employed in the current study to enhance the catalytic efficiency of a thermostable *Geobacillus stearothermophilus* xylanase XT6 parent. High-throughput screening identified two variants with enhanced activity. Sequencing analysis revealed the presence of a single-amino acid substitution (P209L or V161L) in each variant. The maximum activity of mutant V161L and P209L was at 85°C and 70°C, respectively. Both mutants exhibited maximum activity at pH 7. The thermal and alkaline tolerance of mutant V161L only were markedly improved. The two mutants were more resistant to ethanol inhibition than the parent. Substrate specificity of the two mutants was shifted from beechwood xylan to birchwood xylan. The potential of the two mutants to hydrolyze rice straw and sugarcane bagasse increased. Both turnover number (kcat) and catalytic efficiency (kcat/kM) increased 12.2- and 5.7-folds for variant P209L and 13- and 6.5-folds for variant V161L, respectively, towards birchwood xylan. Based on the previously published crystal structure of extracellular *G. stearothermophilus* xylanase XT6, V161L and P209L mutation locate on $\beta\alpha$ -loops. Conformational changes of the respective loops could potentiate the loop swinging, product release and consequently result in enhancement of the catalytic performance.

Keywords: *Biotechnology, Enzyme, Genetic engineering, Lignocellulose, Structure-function relationship, Biology*

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The inquiry cycle and applied inquiry cycle: integrated frameworks for field studies in the environmental sciences

Feinsinger, Peter, Rodriguez, Iralys Ventosa, Izquierdo, Andrea E., Buzato, Silvana

Empirical place-based studies remain the research mode of most environmental field scientists. For their own sake and that of synthetic analyses based on them, such studies should follow rigorous, integrated frameworks for formulating, designing, executing, analyzing, interpreting, and reporting investigations. The inquiry cycle and applied inquiry cycle provide such frameworks: research questions complying with strict guidelines, research design following 17 detailed steps, and ordered sequences of reflections on data that begin with possible causes of their general tendencies and exceptions (outliers) and then consider possibilities involving other spatiotemporal scales. The applied inquiry cycle evaluates alternative place-based management guidelines. In these studies, reflection on results can lead to implementing the most promising alternative examined, monitoring the consequences, and engaging in adaptive management. The integration from start to finish and the numerous reality checks of the two frameworks provide field researchers with tools to carry out the best, or least flawed, field investigations possible.

Keywords: *Applied inquiry cycle, Biodiversity conservation, Ecology research frameworks, Field studies in the environmental sciences, Inquiry cycle, Biology*

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2020,
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Isoform-dependent subcellular localization of LMTK1A and LMTK1B and their roles in axon outgrowth and spine formation

Wei, Ran , Sugiyama, Arika , Sato, Yuta , Nozumi, Motohiro , Nishino, Hironori , Takahashi, Miyuki , Saito, Taro , Ando, Kanae , Fukuda, Mitsunori , Tomomura, Mineko , Igarashi, Michihiro , Hisanaga, Shin-ichi

Lemur kinase 1 (LMTK1) is a membrane-bound Ser/Thr kinase that is expressed in neurons. There are two splicing variants of LMTK1 with different membrane binding modes, viz., cytosolic LMTK1A that binds to membranes through palmitoylation at the N-terminal cysteines and LMTK1B, an integral membrane protein with transmembrane sequences. We recently reported that LMTK1A regulates axon outgrowth and spine formation in neurons. However, data about LMTK1B are scarce. We analysed the expression and cellular localization of LMTK1B along with its role in axon and spine formation. We found that both LMTK1B and LMTK1A were expressed equally in the cerebral cortex and cerebellum of the mouse brain. Similar to LMTK1A, the wild type of LMTK1B was localized to Rab11-positive pericentrosomal compartment. The kinase negative (kn) mutant of LMTK1B was found to be associated with an increase in the tubular form of endoplasmic reticulum (ER), which was not the case with LMTK1A kn. Furthermore, unlike LMTK1A kn, LMTK1B kn did not stimulate the axon outgrowth and spine formation. These results suggest that while LMTK1A and LMTK1B share a common function in recycling endosomal trafficking at the pericentrosomal compartment, LMTK1B has an additional unique function in vesicle transport in the ER region.

Keywords: *Axon outgrowth, Endoplasmic reticulum, Endosome trafficking, LMTK1, Rab, Biology*

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Isolation, identification and heavy metal biosorption assessment of yeast isolates indigenous to abandoned mine sites of Itogon Benguet, Philippines

Gutierrez, Bernard Jude M. , Borromeo, Cynthia C. , Barcelo, Joven R. , Tansengco, Myra L. , Coronado, Fe T. , Gacho, Carmel C.

Water samples collected from abandoned mining sites in Itogon, Benguet, Philippines were screened for metal resistant microorganisms, in particular yeasts that will be used to remove toxic metals such as Zn, Cu, Pb, Cr and Ni from aqueous media. Among the five yeast strains selected and five heavy metals tested, *Nodulisporium* sp. exhibited the highest removal efficiency of 80% and biosorption capacity of 56.7 mg g⁻¹ for Pb. This was based on the model equation for each metal that was generated to derive optimum response for removal efficiency. The metal accumulation potential for all selected yeast isolates was generally higher at the lower initial metal concentration of 25 mg L⁻¹, indicating rapid metal absorbing ability of the isolate and that adsorption sites in the biomass are taking up available metal ions more quickly. An increased removal capability was observed when the best isolate was applied in a semi-continuous treatment system thru an Aerobic Cascading Filter Bed Baffled Reactor (ACFBFR). The reactor design including the packing material remarkably enhanced the contact between the yeast biomass and Pb contaminated wastewater resulting in a much greater biosorption capacity of 170.14 mg g⁻¹ as compared to the biosorption of 56.7 mg g⁻¹ achieved during the batch adsorption experiment.

Keywords: *Metal resistant, Yeast isolate, Abandoned mine site, Itogon Benguet, ACFBFR, Biology*

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NP

The 'mitochondrial contact site and cristae organising system' (MICOS) in health and human disease

Eramo, Matthew J. , Lisnyak, Valerie , Formosa, Luke E. , Ryan, Michael T.

The 'mitochondrial contact site and cristae organising system' (MICOS) is an essential protein complex that promotes the formation, maintenance and stability of mitochondrial cristae. As such, loss of core MICOS components disrupts cristae structure and impairs mitochondrial function. Aberrant mitochondrial cristae morphology and diminished mitochondrial function is a pathological hallmark observed across many human diseases such as neurodegenerative conditions, obesity and diabetes mellitus, cardiomyopathy, and in muscular dystrophies and myopathies. While mitochondrial abnormalities are often an associated secondary effect to the pathological disease process, a direct role for the MICOS in health and human disease is emerging. This review describes the role of MICOS in the maintenance of mitochondrial architecture and summarizes both the direct and associated roles of the MICOS in human disease.

Keywords: *Cristae, Membrane organization, MICOS, Mitochondria, Biology*

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Microbial biofertilizers and soil amendments enhanced tree growth and survival in a barren mined-out area in Marinduque, Philippines

Aggangan, Nelly S., Anarna, Julieta A.

A bioremediation protocol was developed for rehabilitating mine tailing areas using microbial biofertilizers and soil amendments. The effects on the growth and survival of tree species in a three-decade barren mined-out area in Barangay Capayang, Mogpog, Marinduque, Philippines were also determined. Three concurrent field experiments were established in June 2016 using *Pterocarpus indicus*, *Acacia mangium* and *Eucalyptus urophylla*. Treatments for this study were uninoculated seedlings and seedlings inoculated with mycorrhiza (MYKORICH® for *P. indicus*) or Surigao isolate (for *A. mangium* and *E. urophylla*) with and without nitrogen-fixing bacteria. Aseptically germinated seedlings were inoculated when they were transplanted from seed boxes into individual polybags. After six months, the seedlings were planted in the mined-out area following Randomized Complete Block Design. The excavated soil were mixed with 1 kg vermicompost and 500 g lime before backfilling the 30 cm³ planting hole. After one month, 10 g NPK fertilizer and 5 g urea were applied on each seedling. Microbial-inoculated seedlings showed better growth performance with higher plant dry weight and microbial population compared to the uninoculated plants after 27 months. Hence, *P. indicus*, *A. mangium*, and *E. urophylla* inoculated with arbuscular mycorrhizal fungi and applied with lime, vermicompost, and basal inorganic fertilizer could be effective as reforestation species in barren mined-out areas.

Keywords: *Mine tailing, Bioremediation, P. indicus, Arbuscular mycorrhizal fungi, Nitrogen-fixing bacteria, Biology*

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Mitochondrial division, fusion and degradation
Murata, Daisuke , Arai, Kenta , Iijima, Miho , Sesaki, Hiromi

The mitochondrion is an essential organelle for a wide range of cellular processes, including energy production, metabolism, signal transduction and cell death. To execute these functions, mitochondria regulate their size, number, morphology and distribution in cells via mitochondrial division and fusion. In addition, mitochondrial division and fusion control the autophagic degradation of dysfunctional mitochondria to maintain a healthy population. Defects in these dynamic membrane processes are linked to many human diseases that include metabolic syndrome, myopathy and neurodegenerative disorders. In the last several years, our fundamental understanding of mitochondrial fusion, division and degradation has been significantly advanced by high resolution structural analyses, protein-lipid biochemistry, super resolution microscopy and in vivo analyses using animal models. Here, we summarize and discuss this exciting recent progress in the mechanism and function of mitochondrial division and fusion.

Keywords: *Actin, Dynamin-related GTPase, ER-mitochondria contact, Lipids, Mitophagy, Biology*

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Mitochondrial dynamics and interorganellar communication in the development and dysmorphism of mammalian oocytes
Udagawa, Osamu , Ishihara, Naotada

Mitochondria play many critical roles in cells, not only by supplying energy, but also by supplying metabolites, buffering Ca^{2+} levels and regulating apoptosis. During oocyte maturation and subsequent embryo development, mitochondria change their morphology by membrane fusion and fission, and coordinately undergo multiple cellular events with the endoplasmic reticulum (ER) closely apposed. Mitochondrial fusion and fission, known as mitochondrial dynamics, are regulated by family members of dynamin GTPases. Oocytes in animal models with these regulators artificially altered exhibit morphological abnormalities in nearby mitochondria and at the ER interface that are reminiscent of major cytoplasmic dysmorphisms in human assisted reproductive technology, in which a portion of mature oocytes retrieved from patients contain cytoplasmic dysmorphisms associated with mitochondria and ER abnormal morphologies. Understanding organelle morpho-homeostasis in oocytes obtained from animal models will contribute to the development of novel methods for determining oocyte health and for how to deal with dysmorphic oocytes.

Keywords: *Cytoplasmic dysmorphisms, Dynamin-related GTPase, Mitochondrial fission and fusion, Oocyte maturation, Organelle morphology, Biology*

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Mitochondrial nucleoid morphology and respiratory function are altered in Drp1-deficient HeLa cells

Ota, Azusa , Ishihara, Takaya , Ishihara, Naotada

Mitochondria are dynamic organelles that frequently divide and fuse with each other. The dynamin-related GTPase protein Drp1 has a key role in mitochondrial fission. To analyse the physiological roles of Drp1 in cultured human cells, we analysed Drp1-deficient HeLa cells established by genome editing using CRISPR/Cas9. Under fluorescent microscopy, not only mitochondria were elongated but their DNA (mtDNA) nucleoids were extremely enlarged in bulb-like mitochondrial structures ('mito-bulbs') in the Drp1-deficient HeLa cells. We further found that respiratory activity, as measured by oxygen consumption rates, was severely repressed in Drp1-deficient HeLa cells and that this was reversible by the co-repression of mitochondrial fusion factors. Although mtDNA copy number was not affected, several respiratory subunits were repressed in Drp1-deficient HeLa cells. These results suggest that mitochondrial fission is required for the maintenance of active respiratory activity and the morphology of mtDNA nucleoids in human cells.

Keywords: *GTPase, Membrane dynamics, Mitochondria, mtDNA, Respiratory complex, Biology*

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Molecular identification of the Chinese pond mussel *Sinanodonta woodiana* (Lea, 1834) from Mindoro and Leyte Islands, Philippines

Fornillos, Raffy Jay C.

The Chinese pond mussel *Sinanodonta woodiana* (Lea, 1834) is a large freshwater bivalve species of the family Unionidae and a known invasive alien species. Proper verification of its identity as well as its source population is crucial for the control of its spread. However, its high plastic shell morphology that resembles other non-invasive species of unionids can be an obstacle. The distribution and ecological impact of this invasive unionid is not fully understood and should be further investigated to prevent further spread in the Philippines. In this study, we used the cytochrome oxidase I (*cox1*) gene to verify the identity of putative *S. woodiana* samples collected from Bato Creek in Oriental Mindoro and Lake Danao in Leyte, Philippines and elucidate their source populations. Eighteen cytochrome oxidase subunit I (*cox1*) barcodes were generated from samples collected from Lake Danao, Leyte (n=13) and Bato Creek, Oriental Mindoro (n=5). These barcodes were subjected to Basic Local Alignment Search Tool (BLAST) analysis, which showed that the *cox1* sequences from the Philippine samples matched with those of *S. woodiana* (>94%) found in GenBank. The sequences were then aligned with *cox1* sequences of *S. woodiana* and other unionid representatives from GenBank. Phylogenetic and haplotype network analyses also showed three haplotypes (Hap 1, 2, and 4) of *S. woodiana* samples from Lake Danao and Bato Creek. Hap 1 and 2 are distinct haplotypes observed in Lake Danao samples while Hap 4 is shared between Lake Danao and Bato Creek samples and have clustered with conspecific specimens from Malaysia and Indonesia, suggesting their potential Island Southeast Asian origin.

Keywords: *idae, DNA barcoding, Invasive Alien Species, Sinanodonta woodiana, Biology*

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Old but not obsolete: an enhanced high-speed immunoblot

Higashi, Sayuri L , Yagyu, Kazuya , Nagase, Haruna , Pearson, Craig S , Geller, Herbert M , Katagiri, Yasuhiro

The immunoblotting technique (also known as western blotting) is an essential tool used in biomedical research to determine the relative size and abundance of specific proteins and protein modifications. However, long incubation times severely limit its throughput. We have devised a system that improves antigen binding by cyclic draining and replenishing (CDR) of the antibody solution in conjunction with an immunoreaction enhancing agent. Biochemical analyses revealed that the CDR method reduced the incubation time of the antibodies, and the presence of a commercial immunoreaction enhancing agent altered the affinity of the antibody, respectively. Combination of the CDR method with the immunoreaction enhancing agent considerably enhanced the output signal and further reduced the incubation time of the antibodies. The resulting high-speed immunoblot can be completed in 20 min without any loss in sensitivity. Further, the antibodies are fully reusable. This method is effective for both chemiluminescence and fluorescence detection. Widespread adoption of this technique could dramatically boost efficiency and productivity across the life sciences.

Keywords: *Chemiluminescence, Fluorescence, Immunoblot, Immunoreaction enhancing agent, Western blot, Biology*

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Persulphide-responsive transcriptional regulation and metabolism in bacteria

Shimizu, Takayuki , Masuda, Shinji

Hydrogen sulphide (H₂S) impacts on bacterial growth both positively and negatively; it is utilized as an electron donor for photosynthesis and respiration, and it inactivates terminal oxidases and iron-sulphur clusters. Therefore, bacteria have evolved H₂S-responsive detoxification mechanisms for survival. Sulphur assimilation in bacteria has been well studied, and sulphide:quinone oxidoreductase, persulphide dioxygenase, rhodanese and sulphite oxidase were reported as major sulphide-oxidizing enzymes of sulphide assimilation and detoxification pathways. However, how bacteria sense sulphide availability to control H₂S and sulphide metabolism remains largely unknown. Recent studies have identified several bacterial (per)sulphide-sensitive transcription factors that change DNA-binding affinity through persulphidation of specific cysteine residues in response to highly reactive sulphur-containing chemicals and reactive sulphur species (RSS). This review focuses on current understanding of the persulphide-responsive transcription factors and RSS metabolism regulated by RSS sensory proteins.

Keywords: *Bacterial transcription, Cysteine modification, Persulphide, Reactive sulphur species, Sulphur transfer, Biology*

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Potential of gamma-irradiation in increasing the pectin yield from mango (*Mangifera indica*) peels

Mariano, Rico Antonio S, Valdez, Eliniel

The aim of this novel study is to find out if gamma-irradiation can increase the pectin yield of dried mango (carabao variety) peels once exposed to different doses as compared to non-irradiated mango peels. At the same time the utilization of mango peels as a source of pectin can harness the bioeconomy of this agricultural waste. The samples were prepared from four sets of ripe mango at 1 kilogram per set. Results showed that the dried mango peel of non-irradiated mango is 40 grams and 2 grams of pectin was extracted (5% yield). The next set was irradiated by 1 kGy (kiloGrey) and the 20 grams peel resulted to 2 grams of pectin (10% yield). When 25 grams of peel was exposed to 2 kGy, it gave 2.5 grams of pectin (10% yield). The highest weight of pectin was recorded when 25 grams of peel was exposed to 3.0 kGy that yielded 2.9 grams of pectin (11.6% yield). This study proved that exposing the mango to a certain dose of radiation, the pectin content of its dried peels can be significantly higher as compared to non-irradiated peels thus, can be an alternative to apple and citrus fruits as source of pectin. The result of this study has the potential to reduce and utilize such agricultural waste that can make mango exporting countries self-sufficient with respect to their pectin needs and can translate into significant dollar savings and create more jobs.

Keywords: *Bio-economy, Carabao mango peel, Gamma-irradiation, kiloGrey, Pectin, Biology*

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Redox regulation of tyrosine kinase signalling: more than meets the eye

Dustin, Christopher M, Heppner, David E, Lin, Miao-Chong J, der Vliet, Albert van

Protein kinases are essential mediators of cellular signal transduction and are often dysregulated in disease. Among these, protein tyrosine kinases (PTKs) have received specific interest due to their common roles in various diseases including cancer, and emerging observations indicating that PTK signalling pathways are susceptible to regulation by reactive oxygen species (ROS), which are also frequently implicated in disease pathology. While it is well recognized that ROS can impact on tyrosine kinase signalling by inhibiting tyrosine phosphatases, more recent studies highlight additional modes of redox-based regulation of tyrosine kinase signalling by direct redox modification of non-catalytic cysteines within tyrosine kinases or other protein components of this signalling pathway. In this review, we will present recent advancements with respect to redox-based mechanisms in regulating PTK signalling, with a specific focus on recent studies demonstrating direct redox regulation of Src-family kinases and epidermal growth factor receptor kinases. Importantly, redox-based modulation of tyrosine kinases may be relevant for many other kinases and has implications for current approaches to develop pharmacological inhibitors for these proteins.

Keywords: *Redox, Cysteine, Src, EGFR, NOX, Biology*

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A river health status model based on water quality, macroinvertebrates and land use for Niyugan River, Cabuyao City, Laguna, Philippines

Zafaralla, Macrina T. , Tan, Maria Francesca O. , Magcale-Macandog, Damasa , Baltazar, Dalton Erick Suyosa, Cadiz, Nina M.

A health status model was developed for Niyugan River. It consists of two component parameters: response and pressure. The response parameters, water quality and Ephemeroptera-Plecoptera-Trichoptera (EPT) proportion measure the current state of the river. Pressure parameters, land use, infrastructure, and riparian vegetation proportion represent the factors that can worsen the current river condition. Water quality indicator values were determined using on-site measurements and analyzed water. Benthic macroinvertebrates were collected from all the sampling sites. Land use, infrastructure, and riparian vegetation proportions were derived from a map created using Arcmap10. For efficient parameter input and sensitivity analysis, a calculator-like interface was developed using Stella. The score resulted to 37.07, corresponding to a “poor” health. Sensitivity analyses showed that the health score is influenced at a greater extent, by the combination of water quality indicators rather than the number of water quality indicators in the model and by the magnitude of separate indicators within a parameter category. It is suggested that the model is evaluated using data sets from other rivers to further investigate its sensitivity. This model can serve as a basis for developing more dynamic river health models for the Philippines.

Keywords: *River health, Model, Niyugan River, EPT richness, Water quality, Land use, Stella, Biology*

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2016,
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Selenoprotein P as a significant regulator of pancreatic β cell function

Saito, Yoshiro

Selenoprotein P (SeP; encoded by SELENOP) is selenium (Se)-rich plasma protein that is mainly produced in the liver. SeP functions as a Se-transport protein to deliver Se from the liver to other tissues, such as the brain and testis. The protein plays a pivotal role in Se metabolism and antioxidative defense, and it has been identified as a ‘hepatokine’ that causes insulin resistance in type 2 diabetes. SeP levels are increased in type 2 diabetes patients, and excess SeP impairs insulin signalling, promoting insulin resistance. Furthermore, increased levels of SeP disturb the functioning of pancreatic β cells and inhibit insulin secretion. This review focuses on the biological function of SeP and the molecular mechanisms associated with the adverse effects of excess SeP on pancreatic β cells’ function, particularly with respect to redox reactions. Interactions between the liver and pancreas are also discussed.

Keywords: *Hepatokine, Insulin secretion, Pancreatic#946, Cell, Selenium, Selenoprotein P, Biology*

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Spatial distribution of some toxic metals in topsoil and bioaccumulation in wild flora around a metal scrap factory: a case of Southwestern Nigeria

Fatoba, Paul O. , Varun, Mayank , Olushola, Oluwatosin E. , Ogunkunle, Clem

There is increasing metal pollution in soil due to the spate of industrialization in developing countries. It is premised on this scenario that the topsoil around a metal scrap factory was studied to assess the spatial distribution of metal and resultant mobility in native flora. Concentrations of Cd, Zn, Pb and Fe in samples of topsoil and plants were determined by Atomic Absorption Spectrophotometry. Spatial modelling of metals was carried out using the Inverse Distance Weighted (IDW) technique of ArcGIS. Also, metal mobility in native flora was assessed by the transfer factor model. The analysis showed high levels of Cd, Zn, Fe and Pb that were beyond natural concentrations. Spatial mapping of the concentrations indicated that the immediate north and south of the factory were significantly polluted by Cd, Zn and Pb while Fe presence in the area was partially geogenic. The level of Cd, Zn and Pb in the three native species exceeded permissible limits whereas only Cd showed great mobility within the biomass of the three species. The mobility of Cd in the diagnostic species is an indication of possible potential health risk from Cd toxicity through plants ingestion. It is therefore important that measures should be geared towards improving the pollution control system of the factory to stem down the rate of contamination of soil.

Keywords: *Heavy metal, Spatial distribution,, Metal mobility, Metal accumulation, Biology*

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2017,
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NP

Status of mammals in the expansion sites of the Mt. Hamiguitan Range Wildlife Sanctuary, Mindanao, Philippines

Laraga, Socorro H. , Noel E. Lagunday, Kim Lee B. Domingo, Ruel D. Colong, Roy G. Ponce, , Amoroso, Victor B., Mohagan, Alma B. , Coritico, Fulgent

Mt. Hamiguitan Range Wildlife Sanctuary is one of the biodiversity hotspots in the Mindanao faunal region, which is home to about 21 species of mammals. This study provides data on mammal assemblage and assessment on the added value of the ca. 2.99 km² MHRWS expansion sites to the already protected zone. Faunistic inventory and assessment documented 19 species of mammals belonging to 16 genera, eight families and five orders. This adds nine species to the previously reported mammals of Mt. Hamiguitan range making it a home to 30 species. Relatively low diversity of mammals ($H' = 0.615$) in the expansion sites is attributed to poor soil resulting to low forest productivity and habitat loss due to mining, logging and shifting cultivation. This unique assemblage of vulnerable and endemic species of bats and mammals in Mt. Hamiguitan Range Wildlife Sanctuary expansion sites calls for more sampling effort and conservation strategies to maintain its bat and mammal assemblage.

Keywords: *Biodiversity, Species composition, Diversity index, Similarity index, Threatened and endemic species, Biology*

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Survival, growth and Cu accumulation by non-mycorrhizal and mycorrhizal *Jatropha curcas* L. seedlings or cuttings in a grassland and in mine tailing soils

Ragragio, Elena M. , Kasahara, Erena S. , Albano, Aina B. , Aggangan, Nelly S.

Jatropha curcas has been identified as an alternate source for biofuel, and thus requires immediate establishment of plantations in areas not utilized for food production such as in mine tailings sites. Screenhouse experiments were conducted to determine the survival, growth and copper (Cu) accumulation of non-mycorrhizal or mycorrhizal *J. curcas* seedlings or cuttings grown in oven sterilized grassland soil from Caliraya, Laguna and in mine tailing soils from Paracale, Camarines Norte and Mogpog, Marinduque. Grassland soil was sterilized in an oven for three days at 100°C prior to use. Seedlings or cuttings were either uninoculated or inoculated with Mykovam or MineVAM mycorrhizal inoculants. Results show that Paracale soil supported the highest survival and best growth of seedlings or cuttings. In Mogpog soil, all seedlings died before two months except those inoculated with Mykovam while all cuttings died on the third month. Non-mycorrhizal seedlings did not survive in Caliraya soil while mycorrhizal inoculation increased seedling survival and growth. Cuttings did not respond to inoculation, probably due to low mycorrhizal infection ($\leq 14\%$) as compared to seedlings ($\leq 100\%$). Mykovam promoted higher survival and better plant growth than MineVAM because of its higher root colonization. Cu accumulation was higher in the roots of mycorrhizal plants and the lowest was in the leaves especially in the Mykovam-inoculated plants. In conclusion, Mykovam inoculated *J. curcas* grew better with higher survival rate than the control thus this implies that rehabilitation of grasslands in Caliraya, Laguna and mine tailing areas in Paracale, Camarines Norte can be done for its potential for biofuel production. However, field trials should be conducted.

Keywords: *Arbuscular mycorrhizal fungi, Nutrient deficient soil, Heavy metal accumulation, Biology*

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2013,
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NP

Terrestrial arthropod profile and soil microbial population dynamics on cabbage cropping as affected by application of *Trichoderma* microbial inoculant (TMI) in Quezon, Sariaya, Philippines

Cocjin, III, Gideon T. , Cuevas, Virginia C. , Caasi-Lit, Merdelyn T. , Zarate, Joce

A two-season study was conducted in a cabbage farmer's field in Sariaya, Quezon Province, Philippines to determine the impact of *Trichoderma* microbial inoculant (TMI) application on above-ground terrestrial arthropod profile. Soil microflora population dynamics, soil chemical properties, the nitrogen and phosphate crop uptake, and disease incidence were monitored for the first season only. TMI treatment was compared with farmer's practice (FP, control) that involved insecticide treatment following an RCBD with three replicates. Target organisms were simultaneously monitored at 40, 60 and 85 days after transplanting (DAT). This is the first report on simultaneously studying these components of the cabbage agroecosystem. Combined seasons' data showed higher arthropod counts in TMI plots, with predators significantly higher at third sampling-first season and parasite population first sampling second season. Insect damage was observed on all plants indicating herbivore infestation, despite insecticide spraying in FP. Marketable yield was significantly greater in TMI plots based on combined seasons' data. *Trichoderma* invaded cabbage roots and existed as an endophyte throughout the life of the crop. It also significantly reduced disease incidence, increased N uptake despite reduced fertilizer application compared with FP. No change in culturable bacterial and fungal population was observed except for a transient increase in fungal population following TMI application. Further testing on other crucifers should be done to determine their reaction against major insect pests and on functional microbial groups.

Keywords: *Trichoderma microbial inoculant, Arthropod profile, Cabbage, Bacterial and fungal population dynamics, Biology*

Towards global volunteer monitoring of odonate abundance

Bried, Jason, Ries, Leslie, Smith, Brenda, Patten, Michael, Abbott, John, Ball-Damerow, Joan, Cannings, Robert, Cordero-Rivera, Adolfo, Cordoba-Aguilar, Alex, De Marco, Jr., Paulo, Dijkstra, Klaas-Douwe, Dolny, Ales, Grunsven, Roy Van, Halstead, David, Harabis, Filip, Hassall, Christopher, Jeanmougin, Martin, Jones, Colin, Juen, Leandro, Kalkman, Vincent, Kietzka, Gabriella, Mazzacano, Celeste Searles, Orr, Albert, Perron, Mary Ann, Rocha-Ortega, Maya, Sahlen, Goran, Samways, Michael, Siepielski, Adam, Simaika, John, Suhling, Frank, Underhill, Les, White, Erin

Insects are reportedly experiencing widespread declines, but we generally have sparse data on their abundance. Correcting this shortfall will take more effort than professional entomologists alone can manage. Volunteer nature enthusiasts can greatly help to monitor the abundance of dragonflies and damselflies (Odonata), iconic freshwater sentinels and one of the few nonpollinator insect groups appreciated by the public and amenable to citizen science. Although counting individual odonates is common in some locations, current data will not enable a global perspective on odonate abundance patterns and trends. Borrowing insight from butterfly monitoring efforts, we outline basic plans for a global volunteer network to count odonates, including organizational structure, advertising and recruiting, and data collection, submission, and synthesis. We hope our proposal serves as a catalyst for richer coordinated efforts to understand population trends of odonates and other insects in the Anthropocene.

Keywords: *Citizen Science, Community science, Odonata, Insect declines, Prestonian shortfall, Biology*

Undergraduate Biology instructors still use mostly teacher-centered discourse even when teaching with active learning strategies

Kranzfelder, Petra , Bankers-Fulbright, Jennifer L., Garcia-Ojeda, Marcos E. , Melloy, Marin , Mohammed, Sagal , Warfa, Abdi-Rizak M

Reform efforts in undergraduate science, technology, engineering, and mathematics (STEM) instruction often emphasize student-centered teaching approaches, but relatively little attention is paid to the way STEM teachers use discourse when interacting with their students. In the present study, we examined the instructional and discourse behaviors of biology faculty members (N = 20) teaching in undergraduate biology classes. Although we found that the biology teachers spent most of their time guiding student learning in active learning activities and less time presenting, an analysis of their classroom communicative approaches showed that the participants mostly used authoritative and not dialogic discourse to teach biology content. Similarly, we found a strong positive correlation between biology teachers guiding student learning and authoritative, interactive approaches, suggesting that these teachers mostly asked the students to recall facts or basic concepts rather than asking them to collaboratively build knowledge. We describe the implications of these findings and our results for undergraduate biology instruction.

Keywords: *Discourse analysis, Classroom talk moves, Dialogic discourse, College, Active learning strategies, Biology*

A unique mechanism for thiolation of serum albumins by disulphide molecules *Nakashima, Fumie*

Protein S-thiolation is a reversible oxidative modification that serves as an oxidative regulatory mechanism for certain enzymes and binding proteins with reactive cysteine residues. It is generally believed that the thiolation occurs at free sulphhydryl group of cysteine residues. Meanwhile, despite the fact that disulphide linkages, serving structural and energetic roles in proteins, are stable and inert to oxidative modification, a recent study shows that the thiolation could also occur at protein disulphide linkages when human serum albumin (HSA) was treated with disulphide molecules, such as cystine and homocystine. A chain reaction mechanism has been proposed for the thiolation at disulphide linkages, in which free cysteine (Cys34) is involved in the reaction with disulphide molecules to form free thiols (cysteine or homocysteine) that further react with protein disulphide linkages to form the thiolated cysteine residues in the protein. This review focuses on the recent finding of this unique chain reaction mechanism of protein thiolation.

Keywords: *Disulphide molecule, Protein thiolation, Serum albumin, Biology*

Using the responses of green algae *Spirogyra* as bioindicator for metals and pesticides pollution

Han, Lim Jun , Shing, Wong Ling, Yi, Kiew Wen , Hwang, Tan Yeong , Hock, Ong Ghi

Metals and pesticides are common environmental pollutants. The presence of these pollutants in the environment need to be closely monitored because of its toxicity effects to human beings. In this study, the responses of *Spirogyra* in the form of changes in chlorophyll content due to the exposure to these pollutants were reported. The algae was collected from natural environment, immobilized with agarose gel, and then being exposed to lead (Pb), aluminium (Al), calcium (Ca), sodium (Na), atrazine and 2,4-dichlorophenoxyacetic acid (2,4-D). The changes of chlorophyll in the algae were measured for 48 hours using a spectrophotometer at 663 nm and 450 nm respectively. The content of the pigment was changed due to the presence of the pollutants at concentrations of 0.001 mg L⁻¹ to 1.000 mg L⁻¹. The change might due to the biochemical reactions triggered by the pollutants. The response could potentially be used as whole cell bioindicator for the detection of the presence of metals and pesticides.

Keywords: *Spirogyra, Metals, Pesticides, Bioindicator, Algae, Biology*

X-ray dose-dependent structural changes of the [2Fe-2S] ferredoxin from *Chlamydomonas reinhardtii*

*Ohnishi, Yusuke , Muraki, Norifumi , Kiyota, Daiki , Okumura, Hideo , Baba, Seiki , Kawano, Yoshiaki
, Kumasaka, Takashi , Tanaka, Hideaki , Kurisu, Genji*

Plant-type ferredoxin (Fd) is an electron transfer protein in chloroplast. Redox-dependent structural change of Fd controls its association with and dissociation from Fd-dependent enzymes. Among many X-ray structures of oxidized Fd have been reported so far, very likely a given number of them was partially reduced by strong X-ray. To understand the precise structural change between reduced and oxidized Fd, it is important to know whether the crystals of oxidized Fd may or may not be reduced during the X-ray experiment. We prepared the thin plate-shaped Fd crystals from *Chlamydomonas reinhardtii* and monitored its absorption spectra during experiment. Absorption spectra of oxidized Fd crystals were clearly changed to that of reduced form in an X-ray dose-dependent manner. In another independent experiment, the X-ray diffraction images obtained from different parts of one single crystal were sorted and merged to form two datasets with low and high X-ray doses. An Fo–Fo map calculated from the two datasets showed that X-ray reduction causes a small displacement of the iron atoms in the [2Fe-2S] cluster. Both our spectroscopic and crystallographic studies confirm X-ray dose-dependent reduction of Fd, and suggest a structural basis for its initial reduction step especially in the core of the cluster.

Keywords: *Absorption spectroscopy, Ferredoxin, Protein–protein interaction,, Redox-dependent structural change, X-ray crystallography, Biology*

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BOTANY

Bringing botany into focus: addressing plant blindness in undergraduates through an immersive botanical experience

*Colon, Jessica , Tiernan, Nichole, Oliphant, Simone, Shirajee, Ateev, Flickinger, Jonathan, Liu,
Hong, Francisco-Ortega, Javier, McCartney, Melissa*

Undergraduate science, technology, engineering, and math students (STEM) are usually not attuned to the intricacies of plant life histories or to the dynamic role plants play in ecosystems and human society, a phenomenon termed plant blindness. Botany education has declined in the past decades, whereas career paths that need and benefit from a workforce with botanical knowledge have increased. Consequently, there is a need to reduce plant blindness among undergraduate students, regardless of their career trajectories. We provide evidence that participation in a botanical experience as part of a general biology course can positively shift undergraduates' perception of botany, the study of plants. Students participating in the botanical experience showed significant positive shifts in their ability to connect botany to their college major and future careers. In addition, we show qualitative data indicating a new respect for plants and a new appreciation for the diversity among plants.

Keywords: *Zoochauvinism, Immersive learning, Botanical garden, Undergraduate STEM education, Botanical education, Botany*

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Attenuation of methylene blue from aqua-media on acid activated montmorillonite of Nigerian origin

Okagu, Ogadimma D. , Alum, Ogechi L. , Alumona, Theresa N. , Onoabedje, Efeturi A. , Akpomie, Kovo G., Ezeofor, Chidinma

This study evaluated the performance of an Unmodified Ugwuoba-montmorillonite Clay (UUC) and the Acid Modified Ugwuoba-montmorillonite Clay (AMUC) of Nigerian origin as low-cost materials for attenuation of Methylene Blue (MB). Batch sorption methodology was applied in adsorption and desorption studies. AMUC was found to have higher adsorption of MB than UUC under all experimental conditions. Optimum experimental conditions were achieved at pH 8.0, adsorbent particle size 100 μ m, MB concentration 200 mg/L and contact time of 60 and 90 min for AMUC and UUC, respectively. Equilibrium isotherm analysis was performed by the application of the Langmuir, Freundlich, Flory-Huggins, Tempkin, Dubinin-Radushkevich and Scatchard isotherm models. The Langmuir isotherm was found to be applicable (R^2 of 0.999) in the sorption of MB on UUC while the Freundlich gave the best fit (R^2 of 0.990) for AMUC. Kinetic analysis was evaluated by the Pseudo First Order (PFO), Pseudo Second Order (PSO), Elovich, Bangham, Intraparticle diffusion and liquid film diffusion models. The PSO model was found to be applicable in the kinetics with an initial sorption rate of 0.647 and 1.477mg g⁻¹ min⁻¹ for the respective adsorbents. Thermodynamics revealed a spontaneous, feasible and exothermic adsorption process, while desorption studies showed a physical adsorption mechanism.

Keywords: Acid-modification, Desorption, Dye, Thermodynamics, Water treatment, Chemistry

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Circ_0000218 plays a carcinogenic role in colorectal cancer progression by regulating miR-139-3p/RAB1A axis

Pei, Fu-Lai , Cao, Ming-Zheng , Li, Yue-Feng

Accumulating researches have confirmed that circRNA abnormal expression plays a prominent role in the progression of colorectal cancer (CRC). The role of circ_0000218 in CRC and its potential mechanism are not clear. In this study, real-time polymerase chain reaction (RT-PCR) was employed to measure the circ_0000218, miR-139-3p and RAB1A mRNA expression in CRC tissues and cells. Immunohistochemistry and western blot were conducted to determine the RAB1A expression in CRC tissues and cells, respectively. Colony formation assay and BrdU method were employed to monitor the effect of circ_0000218 on cell proliferation. Transwell assay was adopted to detect cell migration and invasion. Dual luciferase reporter assay and RNA immunoprecipitation assay were adopted to confirm the targeting relationship between circ_0000218 and miR-139-3p, miR-139-3p and RAB1A. We demonstrated that circ_0000218 was notably upregulated in CRC tissues and cell lines, and its high expression level was markedly linked to the increase of T staging and local lymph node metastasis. Circ_0000218 overexpression enhanced the proliferation and metastasis of CRC cells while knocking down circ_0000218 caused the opposite effects. We also observed that miR-139-3p was negatively regulated by circ_0000218, while RAB1A was positively regulated by it. Collectively, this study suggested that circ_0000218 upregulated RAB1A and promoted CRC proliferation and metastasis via sponging miR-139-3p.

Keywords: Deuterium, Circ_0000218, CRC, miR-139-3p, RAB1A, Chemistry

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Comparison of Spectrophotometric and Digital Photometric Methods for Determining Chemical Oxygen Demand

del Rosario, Ernesto J. , Mallari, Rhea DC., Micor, Jose Rene

Visible spectrophotometry (VS) and digital photometry (DP) for determining chemical oxygen demand (COD) were compared; the latter method involved image processing of digital photographs of analyte solutions using RGB-AIC software. Statistical analysis showed that COD values of untreated and treated (trickling filter) wastewater samples from a hog slaughterhouse were not significantly different using VS and DP methods. The COD values were not significantly different among the treated samples as well using a^* and L^* plots. Tests for accuracy and repeatability of the DP method showed acceptable results. The calculated limit of detection (LOD) for DP was 0.73 mg L^{-1} while the LOD for VS was 0.33 mg L^{-1} . The accuracy of the DP method was validated using glucose solutions of known COD values; t-tests performed at 95% confidence level showed no significant differences in COD values between (1) theory and experiment, (2) VS and DP and (3) a^* and L^* plots. These findings suggest that digital photometry is accurate and can be used as an equally accurate alternative to conventional spectrophotometry.

Keywords: *Chemical oxygen demand, Digital photometry, Image processing, Visible spectrophotometry, Slaughterhouse wastewater, Chemistry*

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CRY2 suppresses trophoblast migration and invasion in recurrent spontaneous abortion

Wu, Lianzhi , Cheng, Biheng , Liu, Qian , Jiang, Ping , Yang, Jing

Disruption of circadian rhythms is associated with aberrant trophoblast migration and invasion in recurrent spontaneous abortion (RSA). This study aims to explore the functional role and the mechanisms of cryptochrome 2 (CRY2), a fundamental component of the circadian clock, in regulating trophoblast migration and invasion. Human extravillous trophoblast cell line HTR-8/SVneo was used as a cell model. Cell migration and invasion were examined using wound healing assay and Transwell assay, respectively. The mRNA and protein levels were determined using quantitative real-time polymerase chain reaction and western blot, respectively. Luciferase reporter assay and chromatin immunoprecipitation assay were performed to explore the interaction between c-Myc to the brain and muscle ARNT-like protein 1 (BMAL1) promoter. CRY2 was highly expressed in human villous specimens of RSA. Furthermore, CRY2 overexpression impaired migration and invasion in HTR-8/SVneo cells, whereas CRY2 knockdown yielded the opposite results. Mechanistically, c-Myc bound to the BMAL1 promoter and induced BMAL1 transcription, both of which further activated matrix metalloproteinase 2/9 (MMP2/9) and facilitated migration and invasion in HTR-8/SVneo cells. CRY2 inhibited c-Myc-BMAL1 pathway and impaired migration and invasion of HTR-8/SVneo cells. Collectively, these findings demonstrate that CRY2 suppresses trophoblast migration and invasion via inhibiting c-Myc-BMAL1-MMP2/9 pathway.

Keywords: *BMAL1, c-Myc, CRY2, Recurrent spontaneous abortion, Trophoblast, Chemistry*

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Crystal structure of the complex of the interaction domains of *Escherichia coli* DnaB helicase and DnaC helicase loader: structural basis implying a distortion-accumulation mechanism for the DnaB ring opening caused by DnaC binding

Nagata, Koji , Okada, Akitoshi , Ohtsuka, Jun , Ohkuri, Takatoshi , Akama, Yusuke , Sakiyama, Yukari , Miyazaki, Erika , Horita, Shoichiro , Katayama, Tsutomu , Ueda, Tadashi , Tanokura, Masaru

Loading the bacterial replicative helicase DnaB onto DNA requires a specific loader protein, DnaC/DnaI, which creates the loading-competent state by opening the DnaB hexameric ring. To understand the molecular mechanism by which DnaC/DnaI opens the DnaB ring, we solved 3.1-Å co-crystal structure of the interaction domains of *Escherichia coli* DnaB–DnaC. The structure reveals that one N-terminal domain (NTD) of DnaC interacts with both the linker helix of a DnaB molecule and the C-terminal domain (CTD) of the adjacent DnaB molecule by forming a three α -helix bundle, which fixes the relative orientation of the two adjacent DnaB CTDs. The importance of the intermolecular interface in the crystal structure was supported by the mutational data of DnaB and DnaC. Based on the crystal structure and other available information on DnaB–DnaC structures, we constructed a molecular model of the hexameric DnaB CTDs bound by six DnaC NTDs. This model suggested that the binding of a DnaC would cause a distortion in the hexameric ring of DnaB. This distortion of the DnaB ring might accumulate by the binding of up to six DnaC molecules, resulting in the DnaB ring to open.

Keywords: *Crystal structure, Distortion-accumulation mechanism, DnaB helicase, DnaC helicase loader, Helicase ring opening, Chemistry*

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Degradation of aniline by bismuth oxyiodide (BiOI) under visible light irradiation *Yan, Qi-She*

Visible-light-driven porous spherical photocatalyst bismuth oxyiodide (BiOI) was successfully prepared by facial hydrothermal synthesis. The obtained catalyst was characterized using x-ray diffraction (XRD), ultraviolet-visible diffuse reflection (UV-Vis DRS) and scanning electron microscope (SEM). The experiment which used the visible-driven catalyst to degrade aniline wastewater investigated the effects of initial concentration of aniline and reaction time on the removal efficiency of aniline. The highest photodegradation efficiency of aniline was 97.3% with a BiOI dosage of 1 g L⁻¹ and initial aniline concentration of 50 mg L⁻¹ after 2 h of visible light irradiation. The chemical oxygen demand (COD) of the solution decreased substantially and the high chemical oxygen demand removal efficiency achieved 71%. In addition, the investigation of different scavengers demonstrated that h⁺ and •O₂⁻ are the main reactive species in the photodegradation of aniline. The fate of nitrogen was investigated by ion chromatography. The high photodegradation and mineralization capability efficiency suggest BiOI is a promising photocatalyst for the degradation of organic pollution in the practical application.

Keywords: *BiOI, Aniline, Visible-light, Photocatalytic degradation, Hydrothermal synthesis, Chemistry*

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Effect of redox imbalance on protein modifications in lymphocytes of psoriatic patients

Wójcik, Piotr , Gęgotek, Agnieszka , Wroński, Adam , Jastrząb, Anna , Żebrowska, Agnieszka

Lymphocytes are one of the most important cells involved in the pathophysiology of psoriasis; therefore, the aim of this study was to assess the redox imbalance and protein modifications in the lymphocytes of patients with psoriasis vulgaris (PsV) or psoriatic arthritis (PsA). The results show a stronger shift in redox status to pro-oxidative conditions (observed as an increased reactive oxygen species level, a decrease in catalase activity and lower levels of glutathione peroxidase and vitamin E compared with healthy controls) in the lymphocytes of PsA than PsV patients. It is also favoured by the enhanced level of activators of the Nrf2 transcription factor in lymphocytes of PsV compared with decreased of these proteins level in PsA. Moreover, the differential modifications of proteins by lipid peroxidation products 4-oxononenal (mainly binding proteins) and malondialdehyde (mainly catalytic proteins with redox activity), promoted a pro-apoptotic pathway in lymphocytes of PsV, which was manifested by enhanced expression of pro-apoptotic caspases, particularly caspase 3. Taken together, differences in Nrf2 pathway activation may be responsible for the differential level of redox imbalance in lymphocytes of patients with PsV and PsA. This finding may enable identification of a targeted therapy to modify the metabolic pathways disturbed in psoriasis.

Keywords: *Apoptosis, Lymphocytes, Protein modifications, Psoriasis, Redox balance, Chemistry*

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Effect of thermal treatment on the disinfection of infectious waste by fry-drying method using vegetable oil

Capunitan, Jewel A. , Bambase, Jr., Manolito E. , Dorado, Moises A. , Demafelis, Rex B. , Mercado, Susana M. , Movillon, Jovita L. , Bautista, Ramer P.

Healthcare waste must be managed properly due to the hazards they impose on public health and the environment. In this study, an alternative method of treating infectious waste via thermal treatment using coconut oil was investigated in a laboratory-scale setup. The effects of oil temperature (121°C, 145°C and 170°C) and treatment time (10, 20 and 30 minutes) on bacterial growth and properties of simulated infectious wastes contaminated with *Bacillus subtilis* were determined. No bacterial growth was observed in the samples even at the seventh day after treatment using 145°C (20- and 30-minute treatment time) and 170°C (all treatment time). However, growth on enriched media occurred for the samples treated at 170°C, indicating possible spore germination. The treatment at 145°C and 30 minutes was effective in treating contaminated syringes and cloths. The contaminated meat samples underwent thermal degradation and had a maximum weight reduction of 74.1%, which was mainly due to moisture loss. The cloths, however, did not change in its appearance but syringes and other plastics melted and deformed. Thus, the thermal treatment was found to be a good disinfection method, causing severe damage to cells. The treated infectious waste materials can be disposed in landfills without potential recurrence of bacterial growth.

Keywords: *Infectious waste, Thermal treatment, Coconut oil, Bacillus subtilis, Chemistry*

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GRWD1 directly interacts with p53 and negatively regulates p53 transcriptional activity

Fujiyama, Hiroki , Tsuji, Takahiro , Hironaka, Kensuke , Yoshida, Kazumasa , Sugimoto, Nozomi , Fujita, Masatoshi

Glutamate-rich WD40 repeat containing 1 (GRWD1) functions as a histone chaperone to promote loading of the MCM replication helicase at replication origins. GRWD1 is overexpressed in several cancer cell lines, and GRWD1 overexpression confers tumorigenic potential in human cells. However, less is known concerning its oncogenic activity. Our previous analysis showed that GRWD1 negatively regulates the tumour suppressor p53 via the RPL11-MDM2-p53 and RPL23-MDM2-p53 axes. Here, we demonstrate that GRWD1 directly interacts with p53 via the p53 DNA-binding domain. Upon DNA damage, GRWD1 downregulation resulted in increased p21 expression. Conversely, GRWD1 co-expression suppressed several p53-regulated promoters. GRWD1 interacted with the p21 and MDM2 promoters, and these interactions required p53. By using the Human Cancer Genome Atlas database, we found that GRWD1 expression levels are inversely correlated with the expression levels of some p53-target genes. Interestingly, high GRWD1 expression in combination with low expression levels of some p53-target genes was significantly correlated with poor prognosis in skin melanoma patients with wild-type p53. Taken together, our findings suggest a novel oncogenic function of GRWD1 as a transcriptional regulator of p53 and that GRWD1 might be an attractive therapeutic target and prognostic marker in cancer therapy.

Keywords: *GRWD1, p53, Transcriptional activity, Tumourigenesis, Chemistry*

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iTRAQ-based quantitative proteomic analysis of two transgenic soybean lines and the corresponding non-genetically modified isogenic variety

Liu, Weixiao , Zhang, Zhe , Liu, Xuri , Jin, Wujun

To investigate the unintended effects of genetically modified (GM) crops, an isobaric tags for relative and absolute quantitation (iTRAQ)-based comparative proteomic analysis was performed with seed cotyledons of two GM soybean lines, MON87705 and MON87701×MON89788, and the corresponding non-transgenic isogenic variety A3525. Thirty-five differentially abundant proteins (DAPs) were identified in MON87705/A3525, 27 of which were upregulated and 8 downregulated. Thirty-eight DAPs were identified from the MON87701 × MON89788/A3525 sample, including 29 upregulated proteins and 9 downregulated proteins. Pathway analysis showed that most of these DAPs participate in protein processing in endoplasmic reticulum and in metabolic pathways. Protein–protein interaction analysis of these DAPs demonstrated that the main interacting proteins are associated with post-translational modification, protein turnover, chaperones and signal transduction mechanisms. Nevertheless, these DAPs were not identified as new unintended toxins or allergens and only showed changes in abundance. All these results suggest that the seed cotyledon proteomic profiles of the two GM soybean lines studied were not dramatically altered compared with that of their natural isogenic control.

Keywords: *Genetic modification, iTRAQ, qRT-PCR, Quantitative proteomic, Soybean seed cotyledons, Chemistry*

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Kinetic and solvent isotope effects in oxidation of halogen derivatives of tyramine catalyzed by monoamine oxidase A

Pajak, Malgorzata

The isotope effects approach was used to elucidate the mechanism of oxidative deamination of 3'-halotyramines, catalyzed by monoamine oxidase A (EC 1.4.3.4). The numerical values of kinetic isotope effect (KIE) and solvent isotope effect (SIE) were established using a non-competitive spectrophotometric technique. Based upon KIE and SIE values, some of the mechanistic details of investigated reaction were discussed.

Keywords: Deuterium, Enzyme mechanism, 3 -halotyramines, Isotope effects, MAO A, Chemistry

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Mass spectrometry-based methods for analysing the mitochondrial interactome in mammalian cells

Koshiba, Takumi , Kosako, Hidetaka

Protein–protein interactions are essential biologic processes that occur at inter- and intracellular levels. To gain insight into the various complex cellular functions of these interactions, it is necessary to assess them under physiologic conditions. Recent advances in various proteomic technologies allow to investigate protein–protein interaction networks in living cells. The combination of proximity-dependent labelling and chemical cross-linking will greatly enhance our understanding of multi-protein complexes that are difficult to prepare, such as organelle-bound membrane proteins. In this review, we describe our current understanding of mass spectrometry-based proteomics mapping methods for elucidating organelle-bound membrane protein complexes in living cells, with a focus on protein–protein interactions in mitochondrial subcellular compartments.

Keywords: BioID, Mass spectrometry, Mitochondria, Proteome, XL-MS, Chemistry

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miR-146a promoted breast cancer proliferation and invasion by regulating NM23-H1

Chen, Jun , Jiang, Qiang , Jiang, Xue-Qin , Li, De-Quan , Jiang, Xiao-Cheng , Wu, Xiao-Bo , Cao, Ya-Li

The study aimed to investigate the regulatory effect of miR-146a in proliferation, invasion and migration of breast cancer and its possible mechanism via NM23-H1. The expression levels of miR-146a in breast cancer with different pathological classification were significantly increased, while the expression levels of NM23-H1 were significantly decreased, which were closely correlated. Double luciferase reporter gene was used to verify the target regulatory relationship between miR-146 and NM23-H1 on a human breast cancer cell line. miR-146a was closely related to the proliferation and metastasis of breast cancer. miR-146a also promoted the growth of breast cancer in vivo via targeting NM23-H1. In conclusion, miR-146 can promote the proliferation and invasion of breast cancer by targeting NM23-H1.

Keywords: Breast cancer, Hsa-miR-146a, Invasion, NM23-H1, Proliferation, Chemistry

MiRNA-96-5p contributed to the proliferation of gastric cancer cells by targeting FOXO3

He, Xionghui, Zou, Kejian

Various microRNAs (miRNAs, miRs) and the forkhead box O (FOXO) family proteins have been shown to influence gastric cancer progression and development. Here, we aimed to identify the gastric cancer related miRNAs and their relationship with the FOXO family. MiRNA profiles were generated by miRNA microarray screening from pre-operative plasma samples. Quantitative reverse transcription PCR and western blot were used to determine the expression levels of miR-96 and FOXO family. 3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide assay and colony formation assay were used to test the cell viability. The miR-96-5p and FOXO3 interaction were confirmed by luciferase reporter assay. Our results demonstrated the excessive expression of miR-96-5p in gastric cancer cell lines and plasma samples from gastric cancer patients. In addition, the protein levels of FOXO3 were decreased in tissue samples from gastric cancer patients. Moreover, miR-96-5p accelerated the gastric cancer cell proliferation by directly targeting FOXO3. Therefore, we conclude that miR-96-5p might promote the progression of gastric cancer by directly targeting FOXO3 mRNA and downregulating the expression of FOXO3 protein, which provides new insights for the molecular mechanism of gastric cancer.

Keywords: *Forkhead box O3 (FOXO3), Gastric cancer, MiR-96-5p, Chemistry*

N¹-methyladenosine (m¹A) RNA modification: the key to ribosome control

Shima, Hiroki, Igarashi, Kazuhiko

RNA displays diverse functions in living cells. The presence of various chemical modifications of RNA mediated by enzymes is one of the factors that impart such functional diversity to RNA. Among more than 100 types of RNA modification, N¹-methyladenosine (m¹A) is found mainly in tRNA and rRNA of many living organisms and is known to be deeply implicated in the topology or function of the two classes of RNA. In this commentary article, we would like to deal with the functional significance of m¹A in RNA, and also to describe one methyltransferase installing m¹A in a large subunit rRNA, whose orthologue in *Caenorhabditis elegans* was discovered recently and was reported in this journal.

Keywords: *m1A, Rrna, Ribosome, Methyltransferase, Chemistry*

Nonmuscle myosin IIA and IIB differently suppress microtubule growth to stabilize cell morphology

Sato, Yuta , Kamijo, Keiju , Tsutsumi, Motosuke , Murakami, Yota , Takahashi, Masayuki

Precise regulation of cytoskeletal dynamics is important in many fundamental cellular processes such as cell shape determination. Actin and microtubule (MT) cytoskeletons mutually regulate their stability and dynamics. Nonmuscle myosin II (NMII) is a candidate protein that mediates the actin–MT crosstalk. NMII regulates the stability and dynamics of actin filaments to control cell morphology. Additionally, previous reports suggest that NMII-dependent cellular contractility regulates MT dynamics, and MTs also control cell morphology; however, the detailed mechanism whereby NMII regulates MT dynamics and the relationship among actin dynamics, MT dynamics and cell morphology remain unclear. The present study explores the roles of two well-characterized NMII isoforms, NMIIA and NMIIB, on the regulation of MT growth dynamics and cell morphology. We performed RNAi and drug experiments and demonstrated the NMII isoform-specific mechanisms—NMIIA-dependent cellular contractility upregulates the expression of some mammalian diaphanous-related formin (mDia) proteins that suppress MT dynamics; NMIIB-dependent inhibition of actin depolymerization suppresses MT growth independently of cellular contractility. The depletion of either NMIIA or NMIIB resulted in the increase in cellular morphological dynamicity, which was alleviated by the perturbation of MT dynamics. Thus, the NMII-dependent control of cell morphology significantly relies on MT dynamics.

Keywords: *Actin, Cell Morphology, Cytoskeletal crosstalk, Microtubule, Nonmuscle myosin II, Chemistry*

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Purification, biochemical and molecular study of lipase producing from a newly thermoalkaliphilic *Aeribacillus pallidus* for oily wastewater treatment

Ktata, Ameni , Krayem, Najeh , Aloulou, Ahmed , Bezzine, Sofiane , Sayari, Adel , Chamkha, Mohamed , Karray, Aida

Treatment of oily wastewater is constantly a challenge; biological wastewater treatment is an effective, cheap and eco-friendly technology. A newly thermostable, haloalkaline, solvent tolerant and non-induced lipase from *Aeribacillus pallidus* designated as GPL was purified and characterized of biochemical and molecular study for apply in wastewater treatment. The GPL showed a maximum activity at 65°C and pH 10 after 22 h of incubation, with preference to TC4 substrates. Pure enzyme was picked up after one chromatographic step. It displayed an important resistance at high temperature, pH, NaCl, at the presence of detergents and organic solvents. In fact, GPL exhibited a prominent stability in wide range of organic solvents at 50% (v/v) concentration for 2 h of incubation. The efficiency of the GPL in oil wastewater hydrolysis was established at 50°C for 1 h, the oil removal efficiency was established at 96, 11% and the oil biodegradation was confirmed through fourier transform infrared (FT-IR) spectroscopy. The gene that codes for this lipase was cloned and sequenced and its open reading frame encoded 236 amino acid residues. The deduced amino acids sequence of the GPL shows an important level of identity with *Geobacillus* lipases.

Keywords: *Aeribacillus pallidus, Lipase, Oil biodegradation, Thermo alkaliphilic, Chemistry*

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Socio-economic and environmental impacts of bioethanol production from sugarcane (*Saccharum officinarum*) and molasses in the Philippines

Eleazar, Pamela Joyce M. , Tongko-Magadia, Bernadette , Maligalig, Dalisay S. , Predo, Canesio D. , Movillon, Jovita L. , Demafelis, Rex B.

As the Philippine bioethanol industry reaches a decade and the debate on what bioethanol blending shall be imposed, this study assessed the socio-economic and environmental impacts of domestic bioethanol production parallel to the objectives of the biofuels law. Bioethanol production in the country has generated significant jobs or an estimated jobs of about 2,073 based on the actual bioethanol processing data for Crop Year (CY) 2017-2018 for the three bioethanol production systems (BPS) studied; and could potentially reach 10,620 jobs if mill capacities of the two bioethanol plants are met. Additionally, bioethanol industry was perceived to have a positive change for sugarcane farmers in terms of employment opportunities and cash income from bioethanol-related operations. The domestic bioethanol industry has even opened additional revenues to bioethanol-related industries of about PhP 1.2 B (23.9 M USD) for CY 2017-2018 and could even reach to PhP 3.0 B (60.4 M USD) if bioethanol plants can attain its installed mill and cogeneration capacities. Environmental impact assessment study, on the other hand, revealed that domestic bioethanol production can reduce GHG emissions by about 68 to 91% for the four BPS evaluated, compared to business-as-usual scenario of using fossil fuel.

Keywords: *Sugarcane bioethanol, Molasses bioethanol, Socio-economic impacts, Environmental impacts, Philippine bioethanol, Chemistry*

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Urate oxidase (UOx)-copper oxide (CuO)-carbon polymer composite electrode for electrochemical detection of uric acid

Buenaventura, Angelo Gabriel E.

This study presents an electrochemical biosensor developed for uric acid (UA) determination using carbon paste electrode (CPE) modified with copper (II) oxide (CuO) particles and urate oxidase (UOx) enzyme. Base CPE is prepared using a multi-walled carbon nanotube (MWCNT) and a polydimethylsiloxane (PDMS) binder. The main sensing process is based on the oxidation of UA into 5-hydroxyisourate (HIU) as catalyzed by UOx, forming H₂O₂ as byproduct, and then the H₂O₂ reduction-oxidation (redox) reaction converts CuO to form Cu₂O; the amount of H₂O₂ and hence UA in the sample is measured by the oxidative current measured for the conversion of Cu₂O back to CuO. Cyclic Voltammetry (CV) measurements revealed that the activity of UOx was retained with an apparent Michaelis constant (K_m^{app}) to be equal to 41.46 μ M. Differential Pulse Voltammetry (DPV) measurements of UA using UOx-CuO-CPE showed a linear response ranging from 10 μ M to 79.4 μ M UA with a limit of detection (LOD) determined to be equal to 8.82 μ M. UOx-CuO-CPE was shown to be selective towards UA even in the presence of creatinine, xanthine, and glucose. Furthermore, UOx-CuO-CPE was shown to be reusable (3.28% RSD), and its fabrication is repeatable using single factor Analysis of Variance (ANOVA) [$F(1.396) < F_{critical}(5.143)$]. UOx-CuO-CPE was also shown to be stable even after five weeks of storage using the two-sample t-test [$t(0.156) < t_{critical}(4.303)$]. Based on a recovery test using synthetic urine sample, this study showed the applicability of UOx-CuO-CPE in the detection of UA in human urine with 90.27%–102.03% recovery ($n = 3$).

Keywords: *Urate Oxidase, Copper (II) Oxide, Carbon Paste Electrode, Uric Acid, Chemistry*

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Proof of concept implementation of an enterprise service bus for health information exchanges

Zuniga, Rose Ann , Mendoza, Marie Jo-anne , Felizmenio, Edgardo , Del Mundo, Joseph Benjamin , Zuniga, Philip Christaian

Integration of health systems is one of the biggest problem in eHealth today. There are a lot of systems, yet they were developed using different platforms and technologies, making them virtually impossible to connect. In this paper, we discussed how to implement an ESB as the integration platform for health data. We identified use cases and functional requirements. Logical and deployment architecture were developed, and an actual proof of concept of an ESB is developed. Experiments were also done to determine the overhead caused by the ESB. Some of the functionalities of the ESB were examined to determine their individual overheads.

Keywords: *Enterprise Service Bus, Interoperability, Health Information Exchange, OpenHIE, Computer science*

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NP

ECOLOGY

Analysis of the integrated water resource management in a water quality management area in the Philippines: the case of Meycauayan-Marilao-Obando River System

Torio, Diana A. , Jimena, Carla Edith G. , Amparo, Jennifer Marie S. , Geges, Dhino B. , Visco, Emilia S. , Malenab, Ma. Charisma T.

This research evaluates the implementation and management of the Meycauayan- Marilao-Obando River System Water Quality Management Area (MMORS WQMA) in reference to the pillars of Integrated Water Resource Management (IWRM) using a multimethod approach. Research participants include representatives from regional regulatory agencies and local government units of seven cities and municipalities along the river system. Aside from ecosystem, institutional and socio-political drivers, the designation of MMORS as a WQMA was influenced by the shared common interest and endorsement of local stakeholders including financial support from international agencies. Also, an enabling policy environment that reflects IWRM pillars helped in the creation of MMORS WQMA. However, disparities in WQMA Governing Board (GB)'s and the local government units' (LGUs) level of awareness and actual level of implementation of functions are observed, hence, the need for integration. The lack of a guiding system or framework in monitoring, evaluation and information management hinders better integration among the different agencies and LGUs in the MMO WQMA GB. Also, lack of financial, human and technical resources limit performance of the GB. Improving mechanisms may include approval of the National Water Quality Management Fund; development of financial and annual plans (with short-term targets), collaboration among GB members and capacitybuilding.

Keywords: *Philippine Clean Water Act (CWA) of 2004, Water governance, Water Quality Management Area Governing Board, Ecology*

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2016,
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NP

Context dependence: a conceptual approach for understanding the habitat relationships of coastal marine fauna

Bradley, Michael, Nagelkerken, Ivan, Baker, Ronald, Sheaves, Marcus

Coastal habitats, such as seagrasses, mangroves, rocky and coral reefs, salt marshes, and kelp forests, sustain many key fish and invertebrate populations around the globe. Our understanding of how animals use these broadly defined habitat types is typically derived from a few well-studied regions and is often extrapolated to similar habitats elsewhere. As a result, a working understanding of their habitat importance is often based on information derived from other regions and environmental contexts. Contexts such as tidal range, rainfall, and local geomorphology may fundamentally alter animal–habitat relationships, and there is growing evidence that broadly defined habitat types such as “mangroves” or “salt marsh” may show predictable spatial and temporal variation in habitat function in relation to these environmental drivers. In the present article, we develop a framework for systematically examining contextual predictability to define the geographic transferability of animal–habitat relationships, to guide ongoing research, conservation, and management actions in these systems.

Keywords: *Context, Setting, Habitat, Fauna, Transferability, Ecology*

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Corridors of clarity: four principles to overcome uncertainty paralysis in the Anthropocene

Polasky, Stephen, Crepin, Anne-Sophie, Walker, Brian, Biggs, Reinette Oonsie, Carpenter, Stephen R., Folke, Carl, Peterson, Garry, Scheffer, Marten, Barrett, Scott, Daily, Gretchen, Ehrlich, Paul, Howarth, Richard B., Hughes, Terry, Levin, Simon A., Shogren, Jason F., Troell, Max, Xepapadeas, Anastasios

Global environmental change challenges humanity because of its broad scale, long-lasting, and potentially irreversible consequences. Key to an effective response is to use an appropriate scientific lens to peer through the mist of uncertainty that threatens timely and appropriate decisions surrounding these complex issues. Identifying such corridors of clarity could help understanding critical phenomena or causal pathways sufficiently well to justify taking policy action. To this end, we suggest four principles: Follow the strongest and most direct path between policy decisions on outcomes, focus on finding sufficient evidence for policy purpose, prioritize no-regrets policies by avoiding options with controversial, uncertain, or immeasurable benefits, aim for getting the big picture roughly right rather than focusing on details.

Keywords: *Global environmental change, Science-policy interface, Sufficient evidence, Uncertainty, Ecology*

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Ecological synthesis and its role in advancing knowledge

Halpern, Benjamin S., Berlow, Eric, Williams, Rich, Borer, Elizabeth T., Davis, Frank W., Dobson, Andy, Enquist, Brian J., Froehlich, Halley E., Gerber, Leah R., Lortie, Christopher J., O Connor, Mary I., Regan, Helen, Vazquez, Diego P., Willard, Geoff

Synthesis has become ubiquitous in ecology. Despite its widespread application to a broad range of research topics, it remains unclear how synthesis has affected the discipline. Using a case study of publications ($n = 2304$) from the National Center for Ecological Analysis and Synthesis compared with papers with similar keywords from the Web of Science ($n = 320,000$), we address several questions about the comparative impact of synthesis, the role of synthesis in driving key research themes, and whether synthesis is focused on different topics than is the broader ecological literature. We found much higher citation rates for synthesis papers overall (fivefold more) and within eleven key topic themes (e.g., species richness, biodiversity, climate change, global change). Synthesis papers often played key roles in driving, redirecting, or resolving core questions and exhibited much greater cross-theme connectivity. Together, these results indicate that synthesis in science has played a crucial role in accelerating and advancing ecological knowledge.

Keywords: *Synthesis, Environmental science, Impact assessment, Research trends, Ecology*

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The ecology of disturbance interactions

Burton, Philip J., Jentsch, Anke, Walker, Lawrence R.

Global change has been accompanied by recent increases in the frequency and intensity of various ecological disturbances (e.g., fires, floods, cyclones), both natural and anthropogenic in origin. Because these disturbances often interact, their cumulative and synergistic effects can result in unforeseen consequences, such as insect outbreaks, crop failure, and progressive ecosystem degradation. We consider the roles of biological legacies, thresholds, and lag effects responsible for the distinctive impacts of interacting disturbances. We propose a hierarchical classification that distinguishes the patterns and implications associated with random co-occurrences, individual links, and multiple links among disturbances that cascade in chains or networks. Disturbance-promoting interactions apparently prevail over disturbance-inhibiting ones. Complex and exogenous disturbance cascades are less predictable than simple and endogenous links because of their dependency on adjacent or synchronous events. These distinctions help define regional disturbance regimes and can have implications for natural selection, risk assessment, and options for management intervention.

Keywords: *Biological legacies, Cumulative effects, Disturbance cascades, Disturbance regime, Extreme events, Ecology*

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Evaluating trophic status as a proxy of aquatic ecosystem service provisioning on the basis of guidelines

St. Gelais, Nicolas, Lapierre, Jean-Francois, Siron, Robert, Maranger, Roxane

Ecologists typically associate water quality with trophic status, where oligotrophic is considered excellent and presumably provides more aquatic ecosystem services. However, water quality is perceived differently among observers with different worldviews. For example, agriculture and public health sectors quantify the provisioning of aquatic ecosystem services on the basis of different guidelines, but are their guidelines breached more frequently with increasing productivity? We developed an integrative ecosystem service framework using Canadian guidelines as thresholds for drinking, swimming, irrigation, suitability for livestock and aquatic wildlife in rivers. Drinkability was the most sensitive ecosystem service, met in 23% of the sampling events, whereas livestock was provided in 99%. Trophic status is a fair proxy for ecosystem services limited by fecal contamination, because nutrients are related to human and animal populations but not to those limited by metals. Using guideline thresholds to assess the safe provisioning of multiple aquatic ecosystem services across diverse worldviews could facilitate understanding among different perspectives.

Keywords: *Ecosystem services, Water quality, Worldviews, Guidelines, Aquatic, Trophic status, Canadian rivers, Ecology*

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Fence ecology: frameworks for understanding the ecological effects of fences

McInturff, Alex, Xu, Wenjing, Wilkinson, Christine E., Dejid, Nandintsetseg, Brashares, Justin S.

Investigations of the links between human infrastructure and ecological change have provided eye-opening insights into humanity's environmental impacts and contributed to global environmental policies. Fences are globally ubiquitous, yet they are often omitted from discussions of anthropogenic impacts. In the present article, we address this gap through a systematic literature review on the ecological effects of fences. Our overview provides five major takeaways: 1) an operational definition of fencing to structure future research, 2) an estimate of fence densities in the western United States to emphasize the challenges of accounting for fences in human-footprint mapping, 3) a framework exhibiting the ecological winners and losers that fences produce, 4) a typology of fence effects across ecological scales to guide research, and 5) a summary of research trends and biases that suggest that fence effects have been underestimated. Through highlighting past research and offering frameworks for the future, we aim with this work to formalize the nascent field of fence ecology.

Keywords: *Fence ecology, Linear infrastructure, Connectivity, Anthropogenic impacts, Socioecological systems, Ecology*

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Forest litterfall in Mount Kasunogan

Belar, Irvin Dan B.

Forest litterfall is plant materials that have been fallen to the ground. It is vital in the process of nutrient forests. The vegetation of the stations in Mount Kasunogan consisted of 7 plant species from 7 different families; Tamanu (*Calophyllum*) from Calophyllaceae, Sweet flag (*Calamus* sp.) from Acoraceae, Pitanga (*Eugenia* sp.) from Myrtaceae, Cogon Grass (*Imperata cylindrica*) from Poaceae, Hickory Wattle (*Mangium* sp.) from Fabaceae, Nutrush (*Scleria scrobiculata*) from Cyperaceae, Screw pine (*Pandanus odoratissimus*) from Pandanaceae, and Ivory Mahogany (*Dysoxylum* sp.) from Meliaceae. The researchers investigated litterfall production and decomposition rate and correlated these two essential processes to the soil physical and chemical composition of Mount Kasunogan. Organic matter, soil pH level, and soil moisture have a significant influence on litter production and what factors could increase or decrease its production. It has been denoted that all soil attributes (organic matter, soil pH level, and soil moisture) impact forest litterfall production. However, two of the attributes, which are the organic matter and soil moisture, barely contribute to the litterfall. In contrast, the soil pH is perfectly correlated and has a significant effect on litterfall production. Station three's advantage regarding the soil pH and wind presence due to its high elevation explains a large amount of litter production in the area. In this study, it is also concluded that the acidic the soil gets, the faster the decomposition, which also resulted in the faster decomposition in station 2 among the rest of the sites in Mount Kasunogan.

Keywords: *Litterfall production, decay or decompose, litterfall, nutrient cycling, Ecology*

SMCC Interdisciplinary Journal, Volume No. 1 Issue No. 1,
2020,
(Filipiniana Analytics)

Improving instructional fitness requires change

Herrera, Jose, Haskew-Layton, Renee, Narayanan, Madhavan, Porras-Alfaro, Andrea, Jumpponen, Ari, Chung, Y. Anny, Rudgers, Jennifer A.

Transmission of information has benefitted from a breathtaking level of innovation and change over the past 20 years; however, instructional methods within colleges and universities have been slow to change. In the article, we present a novel framework to structure conversations that encourage innovation, change, and improvement in our system of higher education, in general, and our system of biology education, specifically. In particular, we propose that a conceptual model based on evolutionary landscapes in which fitness is replaced by educational effectiveness would encourage educational improvement by helping to visualize the multidimensional nature of education and learning, acknowledge the complexity and dynamism of the educational landscape, encourage collaboration, and stimulate experimental thinking about how new approaches and methodology could take various fields associated with learning, to more universal fitness optima. The framework also would encourage development and implementation of new techniques and persistence through less efficient or effective valleys of death.

Keywords: *Educational landscapes, Evolutionary instruction, Inclusive teaching, Teaching strategies, Ecology*

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Perceived effects of lead recycling to selected communities in Bulacan, Philippines
*Lagos, Devralin T. , Mendoza, Ma. Emilinda T. , Jimena, Carla G. , Amparo, Jennifer S. , Visco, Emilia S.,
 Dumalanta, Rochelle*

The province of Bulacan, Philippines is considered as the biggest producer of used lead acid battery (ULAB) in the country and in Southeast Asia. But with the boom of the ULAB industry, a continued concern on the industry's effect to human health and the environment intensifies. The study was conducted in two municipalities of Bulacan, Philippines to determine the perception of the respondents on the effects of lead recycling to their health and their community. These two areas are where ULAB industry is concentrated. Data were gathered from primary and secondary sources. Interview schedule using a structured interview guide and key informant interview were used. The respondents believed that there are toxic and hazardous substances used in lead recycling that contributed to their health problems and environmental pollution. Identified pathways of pollution include air, soil and water. But while they are aware of the health and environmental risks this industry brings, they also recognized its economic contribution to their families and their respective communities. The complexity of the problem continues to pose a challenge that needs to be addressed soon to balance economic prosperity and the communities' welfare.

Keywords: *Perceived effects, Used lead acid battery recycling, Human and environmental health, Ecology*

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 2013,
 (Filipiniana Analytics)
 NP

**Vulnerability assessment to climate change of households from Mabacan, Sta. Cruz and
 Balanac Watersheds in Laguna, Philippines**
*Maligaya, Hazel , Ballaran, Jr., Vicente G. , Mendoza, Maria Emilinda T. , Dorado, Rowena A. , Arias,
 Jaimie*

The Province of Laguna has been identified as one of the most vulnerable to climate change. Despite the various efforts of the local government unit, the province still suffers massive damages brought about by typhoons, flooding and landslides. This signals the need for a better strategy to manage climate change related hazards. As a first step, it is necessary to characterize the vulnerability of households in the province. This study contributed towards this end a descriptive analysis of household exposure to impacts of climate related hazards and estimating a household's vulnerability index using the Vulnerability as Expected Poverty (VEP) approach. The mean VEP for a per capita monthly poverty threshold of US\$1.25 is 37%, 41% for US\$1.5 and 46% for US\$2.0. Among the different sectors, those dependent on aquaculture/fishery had the highest incidence of vulnerability followed by those dependent on employment in the manufacturing sector. In terms of geographical location, households in the coastal areas were found to have the highest incidence, followed by those in the lowland and lastly those in the midland to highland areas.

Keywords: *Climate Change, Laguna, Vulnerability, Ecology*

The Journal of Environmental Science and Management, Volume No. 19 Issue No. 1, 9-18
 2016,
 (Filipiniana Analytics)
 NP

Case-based teaching and learning in enhancing the academic performance of students in disaster readiness and risk reduction

Abanto, Lemuel M.

The main purpose of this study was to assess the impact of Case-Based Teaching and Learning to the academic performance of Science, Technology, Engineering and Mathematics (STEM) students in Disaster Readiness and Risk Reduction of Malinta National High School-Senior High, Valenzuela City. This study made use of True-Experimental Research design that utilized standard questionnaires as a primary data gathering tool, the questionnaires undergo Face and Content validation as well as the Cronbach's Alpha and obtained .87 reliability results. The Control Group obtained a mean score of 26.15 and the Experimental Group obtained a mean score of 33.8. The results show that there is a difference of 15.32 % from their posttest. The t-test revealed that there is a significant difference between the posttest result of Control Group and the Experimental Group. Case-Based Teaching and Learning includes collaboration between participants and discussion of specific situations, typically examples of real-world situations. The teacher serves as facilitator in Case-Based Teaching thus encourages case exploration and consideration of the actions of the characters in the light of their own choices.

Keywords: *disaster readiness and risk reduction, case-based teaching and learning, outcome-based education, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Enriching the technological pedagogical content knowledge (TPACK) of science teachers through an enhancement training program

Abrencillo, Erwin R., Ph.D.

The study was conducted to enhance the Technological Pedagogical Content Knowledge (TPACK) of selected public school science teachers in Quezon province through development of a training program. The mixed method of research design was utilized in the study wherein quantitative data and qualitative data were triangulated. The respondents were thirty (30) science teachers from Division of Lucena City, Division of Tayabas City and Division of Quezon. The weighted mean, t-test for significance and one-way ANOVA were used as statistical treatment of the data. Based on the findings, it was concluded that the respondents have sufficient knowledge in each domain of Technological Pedagogical Content Knowledge (TPACK). However, aiming to elevate higher the TPACK of science teachers, an enhancement training program was developed. Implemented to the respondents, it is valid for use and it can enhance the science teachers' TPACK level regardless of their age, sex, and teaching experience. It was recommended that science teachers may consider using the TPACK framework in order to develop their knowledge level and to enhance the teaching and learning processes. School administrators may also adapt the TPACK training program as part of their faculty development program.

Keywords: *enhancement training program, science teachers, technological pedagogical content knowledge, Education*

Luz y Saber, Volume No. 13 Issue No. 3,
2019,
(Filipiniana Analytics)

Information literacy program for lifelong learning in higher education

Lozanta, Ana Mae Kristine H.

The main objective of the research is the development of an Information Literacy Program for lifelong learning. It determines the information literacy skills of tertiary students and school administrators. It defines the management competencies of the school administrators in terms of planning, organizing, controlling, and leading. The participants in the research included five hundred two (502) tertiary students and fifty-eight (58) school administrators from different universities in the National Capital Region (NCR). The study utilized the descriptive developmental research design. The results show that the information literacy skills of students are above average in the task definition, information seeking strategies, location and access, use of information, and synthesis. However, the evaluation skills are interpreted as average and need to be improved for the research activities. On the other hand, school administrators are superior in information literacy skills. They are competent in terms of their management functions. There is a significant relationship between the information literacy skills and managerial competencies of the school administrators. These are considered essential factors in creating and sustaining an information literacy program. The crafted guidelines for the management and the utilization of the Information Literacy Program for school administrators will greatly support its sustainability.

Keywords: *information literacy, management functions, lifelong learning, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Organizational collaboration for an industry-academe symbiotic framework

Navarro, Narro R.

This study explored the factors and constraints that promote and hinder collaboration. Taking a perspective on knowledge interaction, this project explored how formal collaborative relationships between industry and academic based environments emerge and develop, focusing on the factors, constraints, measures and common areas and scenarios of industry and academe. The study is anchored on the theory of Resource Dependency and Systems Theory.

Keywords: *collaboration, resource dependency, systems theory, Education*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Teacher engagement and performance effectiveness: keys to organizational efficiency

Comighud, Sheena Mae T.

The study examines the level of teacher engagement in relation to their job performance effectiveness in the Schools Division of Bayawan City, Negros Oriental, Region VII, Philippines. The study examines the level of teacher engagement in relation to their job performance effectiveness in the Schools Division of Bayawan City, Negros Oriental, Region VII, Philippines. The respondents were 90 teachers of Bayawan City. The study utilized percentage, weighted mean, Mann Whitney U test, Kruskal-Wallis test, and Spearman rank correlation coefficient. The study follows the descriptive-correlational research design. The survey instruments covered the engagement of the teachers in terms of five relevant areas, namely content knowledge and pedagogy, learning

environment and diversity of learners, curriculum and planning, assessment and reporting, plus factors. The salient finding revealed that the teachers' level of engagement on the five key areas was "high" as perceived by the school heads and as "very high" as assessed by the teachers themselves. The job performance rating of the respondents was rated at "very satisfactory" levels. A strong and significant relationship was found between the teachers' level of engagement and their individual job performance effectiveness. There is also a significant difference in their engagement when respondents are grouped according to educational attainment, level of seminars attended, and position held.

Keywords: *employee engagement, job performance effectiveness, organizational efficiency, Education*

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2020,
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ENGINEERING

0104

3D crystal orientation mapping of recrystallization in severely cold-rolled pure iron using laboratory diffraction contrast tomography

Sun, Jun, Holzner, Christian, Bale, Hrishikesh, Tomita, Miho, Gueninchault, Nicolas, Bachmann, Florian, Lauridsen, Erik, Inaguma, Toru, Kimura, Masao

The mechanism of recrystallization texture development of cold-rolled metal and steel largely depends on the material chemical composition, cold-rolling reduction, and annealing treatment conditions. To clarify the mechanism, it is important to identify the locations where recrystallization starts and progresses within cold-rolled materials. Using laboratory diffraction contrast tomography (LabDCT), three-dimensional (3D) crystal orientation mapping corresponding to different stages of recrystallization has been successfully performed for pure iron sheets that were severely cold-rolled and heated at different temperatures. In cold-rolled iron with 99.2% reduction, the deformation texture was a strong α -fiber (RD// $\langle 110 \rangle$). During annealing in the temperature range of 773–973 K, recrystallized grains were formed with textural components of $\{100\}$, $\{211\}$, $\{111\}$ and $\{411\}$, and the α -fiber changed to the $\{100\}\langle 012 \rangle$ component. Recrystallized grains were generated at rather random locations within the sample. The size of recrystallized grains in the center region was 20–30% larger than that in the surface region. These results suggest that the nucleation is driven by the large strain caused by severe rolling. The number of recrystallization sites was larger in the surface region than in the center region and the competition of selective growth among recrystallized grains was more severe in the surface region, resulting in a smaller grain size. The volume data of the 3D crystal orientation mapping obtained by LabDCT provided crucial information for understanding the recrystallization mechanism including the nucleation and/or selective growth.

Keywords: *X-ray diffraction, Recrystallization, Three dimensions, LabDCT, Grain orientation, Engineering*

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(Filipiniana Analytics)
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0105

Accuracy evaluation of phase-field models for grain growth simulation with anisotropic grain boundary properties

Miyoshi, Eisuke, Takaki, Tomohiro, Ohno, Munekazu, Shibuta, Yasushi

The phase-field method has been widely employed recently for simulating grain growth. Phase-field grain growth models are classified into two types according to their conservation constraints for phase-field variables: the multi-phase-field model and the continuum-field model. In addition, within the multi-phase-field model framework,

three models with different formulations exist. These models are reported to accurately simulate grain growth under conditions of isotropic or weakly anisotropic grain boundary energy and mobility. However, for cases of strongly anisotropic grain boundary properties, the accuracy of these models has not yet been examined in detail. In this study, using the continuum-field model and three different multi-phase-field models, systematic grain growth simulations with anisotropic grain boundary energies and mobilities are performed. Through the detailed investigation of the accuracy of the simulated results, the suitability of each model for anisotropic grain growth simulations is revealed. Furthermore, based on the higher-order terms, accuracy improvement of the phase-field models is attempted.

Keywords: Phase-field model, Grain growth, Microstructure, Grain boundary energy, Grain boundary mobility, Engineering

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(Filipiniana Analytics)
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0106

Agglomeration and removal of alumina inclusions in molten steel with controlled concentrations of interfacial active elements

Sasai, Katsuhiko

In this study, Al deoxidation experiments have been performed in a mildly stirred steel bath with controlled \underline{Q} and S concentrations, to investigate the effects of interfacial active elements on the agglomeration and removal of Al_2O_3 inclusions in molten steel. The decrease rate constants of total Al_2O_3 inclusions, Al_2O_3 cluster inclusions, and Al_2O_3 single inclusions as well as the maximum average diameter of Al_2O_3 cluster inclusions decrease with increasing \underline{Q} and S concentrations in molten steel. However, the effect of \underline{Q} is much greater than that of S. These experimental results have been analyzed based on the kinetics of Al_2O_3 inclusion removal and the interfacial chemical interaction between Al_2O_3 inclusions in molten steel. The following findings have been obtained on the agglomeration and removal mechanisms of Al_2O_3 inclusions in molten steel. The Al_2O_3 inclusions in molten steel are removed by a mechanism whereby large Al_2O_3 cluster inclusions, formed by Al deoxidation, float and separate while repeatedly agglomerating and coalescing with fine Al_2O_3 single inclusions suspended in molten steel. The agglomeration of Al_2O_3 inclusions during floating and separation can also be explained by a mechanism whereby the agglomeration force due to the cavity bridge force is exerted between the Al_2O_3 inclusions and the Al_2O_3 inclusions come in complete contact when the Al_2O_3 inclusions with thermodynamically agglomerating tendency are approaching each other. The effects of \underline{Q} and S interfacial active elements are considered in both these mechanisms.

Keywords: Steelmaking, Inclusion, Agglomeration and removal, Kinetics of inclusion removal, Agglomeration force, Interfacial chemical interaction, Engineering

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2020,
(Filipiniana Analytics)
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0107

Agglomeration of return fines of sinter for blast furnace raw materials

Ogasawara, Yasushi, Sato, Takeshi, Ishii, Jun, Murai, Ryota, Watakabe, Shiro

Return fines of sinter were agglomerated with a binder material such as cement and fine powder of blast furnace slag in order to use the agglomerates as raw materials in the blast furnace. Reduction tests of the agglomerates were carried out to investigate the high temperature properties of the agglomerates. The following findings were

obtained. The agglomerates have lower RDI ($RDI < 20\%$) than sinter because sinter, which consists of brittle glassy silicate, was arranged discretely in the agglomerates and bonded by the soft materials of the binder, and as a result, size degradation during reduction was prevented. The agglomerates have higher RI ($RI > 70\%$) than sinter due to the high abundance ratio of fine pores in the agglomerates. Moreover, in comparison with sinter, the agglomerates also have equal or greater strength after reduction at 700°C and 900°C because solid phase sintering was promoted by adding ultrafine iron oxide powder. Therefore, as a blast furnace raw material, the permeability and reducibility of the agglomerates of return fines of sinter are superior to those of conventional sinter. This concept is considered to be effective for utilizing sinter fines as blast furnace raw materials in a high pulverized coal rate and low coke rate operation.

Keywords: *Agglomeration, Return fines, RDI, RI, Strength after reduction, Engineering*

ISIJ International, Volume No. 60 Issue No. 7, 1389-1394
2020,
(Filipiniana Analytics)
F(S) TS300 T29 60/7 2020

0108

Analysis of crack propagation under different die tilt configuration on a small outline transistor

Danao, Louis Angelo M. , Callanga, Jennifer F., Macaspac, Hannah Erika D. , Mena, Manolo G.

In today's microelectronic industry, the increasing demand for miniaturization and high function integration poses a big challenge in maintaining the reliability of the package. It was found out that majority of the reliability problems can be attributed to thermal and mechanical loadings during manufacturing and assembling process. Die cracking and die tilting are two of the most common defects originating from this process that affect the reliability of the electronic packages. This study aims to investigate the influence of die tilting to the propensity of crack propagation on the silicon die. In this research, the cooling phase of the die and clip attach reflow of small outline transistor was simulated using a finite element-based software. An initial crack was incorporated in the silicon die model to show the imperfections acquired during manufacturing stage. J-integral (J) parameter of fracture mechanics was employed as a criterion for the behavior of incipient cracks. With the assumption that the die used in this study exhibits linear elastic, isotropic property, the calculated J-integral values were correlated to the energy release rate (G). The simulation results showed that as the tilt angle increases, there is also a significant increase in the value of J-integral. The highest J value was observed on the maximum tilt angle. Moreover, this study presents clear relationship between the die strength and the specified failure factors; crack and tilt.

Keywords: *Fracture Mechanics, ANSYS, Crack Propagation, Engineering*

Philippine Engineering Journal, Volume No. 41 Issue No. 1, 19-32
2020,
(Filipiniana Analytics)
NP

0109

Analysis of the strength of bamboo reinforced plastic bottle concrete beams for low-cost housing

Cabatuando, Johann Snow S.

The world consumes about a million plastic bottles a minute, with the Philippines as one of the top plastic polluters. It is currently one of the many crises that the Philippines is experiencing. Using plastic bottles in designing a reinforced concrete beam is one of the many examples in the modernization of sustainable structures. An alternative for traditional construction materials is the key point, thus, this study incorporated the use of bamboo fibers as reinforcement in replacement of steel which is known for its high cost. Bamboo is known for its

low-cost, wide availability and it is well known for its diverse properties. This research intends to investigate the flexural capacity of bamboo reinforced plastic bottle concrete beams for low-cost housing, determine the potential of this model in the field of construction, and analyze its effect on cost.

Keywords: *bamboo reinforcement, steel reinforcement, concrete blocks, plastic bottles, low-cost-housing, Engineering*

Antorcha, Volume No. 6 Issue No. 2,
2019,
(Filipiniana Analytics)

0110

Analysis of void structure in deforming packed bed of monodispersed spherical particles

Nogami, Hiroshi, Yamawaki, Takuto

The void structure in the deforming packed bed like cohesive zone of blast furnace was discussed. The examined packed bed consisted of mono-dispersed spherical particles and was numerically prepared by using the discrete element method. From the obtained packing particle structure, the characteristics of the void space, namely voidage, surface area, hydraulic radius, flow path network structure, width and length of the flow path, were extracted. The actual hydraulic radius deviated from the one calculated from the bed shrinkage with the bed deformation, and this deviation resulted the large difference in the pressure drop in the packed bed. The flow path (void) network was successfully extracted from the particle packing structure. Additionally, distributions of the path width and length were obtained. The choking of flow path with bed shrinkage can be quantitatively visualized. In the softening ore particle bed with nut coke mixing, the flow path structures around ore and nut coke particles showed different behavior. With the obtained characteristics of the void structure, the variations of the pressure drops in the reduction test under loading and in the softening ore layer with coke mixing can be explained.

Keywords: *Void network structure, Hydraulic radius, Deforming packed bed, Cohesive zone, Nut coke mixing, Blast furnace, Engineering*

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2020,
(Filipiniana Analytics)
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0111

Application of quaternary acid mixture to microwave digestion effective for various kinds of steel samples

Nakayama, Kenichi, Wagatsuma, Kazuaki

This paper suggests a procedure of an improved digestion method, which can be applied to a variety of steel samples, for preparing the sample solution to quantify alloyed elements and sulfur simultaneously in inductively coupled plasma atomic emission spectrometry. A conventional digestion method using a mixture of hydrochloric and nitric acid has a poor ability to decompose tool steel completely. Alternatively, a microwave digestion method, in which an acid mixture of hydrochloric acid, hydrofluoric acid, nitric acid, and phosphoric acid was prepared with 1:1:1:1 volume ratio, enabled various steel samples including tool steel and stainless steel to be fully decomposed. Due to no addition of sulfuric acid, the sulfur content in the samples could be determined. The suggested procedure was applicable to determine sulfur, vanadium, chromium, manganese, cobalt, nickel, molybdenum, and tungsten in a variety of steel alloys using the same dissolution procedure.

Keywords: *Inductively coupled plasma atomic emission spectrometry, Sample preparation, High-speed tool steel, Stainless steel, Engineering*

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(Filipiniana Analytics)
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0112

Artificial MnS inclusions in stainless steel: fabrication by spark plasma sintering and corrosion evaluation by microelectrochemical measurements

Nishimoto, Masashi, Muto, Izumi, Sugawara, Yu, Hara, Nobuyoshi

Spark plasma sintering was used to fabricate type 304L stainless steel specimens containing artificial manganese sulfide (MnS) inclusions, and a microelectrochemical technique was used to characterize the pit initiation behavior at the MnS. A 200 m square electrode area that included an artificial MnS particle was potentiodynamically polarized in 0.1 M NaCl, and the electrode surface was observed in situ by optical microscopy. The anodic dissolution of the MnS particle was observed in the passive region of the stainless steel. The pit occurred at the boundary between the particle and the steel matrix after the particle dissolved slightly. The dissolution potential and pit initiation behavior at the artificial MnS particles in the sintered stainless steel were confirmed to be similar to those at MnS inclusions in commercial stainless steels.

Keywords: *Stainless steel, Sulfide inclusion, Pitting corrosion, Spark plasma sintering, Microelectrochemical measurement, Engineering*

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0113

Ash particle behaviors during combustion and gasification of coke

Ueki, Yasuaki, Teshima, Koki, Yoshiie, Ryo, Naruse, Ichiro

A significant amount of CO₂ gas is emitted from blast furnaces in ironmaking processes because large amounts of coke and pulverized coal are consumed as the reducing agent and heat source. Accordingly, CO₂ emissions from blast furnaces should be reduced to control global warming. One promising method to achieve the CO₂ reduction involves decreasing the reducing agent rate (RAR) during blast furnace operation. However, fine particles such as ash, derived from coke and pulverized coal, may affect the permeability in the furnace under low RAR operation. Therefore, the behavior of ash particles in a coke lump during combustion and gasification was elucidated experimentally in this work. Combustion and gasification experiments on a single coke lump were conducted in air and in a CO–CO₂ gas mixture atmosphere at temperatures from 1 473 to 1 673 K. The ash particles in the coke lump were observed using a scanning electron microscope (SEM). Many large ash particles were observed near the surface of the coke lump during combustion. This is because the ash particles coalesced with the neighboring ash particles near the surface. Only molten fine ash particles were formed during gasification. This difference in the ash behavior during combustion from gasification will depend on the consumption behavior of the carbonaceous matrix.

Keywords: *Coke, Ash particle, Combustion, Gasification, Blast furnace, Engineering*

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Assessment of climate hazards using PRECIS Regional Climate Model (RCM): a case study in Cameron Highlands, Pahang, Malaysia

Chin, Kah Seng

This study aimed to assess the differences in modelling disaster risks results when using historical precipitation and when using simulated precipitation associated with future Intergovernmental Panel on Climate Change (IPCC) climate scenarios. Subsequently, the relationship between climate change and climate hazards was analyzed in this study. The secondary data analyzed included historical precipitation (1983-2017), flood and landslide events records, and Providing Regional Climates for Impacts Studies (PRECIS) regional climate model (RCM):A1B, A2 and B2 scenarios. By comparing the historical precipitation data with the RCM scenarios, the results showed that the precipitation was correlated with A1B scenario ($r = 0.695$). The relationship between climate change and hazards was identified to be a positive correlation. The historical daily precipitation (1983-2017) showed a positive correlation with flood and landslide events ($r = 0.530$, $r = 0.797$, respectively). As for prediction of climate hazards, the RCM A1B, A2 and B2 scenarios showed correlations with flood event: $r = 0.648$, 0.384 and 0.417 , respectively. Similar results were obtained for landslide and the RCM A1B, A2 and B2 scenario: $r = 0.498$, 0.751 and 0.654 , respectively. Precipitation simulation by PRECIS RCM indicated increased levels of precipitation in the Cameron Highlands for the 2018 - 2069. Commensurate with this, great possibility of increasingly serious consequential hazards such as flood and landslide events are expected. **(Author's abstract)**

Keywords: *Climate hazards, PRECIS, Regional climate model, Cameron Highlands, Engineering*

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Behavior of V-Ti elements in warm-rolled transformation-induced plasticity steel with medium manganese content

Yu, Haicun, Cai, Zhaozhen, Ryom, Kwangchol, Fu, Guiqin, Zhu, Miaoyong

To reveal the law governing V-Ti precipitation behavior in warm-rolled transformation-induced plasticity (TRIP) steel, two steel samples including 0.072V-0.051Ti steel (Bear-V-Ti steel) and 0.001V-0.001Ti steel (Free-V-Ti steel) are designed. Based on a comparative analysis, the former has an excellent combination of mechanical properties including a total elongation (TE) of 37%, ultimate tensile strength (UTS) of 935 MPa, and $UTS \times TE$ of 34 GPa-% after annealing at a temperature of 650°C. The superior mechanical properties are attributable to particles that precipitate in a composite form of (V-Ti)C/N at 650°C. These particles can refine the grains and improve the tensile strength of Bear-V-Ti steel. However, it should be noted that the two roles of precipitates in steel are size dependent. For sizes between 10–20 nm, the role mainly entails pinning the dislocation. This accounts for the precipitation strength. As the size increases to 20–60 nm, the role mainly involves pinning of the grain boundary, which leads to fine crystal reinforcement. These results provide useful data for the production of medium manganese steel using the warmrolled process.

Keywords: *Medium-manganese steel, V-Ti, Warm rolling, Mechanical properties, Engineering*

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Bubble growth and floating behavior during degassing process of molten steel/(N₂, H₂) system **Zhang, Jie,**

Dissolved gas flotation method has been developed to remove inclusions in molten steel. The principle is that bubbles formed on inclusions by vacuum treatment of nitrogen or hydrogen supersaturated molten steel can carry the inclusions to slag. A kinetic model was constructed to analyze the bubble growth and floating behavior during the degassing process of the method, and its accuracy was verified by related experiments. The results show that pretreatment pressure, bubble nucleation depth and gas type have significant effects on bubble growth and floating, while vacuum treatment pressure and inclusion radius have little effects on it. The growth rate and floating velocity of bubbles increase with the increase of pretreatment pressure or the decrease of bubble nucleation depth. The growth rate and floating velocity of hydrogen bubbles are much larger than those of nitrogen bubbles. Calculation results indicate that the diameters of the bubbles are mostly 0.2–10 mm during floating process via this method. Moreover, the distribution of the bubbles nucleating on the inclusions is dispersive. In addition to the bubbles carrying inclusions to slag directly, these dispersive fine bubbles have a high probability of inclusion adhesion resulting in an improvement of the inclusion removal.

Keywords: *Dissolved gas flotation method, Inclusion removal, Kinetic model, Growth rate, Floating velocity, Engineering*

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Comparative assessment of different methods in generating design storm hyetographs for the Philippines

Aralar, Alexis B. , Veyra, Jr., Celso D. , Lasco, Jonathan David D. , Duka, Maurice A.

Design storm hyetographs are synthetic temporal rainfall patterns used as input for flood modeling studies, drainage design and hydrodynamic modeling. In practice, the Philippines adopts the alternating block (AB) method to derive hyetographs using PAGASA-synthesized rainfall intensity-duration-frequency (RIDF) curves. In this study, six other methods- AB from actual RIDF curve, actual normalized 24-hour storms and four different patterns derived by Huff (1967)- were tested using the tipping-bucket raingauge records of a local weather station. Nonparametric statistical tests were employed to determine the significant difference between and among distributions. Moreover, Chi-squared goodness-of-fit test was used to compare the hyetographs with data from actual storms. The PAGASA AB hyetographs, while accurate in some instances, do not always represent actual storms well. Furthermore, other methods may have better fits for other storms. This study recommends further research in establishing design hyetographs in the Philippines.

Keywords: *Design storm hyetograph, Alternating block, Huff, RIDF curve, Engineering*

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Coupled experimental study and thermodynamic modeling of the $\text{Al}_2\text{O}_3\text{--Ti}_2\text{O}_3\text{--TiO}_2$ system

Panda, Sourav Kumar , Jung, In-Ho

A complete critical evaluation and re-optimization of phase diagrams and thermodynamic properties of the $\text{Al}_2\text{O}_3\text{--Ti}_2\text{O}_3\text{--TiO}_2$ system at 1 atm pressure has been performed. Equilibration and quenching experiment in the $\text{Al}_2\text{O}_3\text{--TiO}_2$ system in air was also performed to constrain the solubility limit of Al_2O_3 in TiO_2 rutile solution at high temperatures. The molten oxide phase was described by the Modified Quasichemical Model considering the short-range ordering in molten oxide. While Al_2TiO_5 and Ti_3O_5 were treated as separate stoichiometric phases in the previous optimization, they were described in this study, using the Compound Energy Formalism, as part of pseudobrookite solid solution with a miscibility gap based on new experimental data. Corundum and rutile solutions were also described based on their crystal structures. New high temperature phase, $\text{Al}_6\text{Ti}_2\text{O}_{13}$, was also considered for the first time. A set of optimized model parameters of all phases was obtained, which reproduces all available and reliable literature data within experimental error limits from 25°C to above the liquidus temperatures under oxygen partial pressures from metallic saturation to 1 atm. The newly optimized database was applied to calculate the inclusion diagram and reoxidation of Al-killed and Ti bearing steels.

Keywords: *$\text{Al}_2\text{O}_3\text{--TiO}_2\text{--Ti}_2\text{O}_3$, Inclusion, Pseudobrookite, Phase diagram, Thermodynamic modeling, Engineering*

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Crystallisation of silicate glasses and melts with chemical compositions in primary phase region of gehlenite

Susa, Masahiro , Sasaki, Kodai , Yamauchi, Takaaki , Watanabe, Takashi , Endo, Rie , Hayashi, Miyuki , Hanao, Masahito

Crystallisation behaviour has been investigated on samples with two compositions: (A) $42\text{CaO-}37\text{SiO}_2\text{-}21\text{Al}_2\text{O}_3$ and (B) $43\text{CaO-}27\text{SiO}_2\text{-}19\text{Al}_2\text{O}_3\text{-}11\text{CaF}_2$ (all mass%). Composition (A) is within the primary phase region of gehlenite and composition (B) is just between gehlenite and cuspidine on a mass basis. Two types of sample were prepared from glassy and molten states for each composition. These samples were characterised by differential thermal analysis, X-ray diffraction analysis and electron probe microanalysis. Crystallised samples A from glassy state: It contained gehlenite and wollastonite in the XRD profile, and in BE images gehlenite crystals grew more largely than wollastonite, suggesting that gehlenite precipitates in preference to wollastonite. Crystallised samples B from glassy state: It contained cuspidine and gehlenite in the XRD profile. In BE images, cuspidine precipitated but gehlenite was not observed. Crystallised samples A from molten state: It contained only gehlenite in the XRD profile, and in BE images there was dendritic gehlenite developed across the sample. Crystallised samples B from molten state: It contained cuspidine and CaF_2 as well as gehlenite in the XRD profile. In BE images, gehlenite comprised the major part, and it is likely that gehlenite crystallises in preference to cuspidine. It is also likely that the pseudo-binary system of gehlenite and cuspidine forms eutectics and that the eutectic composition is rather closer to cuspidine. Consequently, the increase in Al_2O_3 concentration would little affect crystallisation of the glassy portion in actual mould fluxes containing CaF_2 but strongly affects crystallisation of the liquid portion.

Keywords: *Mould flux, Alumina pick-up, Crystallisation, Gehlenite, Cuspidine, High aluminium steel, Engineering*

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Crystallization kinetics and structure of $\text{CaF}_2\text{--CaO--Al}_2\text{O}_3\text{--MgO--TiO}_2$ slag for electroslag remelting

Zheng, Dingli

The crystallization kinetics and structure of $\text{CaF}_2\text{--CaO--Al}_2\text{O}_3\text{--MgO--TiO}_2$ slag for electroslag remelting (ESR) were investigated by differential scanning calorimetry and Raman spectroscopy, respectively. The results show that increasing TiO_2 content from 4.2 mass% to 16.8 mass% in the slag lowers the crystallization rate of the slag. The crystallization of the primary crystalline phase ($11\text{CaO}\cdot 7\text{Al}_2\text{O}_3\cdot \text{CaF}_2$) in the slags with 4.2–12.6 mass% TiO_2 , and primary crystalline phase ($11\text{CaO}\cdot 7\text{Al}_2\text{O}_3\cdot \text{CaF}_2$ and CaTiO_3) in slag with 16.8 mass% TiO_2 originates from constant nucleation rate, interface reaction controlled and one-dimensional growth, irrespective of the TiO_2 contents of the slag. Raman spectroscopy study indicates that TiO_2 plays a network-modifier role in relatively more complex Al–O–Al band and Q^4 units by forming Q^2 units and less complex TiO_4^{4-} chain unit, resulting the decreasing of the polymerization degree of the slag. The variation in slag structure is in agreement with the analysis of crystallization kinetics.

Keywords: *Crystallization kinetics, Structure, TiO_2 -bearing slag, Electroslag remelting, Engineering*

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Developing an energy audit for baseline and scenario analysis of a university library

Tamayao, Mili-Ann M. , San Miguel, Claudine Anne S. , Contreras, Mary Abigail M. , Caram, Francine Beatrice A. , Chan, Maxine Y.

In an academic university building, the library is one of the most used facilities as a place for studying and research. To further understand the energy use within the library, a baseline energy consumption profile was created by studying the different equipment in the facility as well as how often people would use them through an energy audit. Lighting and temperature of the area were also measured and compared to current standards for workplace productivity (200-500 lux and 22.5-25.5 °C). Given baseline estimates, recommendations were formulated to optimize electricity consumption within the library while reducing corresponding CO_2 emissions and power costs. Recommendations are expected to result in a significant decrease in total monthly energy consumption of the university library, amounting to Php 54,507/month electricity cost savings and 2.59 ktCO_2 in monthly CO_2 emissions reduction.

Keywords: *Power Consumption, Library, Energy Efficiency, Energy Audit, Engineering*

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Development of ADEM-SPH coupling model for analysis of solid to liquid phase transition behaviors

Isihihara, Shingo, Kano, Junya

A new simulation model for the analysis of solid to liquid phase transition behaviors inside the blast furnace was developed in this study. The solid state is treated by ADEM (Advanced Distinct Element Method) and the liquid state is treated by SPH (Smoothed particle Hydrodynamics). The intermediate state is treated by overlapped calculation of both ADEM and SPH. Numerical examinations for the analysis of several phenomena such as dam brake flow, droplet deformation due to the contact angle and phase transition were performed. The validity of the proposed model was confirmed by comparison with the experimental results of the motion of the leading edge in collapse of a water column in the dam break test. The phase transition behavior of ore was observed experimentally using horizontal furnace. The deformation started at about 1 200°C from the upper corner of sample pellet became round, and melted down to the whole with slight contraction. A similar behavior is also can be seen in the simulation by appropriately setting the relationship between the temperature and the joint spring coefficient. These results are indicated that the developed model has possibility to clarify the burdens behavior including the phase transition inside the blast furnace.

Keywords: *ADEM, SPH, Blast furnace, Melting, Phase transition, Engineering*

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Development of analysis method for sulfide in steel with chelating agent of copper

Mizukami, Kazumi, Itabashi, Daisuke, Aimoto, Michihiro, Nishifuji, Masayuki

Copper sulfide (Cu_xS) has been frequently observed in steel samples, prepared using selective potentiostatic etching by electrolytic dissolution (SPEED). It is often the case that Cu_xS is detected unexpectedly from the precipitates extracted from steel samples by selective potentiostatic etching, although such Cu_xS formation during the heat treatment conducted is not anticipated by the thermodynamic equilibrium calculations. In this study, we observed such artificial Cu_xS along with manganese sulfide (MnS) precipitates, which were extracted from steel materials by SPEED, using secondary electron microscope (SEM) equipped with energy dispersive X-ray spectroscopy (EDX) and Auger electron spectroscopy. These Cu_xS –MnS sulfide complex would be formed by the following mechanism: as the solubility of Cu_xS is far bigger (*i.e.* 10 times or more) than that of MnS, Cu^{2+} ion dissolved from steel matrix would be exchanged with Mn^{2+} ion on the MnS surface during the etching process, leading to a formation of Cu_xS –MnS sulfide complex. In order to suppress the formation of such Cu_xS , we propose the use of following electrolyte: a nonaqueous solution of 4% methyl salicylate + 1% salicylic acid + 1% tetramethylammonium chloride (TMAC) + 5% Triethylenetetramine (TET) in volume fraction, in methyl alcohol (Cu ion selective hold etching by electrolytic dissolution, abridged as CUSH electrolyte). Then, this electrolyte was applied to precipitates in steel samples. It was effective to prevent the formation of sulfides in electrolyte, with the effect of metallic (Cu^{2+} , Ag^+ , Pb^+ , *etc.*) chelating ability of TET.

Keywords: *Copper sulfide, Inclusion, Speed method, SEM, AES, Triethylenetetramine, Electrolytic dissolution, CUSH, Engineering*

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Development of wide-range viscometer and the viscosity measurement for $\text{SiO}_2\text{--Na}_2\text{O--NaF}$ system

Takeda, Osamu, Yamada, Masaya, Kawasaki, Masane, Yamamoto, Mayu, Sakurai, So, Lu, Xin, Zhu, Hongmin

A rotating crucible viscometer previously developed by the authors was improved in order to measure wide-range of viscosity values with high reliability. Two sets of inner cylinder and crucible with different geometries were employed as an attempt to accomplish this objective. The centers of these components were matched with accuracy of ± 0.1 mm by adopting X-Y stage for positioning. Relative error in torque measurement was less than 1.5%, and calibration curves had a good consistency for all experiments. By using the improved viscometer, a typical molten salt, $\text{LiF--10 mol\% NaF--45 mol\% KF}$ (FLiNaK), a hightemperature low viscosity liquid, was measured and the results agreed with the theoretical values estimated from pure substances relations. Viscosity of the $\text{SiO}_2\text{--Na}_2\text{O--NaF}$ system ($C_{\text{Na}_2\text{O}}/C_{\text{SiO}_2} = 0.67$ in mol%) was obtained by varying concentration range from 0 to 80 mol% NaF. All melts' composition tested followed Arrhenius-type temperature dependence, and a viscosity relation at 1 473 K based on composition was also obtained. Drastic decreases in activation energy for viscous flow were observed at the concentrations of 5 and 80 mol% NaF.

Keywords: *Viscosity, Rotating crucible method, Mold flux, ESR slag, LiF-NaF-KF, SiO₂-Na₂O-NaF, Oxyfluoride melt, Engineering*

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Dissolution behavior of SiO_2 into molten CaO--FeO phase

Miki, Takahiro, Kawakami, Akito

Generally, reactions and forming phases during ironmaking can be thermodynamically predicted using equilibrium phase diagram. However, at low temperature it will likely to be different from predicted phases and deviate from equilibrium. Hence, knowledge of solid state reaction at low temperature is required to control the melting behavior of slag phase in blast furnace. Formation of $2\text{CaO}\cdot\text{SiO}_2$ by the reaction between gangue SiO_2 and liquid CaO--FeO phase will give negative effect to molten slag formation during ironmaking process, and enhancing the dissolution of SiO_2 into CaO--FeO liquid phase is crucial. It was found that $2\text{CaO}\cdot\text{SiO}_2$ phase layer formed at the interface between SiO_2 and CaO--FeO melt by rapidly heating the sample to 1 423 K. Dissolution of SiO_2 into CaO--FeO melt was enhanced by Al_2O_3 addition to the CaO--FeO melt. When the sample was rapidly heated to 1 473 K, formation of $2\text{CaO}\cdot\text{SiO}_2$ was not observed and the dissolution of SiO_2 into CaO--FeO liquid phase was significant. Rapid heating to 1 473 K will avoid formation of $2\text{CaO}\cdot\text{SiO}_2$ phase and enhance melting of gangue minerals to form liquid slag.

Keywords: *Reaction, Phase, Dissolution, Gangue, Minerals, Engineering*

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Effect of aluminum on the solubility of calcium in liquid iron at low calcium and aluminum contents

Berg, Martin

The solubility of calcium in liquid iron as a function of aluminum content and calcium potential, at compositions relevant to production of aluminum killed steels, was studied experimentally at 1 873 K. The measurements were made using a closed molybdenum chamber in which iron-aluminum alloys were held. The calcium potential was fixed using pure liquid calcium held at different temperatures. The calcium contents in the iron varied between 6 and 22 ppm by weight and the aluminum contents varied between 70 and 1 900 ppm by weight. The results indicate that the effect of aluminum on the solubility of calcium in iron is very low in the composition ranges studied.

Keywords: *Iron, Calcium, Aluminum, Activity measurement, Engineering*

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Effect of high nitrogen addition on microstructure and mechanical properties of As-cast M42 high speed steel

Jiao, Weichao, Li, Huabing, Feng, Hao, Jiang, Zhouhua, Dai, Jing, Zhu, Hongchun, Zhang, Shucui, Chu, Mansheng, Wu, Wei

This study systematically investigated the influence of high nitrogen (N) addition (0.205 wt.%) on microstructure and mechanical properties of as-cast M42 high speed steel. The results demonstrate that the conventional and high-nitrogen M42 cast ingots are mainly composed of martensite, retained austenite and various precipitates (M_2C , M_6C as well as MC in M42 cast ingot or $M(C, N)$ in M42N cast ingot). The addition of N could increase the retained austenite content, trigger the transformation of MC to $M(C, N)$, favor the formation of M_2C at the expense of M_6C , and improve the distribution uniformity of M_6C at the macroscopic scale. Moreover, the addition of N could lead to the reduction of the secondary dendrite arm spacing as well as the decrease of the thickness and area fraction of eutectic carbides, and improve the distribution uniformity of eutectic carbides at the microscopic scale. The $M(C, N)$ particles form directly from the liquid phase prior to the formation of primary austenite, which could act as the heterogeneous nuclei of primary austenite and thus promote the refinement of the as-cast microstructure. The addition of N slightly decreases the macro-hardness and ultimate compression strength of the cast ingot but increases its ductility, which could be ascribed to the increase of retained austenite content and the reduction in the amount of eutectic carbides. Therefore, high N addition can significantly improve the as-cast microstructure of M42 high speed steel, which is promising for the further enhancement of the mechanical property and service life of the final product.

Keywords: *M42 high speed steel, Pressurized metallurgy, Nitrogen, As-cast microstructure, Precipitates, Mechanical property, Engineering*

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Effect of nitrogen-less reducing atmosphere on permeability of cohesive layer in blast furnace

Kawashiri, Yuki, Nouchi, Taihei, Matsuno, Hidetoshi

Recently, demands for reduction of CO₂ gas emission in iron making process are increasing. For further reduction of CO₂ gas emission, a method of capturing carbon dioxide from blast furnace exhaust gas has been studied. The oxygen blast furnace using pure oxygen for blast does not contain nitrogen in the exhaust gas and that is more advantageous than conventional blast furnace in the point of view of CO₂ separation energy. Although the oxygen blast furnace has been studied with the experimental furnace, the experimental furnace was not sufficiently investigated on the properties of cohesive layer because of the small load of burden materials. Therefore, in this study, the properties of cohesive layer of the oxygen blast furnace were studied. The properties of the cohesive layer were evaluated under blast furnace conditions and nitrogen-less conditions in a load-softening test. As a result, the properties of cohesive layer were remarkably improved in nitrogen-less conditions. As a result of discussion, improvement of the properties of cohesive layer was quantitatively explained due to suppression of contraction of the sintered ore and the decrease of slag liquid because the nitrogen-less atmosphere promoted reduction reaction.

Keywords: Blast furnace, CO₂ emission, Cohesive layer, Cohesive zone, Oxygen blast furnace, Engineering

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Effect of pre-reduction degree on softening behavior of simulant sinter iron ore

Ohno, Ko-ichiro, Konishi, Hirokazu, Watanabe, Takashi, Isihara, Shingo, Natsui, Shungo, Maeda, Takayuki, Kunitomo, Kazuya

Reduction test under load is normally applied to evaluate softening and melting behaviour of ferrous burdens at simulated condition in cohesive zone in blast furnace. Outcomes from this test are very complex because they depend on reduction degree, chemical composition, basicity, melts physical property, etc. One of the reasons to make complex this test is sample for the test provided as particle packed bed. In order to comprehend softening and melting behaviour of cohesive zone, focus on behaviour of single particle as a component of particle packed bed in this study. For simplification, a pre-reduced simulant sinter iron ore was prepared as single tablet sample. The samples were made from mixture of reagent oxides and they were pre-reduced to control their reduction degree to several reduction levels. The tablet sample was rapidly heated up to 900°C, and then gradually heated up with 10°C/min under inert gas atmosphere and 0.1 MPa load. Shrinkage degree of the sample was measured during the softening and melting test, and quenched sample was made at certain temperature when the sample shows a characteristic tendency. Cross-sectioning observation of the quenched sample provided mineral phases distribution in the tablet sample. The observation indicated that peripheral structure has a significant effect on deformation resistance. Especially in there, existence of molten slag phase could make easy to deform the sample particle shape, and metallic solid Fe phase helped to strengthen the particle's deformation resistance.

Keywords: Cohesive zone, Softening behavior, Simulant sinter iron ore, Rapid heating and quenching, Deformation resistance, Pre-reduced sample, Mineral phases distribution, Engineering

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Effect of solute elements on boron segregation in boron-containing steels

Luitjohan, Kara , Krane, Matthew , Johnson, David

The addition of boron to steel alloys results in an increase in both hardenability and casting defects. The casting difficulties are predicted to stem from a metatectic reaction, $\delta + \text{Fe-} \text{B} \rightarrow \text{L} + \text{Fe-} \text{B}$, where a fully solidified material begins to locally remelt as the temperature decreases. Another possible source of casting defects is a boride-rich phase that is predicted to remain liquid at low temperatures. To experimentally determine which reaction is the likely source of the casting defects, the predicted reactions and the effect of solute elements on those reactions are investigated. Levitation zone melting is used to control segregation in a ternary Fe–C–B alloy and a commercial 22MnB5 alloy. Carbon segregation and a peritectic reaction result in a peritectic jump during directional solidification where the first directionally solidified (DS) zone undergoes δ -bcc solidification followed by a peritectic jump to steady state planar solidification of $\text{Fe-} \text{B}$ -fcc in the second DS zone. The presence of other solute elements in the zone melted 22MnB5 alloy lead to a breakdown in the planar solidification front before steady state solidification could be achieved in the second DS zone. With a cellular solid/liquid interface, boron-rich intercellular liquid formed low melting iron boro-carbide particles. The controlled solidification conditions in a levitation zone melter were unable to prevent ~0.003 wt% boron from segregating to high enough levels to form boride particles. Therefore, it is likely that during commercial casting, the formation of the low melting boride phase from interdendritic segregation is a key source of the casting issues.

Keywords: *Directional solidification, Peritectic jump, Boron segregation, Engineering*

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Effect of the silicate structure on calcium elution behaviors of calcium-silicate based mineral phases in aqueous solution

Ruan, Fang, Kawanishi, Sakiko, Sukenaga, Sohei, Shibata, Hiroyuki

In this study, the effect of the silicate structure of calcium-silicate based mineral phases on their Ca elution behaviors into water was investigated. The Ca elution behaviors of Ca-silicate based mineral phases with different skeleton silicate structures in ion-exchanged water were analyzed using the powder leaching test. The elution amount of Ca was in the order alite (Ca_3SiO_5) > belite (Ca_2SiO_4) > rankinite ($\text{Ca}_3\text{Si}_2\text{O}_7$) > pseudowollastonite ($\alpha\text{-CaSiO}_3$) > wollastonite ($\beta\text{-CaSiO}_3$) > cuspidine ($\text{Ca}_4\text{Si}_2\text{O}_7\text{F}_2$) > diopside ($\text{CaMgSi}_2\text{O}_6$) > hedenbergite ($\text{CaFeSi}_2\text{O}_6$) > tremolite ($\text{Ca}_2\text{Mg}_5\text{Si}_8\text{O}_{22}(\text{OH})_2$) > anorthite ($\text{CaAl}_2\text{Si}_2\text{O}_8$). This suggests that the elution amount of Ca decreased with the skeleton silicate structure became more complicated.

Keywords: *Ca elution behavior, Silicate structure, Steelmaking slag, Engineering*

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Energy savings and carbon emission reduction of smart lighting installation in a multipurpose and residential building in Santiago de Compostela, Spain

Diaz, Alfonso Lopez, Fontaiña, Eduardo Fernandez, Lopez, Gabriel Pereiro, Silva, Fernando

The excessive emissions of greenhouse gases into the atmosphere has increased the global average temperature resulting to a phenomenon known as global warming. One of the major greenhouse gasses is CO₂ and the various efforts are focused on curbing its emissions. Using the case of a multipurpose and residential building at the University of Santiago de Compostela in Northwestern Spain, this study assessed the environmental impact of installing smart lighting. This study quantifies the CO₂ emission reduction, and economic cost associated to the technical improvement. Such action resulted to saving 126 MWh and a reduction of carbon emissions of 25 T annually, with a return period of six years.

Keywords: *Efficient lighting, Energy saving, Greenhouse effect, Residential lighting, Engineering*

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(Filipiniana Analytics)
NP

Enhanced Faster Region Convolutional Neural Networks for Steel Surface Defect Detection

Wei, Rubo, Song, Yonghong, Zhang, Yuanlin

Bar steel surface defects detection is very important to steel production and quality control. Many traditional computer vision methods have been applied to industrial defects detection, but they are usually environmentally sensitive and not robust enough. In this paper, a deep learning defects detection method based on Faster Region Convolutional Neural Networks (Faster R-CNN) is proposed. Firstly, to solve the problem of missed detection of a large number of small defects, we introduce Weighted Region of Interest (RoI) Pooling instead of RoI pooling, which eliminates the area misalignment caused by the two quantization processes in the latter, and the small defects detection rate is significantly improved. Secondly, considering that most of the defects are irregular in shape, we use deformable convolution in upper layers to adapt to various shapes by learning the positional offset in convolution. Thirdly, owing to the diversity of bar steel defects, multi-scale feature extraction network with Feature Pyramid Networks (FPN) is proposed to build feature pyramids. Finally, we propose Strict-Non-Maximum Suppression (Strict-NMS) algorithm to reduce overlapping bounding boxes as much as possible. Experiments on defect datasets in real industrial environments show that the detection rate of this method can reach 97%, which is much higher than state-of-the-art methods.

Keywords: *Defect detection, Faster R-CNN, FPN, Deformable convolution, RoI pooling, Engineering*

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Estimation of particle segregation behavior in ore-coke mixed layer using screening layer model

Terui, Koki, Ichikawa, Kazuhira, Kashiwara, Yusuke

To achieve low RAR operation by coke mixed charging, it is important to control coke segregation behavior in mixed layer at blast furnace top. In this study, a numerical simulator based on screening layer model was developed to estimate the distribution of mixed coke ratio in mixed layer. The results are summarized as follows: (1) The parameters required for the screening layer model to estimate the segregation behavior of the burden materials were determined by PIV test and numerical fitting. (2) The screening layer model containing parameters obtained by experiments and fittings was taken into the blast furnace burden distribution simulator. The simulation results showed that the distribution of mixed coke ratio of the small coke in the ore can be accurately estimated under the charging conditions of the actual furnace. (3) The influence of the difference in tilting direction of the rotating chute on the distribution of mixed coke ratio was evaluated. In the reverse tilting, the radial distribution of the mixed coke ratio became more uniform as compared with the forward tilting charging. Therefore, it is considered that reverse tilting is more effective for carrying out coke mixed charging.

Keywords: Blast furnace, Coke mixed charging, Burden distribution, Numerical simulation, Engineering

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Evaluation of object-based classification methods for mapping benthic habitats using bathymetric LiDAR derivatives

Blanco, Ariel, Cruz, Charmaine, Go, Gay Amabelle, Estabillo, Mia Shaira, Cadalzo, Ivy Elaine, Tamondong

Benthic habitats are one of the most productive ecosystems in existence. Unfortunately, they are declining in coverage globally due to natural and anthropogenic factors. Mapping and monitoring the status of these coastal ecosystems is critical for their protection. One of the tools capable of mapping such habitats is LiDAR remote sensing. This research aims to evaluate different object-based classification methods for classifying benthic habitats in Manicani Island, Guiuan, Eastern Samar using LiDAR derivatives. The bathymetric LiDAR data used in this research was obtained using an Optech Aquarius ALTM sensor. Before classification, LiDAR derivatives such as digital surface model (DSM), depth, plan curvature, profile curvature, rugosity, slope, slope of slope, broad-scale and fine-scale Bathymetric Position Index (BPI), and fractal dimension were extracted from the raw data. Principal components analysis was applied to eliminate redundant information. To classify the benthic habitats, an object-based image analysis (OBIA) approach was performed using eCognition. Training and validation data sets utilized in classification and accuracy assessment were gathered in the field using a handheld GPS receiver and video tows geotagged using a dual-frequency GPS receiver. The overall accuracies achieved in mapping benthic habitat from LiDAR derivatives were as follows: Hierarchical – 77.4%, Nearest Neighbor – 88.3%, Feature Space Optimization (FSO) – 82.4%, and SEparability and Thresholds (SEaTH) – 81.9%.

Keywords: Benthic habitat mapping, Bathymetric LiDAR, OBIA, Hierarchical classification, Nearest neighbor, FSO, SEaTH, Engineering

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NP

Experimental evaluation of interfacial free energy of solid iron

Hanao, Masahito

Interfacial free energy of solid iron was experimentally evaluated for solid/liquid interface and grain boundary of austenite phase in solid Fe/liquid FeO–SiO₂ system. Multi-phase equilibrium method was adopted and two kinds of angles such as dihedral angle between solid/liquid interface and grain boundary, and contact angle of sessile drop of molten oxide on solid iron were measured. On the basis of experimental results and literature data of activity of FeO, surface tension of liquid FeO–SiO₂ oxide and solid Fe, interfacial tension (interfacial free energy) of solid/liquid interface and grain boundary of γ -Fe were evaluated. Oxygen partial pressure in the experimental atmosphere was evaluated as 1×10^{-12} – 10^{-11} atm. Under this condition, solid/liquid interfacial free energy was evaluated as 1 440–1 500 mJ/m² and grain boundary free energy of γ -Fe as 860–940 mJ/m² at 1 350°C. The evaluated value for the grain boundary was agreed well with the data of previous works.

Keywords: *Interfacial tension, Interfacial free energy, Solid/liquid interface, Grain boundary, Dihedral angle, Contact angle, γ -Fe FeO-SiO₂, Engineering*

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Flow stress measurement and dynamic response analysis of hot compression test machine at high strain rates

Park, Hyeon-Woo, Kim, Kyunghyun, Park Hyung-Won, Yanagimoto, Jun

Flow stress is the most important information for hot strip rolling as it affects the rolling force and the thickness of the rolled product. A high-speed compression test up to a strain rate of 300 s^{-1} , which is the compression speed of $3\ 600 \text{ mm} \cdot \text{s}^{-1}$ for a 12-mm-high cylindrical specimen, is necessary as a strain rate of 100 – 300 s^{-1} is the normal rate in the production of hot-strip-rolled steel sheets. An experiment is conducted using a servo-hydraulic compression test machine, which enables a high compression speed and a high temperature, but the oscillation is observed in stress-strain curve at high strain rate over 50 s^{-1} . To determine the natural frequency of the compression test machine, the Savitzky–Golay filtering method is used for regression and the fast Fourier transformation (FFT) is adopted. To explain the mechanism of this phenomenon, a spring–mass–damper model is used and the results are compared with the FFT analysis result. After eliminating oscillation on the time versus load curve, a flow curve is obtained by inverse analysis, which compensates for the nonuniform strain rate, the inhomogeneous distribution of deformation, and the temperature increase during deformation.

Keywords: *High strain rate, Hot compression test machine, Flow stress, Oscillation, Inverse analysis, Engineering*

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Fluid dynamics analysis of O₂–CaO jet with a shrouding flame for eaf steelmaking

Wei, Guangsheng, Peng, Yuhua, Zhu, Rong, Yang, Lingzhi, Wu, Xuetao

Compared with the traditional addition methods of lumpy lime into the electric arc furnace (EAF) for slag making, the technology of O₂–CaO jet can deliver lime powder directly into the EAF molten bath with high speed carrier gas, which demonstrates much advantages in quick melting and effective phosphorus removal. Recently, the shrouding combustion flame was proposed and applied to strengthen the CaO import capability of the O₂–CaO jet. In this study, combining the discrete particle model (DPM) and the Eddy Dissipation Concept (EDC) model with the detailed chemical kinetic mechanisms (GRI-Mech 3.0), computational fluid dynamics (CFD) models of the O₂–CaO jet with shrouding flame, with shrouding O₂ and without shrouding gas were developed. The numerical results of CFD models were firstly validated by the experimental data. The interaction between the particles and the gas jet of the O₂–CaO jet was analyzed and how the shrouding combustion flame affected the fluid flow characteristics of the O₂–CaO jet were clarified. The shrouding high-temperature combustion flame could delay the attenuation of the axial velocity of the O₂–CaO jet, heat the CaO particles effectively and make the CaO particles cluster together in a much longer distance, which is helpful to strengthen the jet impact, accelerate the meltdown of CaO particles and improve the utilization efficiency of CaO.

Keywords: *EAF steelmaking, O₂-CaO jet, Shrouding flame, Numerical simulation, Engineering*

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Formulation of Shrinkage Rate of Sinter during Softening Process

Yasuda, Naoto, Nishioka, Koki, Nomura, Seiji

In order to clear shrinkage behavior of sinter during softening process, the effects of load and reducing gas condition on the shrinkage rate of sinter packed bed has been investigated using an experimental apparatus for measuring high temperature properties under load. As a result, the shrinkage rate increased with increasing the load impressed to the packed bed in temperature range from 1 270 to 1 440 K, and decreased with increasing the reduction degree of sinter in temperature range from 1 470 to 1 570 K. The results indicate that the mechanism of shrinkage was different depending on temperature. In this study, the shrinkage rate of sinter was formulated by dividing into two temperature regions. In the region I, the shrinkage rate increased in proportional to the impressed load, and increased in inversely proportional to the apparent softening viscosity. In the region II, the shrinkage rate increased in proportion to the generation rate of melt, and decreased with increasing the volume fraction of metallic iron in the packed bed. The shrinkage in region II was suppressed with increasing the reduction degree of sinter since the generation rate of melt decreased and the volume fraction of metallic iron increased. The shrinkage rate of each region was expressed as functions of initial composition of sinter, load, temperature, and reduction degree. The calculated values were in good agreement with the experimental ones.

Keywords: *Blast furnace, Softening-melting property, Shrinkage rate, Softening viscosity, Melt generation, Engineering*

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Friction stir welding of medium carbon steel with laser-preheating

Wada, Takuya, Morisada, Yoshiaki, Sun, Yufeng, Fujii, Hidetoshi, Kawahito, Yousuke, Matsushita, Muneo, Ikeda, Rinsei

Friction Stir Welding (FSW) has expanded to many metallic materials with higher melting points or much higher strength than the aluminum alloys. If the tool travels too quickly along the welding seam during the welding process or if the melting point of the workpiece is high, the frictional heat generated between the tool and the workpiece may not be sufficient to cause material flow. Insufficient heat input results in the formation of groove or tunnel-shaped defects in the stir zone and also severe wear or breaking of the FSW tool. To solve these problems, a higher heat input is required to soften the materials. Therefore, several preheating methods have been adopted to increase the heat input. In this study, a fiber laser was used as the preheating source during the FSW. In this experiment, the effect of the laser-preheating on the defect formation and tool rotational torque during the FSW was investigated. Additionally, a difference in the material flow during the conventional FSW and laser-preheating FSW was observed by two pairs of X-ray transmission real-time imaging systems. As a result, it was found that the laser preheating reduced the defect formation and the tool rotational torque during the FSW. Furthermore, laser beam irradiation on the retreating side (RS) was the most effective in reducing the defect formation. On the other hand, the irradiation on the advancing side (AS) was the most effective in reducing the tool rotational torque.

Keywords: *Friction stir welding, Laser-preheating, Material flow, Tool rotational torque, Carbon steel, Three-dimensional visualization, X-ray radiography, Engineering*

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Gas permeability evaluation of granulated slag particles packed bed during softening and melting stage with Fanning's equation

Ohno, Ko-ichiro, Kitamura, Yoshiki, Suenaga, Sohei, Natsui, Shungo, Maeda, Takayuki, Kunitomo, Kazuya

Negative effect from low coke rate operation at cohesive zone is obvious because it makes thinning of coke slit thickness. Correct knowledge about gas permeability of cohesive layer is becoming more and more important. In order to precisely understand cohesive behaviour, a softening and melting simulator under rapid heating and quenching conditions was applied for clarify a determinant factor of gas permeability behaviour. To focus on softening and melting behaviour, granulated slag particle bed layer without iron oxide was prepared as packed bed sample layer can show softening and melting. The packed bed slag samples in graphite crucible were rapidly heated up to 1 200°C, and then gradually heated up to 1 500°C with 10°C/min under inert gas atmosphere and 0.1 MPa load. Gas pressure drop and shrinkage degree of the sample layer were measured during the softening and melting test, and quenched sample was made at certain temperature when the maximum gas pressure drop was measured. The CT observation of the quenched sample provided 3D shape information of gas path shape in sample packed bed. Gas pressure drop was estimated with fanning's equation with the gas path information. The estimation values were shown positive correlation with measured maximum pressure drop. The CT observation also gave triple line length among molten slag, graphite, and gas. Combination the triple line length and molten slag surface tension could use for evaluation of static force balance when maximum pressure drop obtained.

Keywords: *Cohesive zone, Softening and melting, Gas pressure, CT scanning, Rapid heating and quenching, Slag surface tension, Fannings equation, Triple line, Capillary force, Engineering*

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Gas permeability improvement mechanism at the blast furnace cohesive zone by mixed coke charging in ore layer and effect of coke mixing for different cohesive zone condition on gas permeability

Yakeya, Masahiro, Kasai, Akito, Tadai, Rikizo, Nozawa, Kentaro

A major operational problem in increasing pulverized coal rate and decreasing coke rate must be the increased pressure drop or the worsened gas permeability at the lower part of the blast furnace. In order to decrease the pressure drop at the blast furnace cohesive zone (CZ) under low coke rate operation, this study has focused on mixed coke charging in the ore layer. Results obtained by numerical analysis and experiments are as follows: (1) Numerical analysis using DEM (Discrete Element Method) clarified the change in the cohesive ore bed structure with mixed coke charging and the formation conditions of gas path in the bed. Also, DEMCFD (DEM and Computational Fluid Dynamics) analysis enabled us to find a gas permeability improvement mechanism and an optimum coke mixing ratio for different CZ conditions before applying the technology. (2) Experiments in blast furnace hot model demonstrated the decreased pressure drop at the CZ by mixed coke charging in the ore layer. The experimental results abided by the numerical analysis results.

Keywords: *Ironmaking, Blast furnace, Cohesive zone, Mixed coke charging, Coke slit, Gas permeability, Engineering*

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Growth behavior of a mechanically long fatigue crack in an FeCrNiMnCo high entropy alloy: a comparison with an austenitic stainless steel

Mizumachi, Shunsuke, Koyama, Motomichi, Fukushima, Yoshihiro, Tsuzaki, Kaneaki

The fatigue crack growth characteristics of an Fe20Cr20Ni20Mn20Co high-entropy alloy (HEA) were investigated by ΔK increasing compact tension test in comparison with SUS316L. The fatigue crack growth rate of the HEA was lower than that of the SUS316L. The predominant crack growth path was the grain interior for both alloys. A difference was observed in the crack roughness; *i.e.*, the fatigue crack growth path of the HEA was more distinctly deflected than that of the SUS316L. This indicates that roughness-induced crack closure is a key factor reducing the crack growth rate of the HEA. Another key factor is the noncrystallographic transgranular crack growth mechanism. The SUS316L exhibited crack growth via crack blunting/re-sharpening, while the HEA exhibited transgranular crack growth associated with dislocation substructure alignment.

Keywords: *High-entropy alloy, Austenitic steel, Fatigue, Compact tension test, Microstructure evolution, Engineering*

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Growth of initial clog deposits during continuous casting of Ti-ULC steel – formation and reduction of the initial deposits at nozzle/steel interface

Lee, Joo-Hyeok, Kang, Youn-Bae

In order to elucidate a nozzle clogging mechanism during continuous casting of Ti-ULC (Ti containing Ultra Low C) steel, a series of experiments employing a rotating finger method was employed. In the context of the carbothermic generation of CO – oxidation of Ti-ULC steel at the interface between the nozzle and the liquid steel – reduction of Fe_2O_3 in the oxidized product composed of $\text{Fe}_2\text{O}_3\text{--Al}_2\text{O}_3\text{--TiO}_x$ (“FAT”) by the liquid steel, the FAT was intentionally coated on usual nozzle refractories (“CZ”). It was found that the refractory components (CaO , ZrO_2 , SiO_2) rapidly dissolved into the FAT. The Fe_2O_3 in the FAT was rapidly reduced by Al and Ti in the Ti-ULC steel. As a result, reduced Fe metallic droplets mixed with $\text{CaO--Al}_2\text{O}_3\text{--TiO}_x\text{--ZrO}_2\text{--SiO}_2$ oxide were found as the clog deposit. This was in good agreement with the previous reports. In case of pure liquid Fe, the Fe_2O_3 was not reduced but remained in the deposit. A likely reaction mechanism for the growth of the initial clog deposit was proposed.

Keywords: *Nozzle clogging, Ti-ULC steel, Reoxidation, Reduction, Continuous casting, Engineering*

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2020,
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Hazards index analysis of gamma emitting radionuclides in selected areas around the uranium mine sites at Erongo Region, Namibia

Kgabi, Nnnesi Anna, Njinga, Raymond Limen, Tshivhase, Victor Makondelele, Zivuku, Munyara

This study measures the ^{226}Ra , ^{232}Th and ^{40}K activity concentrations using gamma spectrometry to assess first order exposure risks for the persons residing in Walvis Bay and Swakopmund towns in Erongo Region, Namibia. The concentrations of ^{226}Ra , ^{232}Th and ^{40}K in the soil samples vary from 14.94 Bq kg^{-1} to 48.24 Bq kg^{-1} , 17.68 Bq kg^{-1} to 52.51 Bq kg^{-1} and $162.58 \text{ Bq kg}^{-1}$ to $259.35 \text{ Bq kg}^{-1}$, respectively, with average values of $30.38 \pm 11.28 \text{ Bq kg}^{-1}$, $32.58 \pm 10.09 \text{ Bq kg}^{-1}$ and $203.62 \pm 27.00 \text{ Bq kg}^{-1}$ in Walvis Bay town. For Swakopmund town, the concentrations vary from 71.38 Bq kg^{-1} to $155.80 \text{ Bq kg}^{-1}$, 41.63 Bq kg^{-1} to $131.58 \text{ Bq kg}^{-1}$ and $360.82 \text{ Bq kg}^{-1}$ to $761.76 \text{ Bq kg}^{-1}$, respectively, with average values of $99.59 \pm 24.39 \text{ Bq kg}^{-1}$, $90.90 \pm 31.99 \text{ Bq kg}^{-1}$ and $553.07 \pm 107.17 \text{ Bq kg}^{-1}$. The radium equivalent activity (R_{eq}) calculated for the same composite soil samples varies from 62.14 Bq kg^{-1} to $126.69 \text{ Bq kg}^{-1}$ with an average value of 92.64 Bq kg^{-1} in Walvis Bay town. In Swakopmund town, it varies from $172.32 \text{ Bq kg}^{-1}$ to $332.66 \text{ Bq kg}^{-1}$ with an average value of $273.43 \text{ Bq kg}^{-1}$. The average values of absorbed dose and annual effective dose (outdoors) are found to be 42.20 nGy h^{-1} and $123.98 \text{ nGy h}^{-1}$, 0.05 mSv y^{-1} and 0.15 mSv y^{-1} in Walvis Bay and Swakopmund towns, respectively. The average excess lifetime risks of cancer (ELRC) in Walvis Bay and Swakopmund towns were 1.81×10^{-4} and 5.33×10^{-4} , respectively. This implies that 1 person out of 5555 persons in Walvis Bay town and 1 person out of 1876 persons in Swakopmund town may be affected of cancer related diseases.

Keywords: *Composite soil, Radionuclides, Enhanced radionuclides, ^{226}Ra , ^{232}Th , ^{40}K , Engineering*

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2016,
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NP

Heterogeneous nano-structure and its evolution in heavily coldrolled SUS316LN stainless steels

Watanabe, Chihiro, Kobayashi, Shuhei, Aoyagi, Yoshiteru, Todaka, Yoshikazu, Kobayashi, Masakazu, Sugiura, Natsuko, Yoshinaga, Naoki, Miura, Hiromi

Evolution of heterogeneous nano-structure in heavily cold-rolled SUS316LN stainless steels was investigated in detail. Transmission electron microscopic observations from the transverse direction (TD) of the 92% rolled specimen revealed the formation of a typical hetero-nano structure composed of ultra-fine lamellar grains embedded with deformation twin domains. The twin domains had prolate ellipsoidal shape elongated parallel to TD. Two types of twin domains with different crystallographical orientations to matrices could be identified, *i.e.*, i) $\langle 211 \rangle$ // rolling direction (RD) and $\langle 110 \rangle$ // TD or ii) $\langle 110 \rangle$ // RD and $\langle 211 \rangle$ // TD, although all the $\{111\}$ twinning planes of both twin domains were oriented nearly parallel to the rolling planes. The ultra-fine lamellar grains were elongated along $\langle 100 \rangle$ direction and nearly parallel to RD. Deformation twins with a few nano-meter spacing were also frequently observed to develop in the lamellar grains. Evolution sequence of the hetero-nano structure during cold rolling was also investigated. At an early stage of rolling, deformation twins were gradually formed in the whole grains. Then, the regions fragmented grains by twins were further subdivided by a numerous number of shear bands inclined at about 20–45° from the RD, resulting in the formation of “eye-shaped” twin domains surrounded by shear bands and their crystallographical rotation. Cold rolling up to 50% caused a considerable increase in strength and decrease in ductility. While the strength was raised more with increasing reduction up to 92%, both the strength and ductility eventually slightly decreased by further rolling.

Keywords: Heavy cold rolling, Heterogeneous nano-structure, Austenitic stainless steels, Microstructure, Engineering

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Hydrologic impact evaluation of land use and land cover change in Palico Watershed, Batangas, Philippines using the SWAT model

Bantayan, Nathaniel C. , Briones, Romel U., Ella, Victor B.

Information on the relationship between hydrologic response and land use and land cover change (LULC) is vital for proper management of water resources and land use planning. This study aimed to evaluate the impact of LULC on the hydrologic characteristics of Palico watershed in Batangas, Philippines using the Soil and Water Assessment Tool (SWAT) model. Model inputs used were the 1989 and 2013 LULC maps and climatological and hydrologic data. Good agreement was obtained between simulated and observed streamflow values during model calibration ($NSE=0.84$ & $R^2=0.86$), and validation ($NSE=0.61$ & $R^2=0.68$). For the entire watershed, reduction in forest cover and rangeland resulted to an increase in surface runoff and decreases in baseflow or dry season flow and groundwater recharge. LULC changes affected the water quantity and timing of occurrence. Subbasin with 22% increase in forest cover and rangeland increased the baseflow by 1% to 15% and reduced the streamflow by 1% to 17% during the rainy months. Another subbasin with 54% forest loss resulted to more pronounced rainfall-runoff response with 11% to 17% decrease in baseflow and 4% to 24% increase in streamflow during rainy months. Finding the balance between these two opposite LULC change scenarios is crucial for the attainment of water security and sustainability in the watershed and in the areas it serves.

Keywords: Watershed modeling, Ungauged watershed, Rainfall-runoff response, SWAT model, Landuse/Landcover (LULC) change, Verde Island Passage (VIP), Engineering

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2016,

Improving the softening and melting properties of ferrous burden with high Al_2O_3 content for blast furnace by ore blending

Wu, Shengli, Lu, Yanan, Hong, Zhibin, Zhou, Heng

In order to solve the problem of poor gas permeability of blast furnace caused by high Al_2O_3 content in the burden, the softening and melting properties of sinter, pellets and lump ores are studied in this paper. The results show the differences between acid and basic iron ore materials. Based on this, this article study the influence of different kinds of pellets and lump ores blending with sinter on the softening and melting properties of comprehensive burdens. The results show that the self-fluxing pellet and porous lump ore with high aluminium content caused the Al_2O_3 content of comprehensive burden to raise 0.26% compared to acid pellet and dense lump ore with low aluminium content. However, the highest pressure drop of comprehensive burden is reduced from 2.50 kPa to 1.70 kPa, the S-value is decreased from 198 kPa °C to 114 kPa °C. Therefore, this method of ore blending will improve the softening and melting properties of integrated burden.

Keywords: *Blast furnace, Permeability, Softening and melting property, High aluminium content, Primary slag, Engineering*

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2020,
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Increasing the softening as well as melting behaviors for iron ore materials within the blast furnace cohesive zone through the high-temperature interactivity

Lu, Yanan, Wu, Shengli, Du, Binbin, Zhou, Heng

As for ferrous burden, the softening and melting (SM) behaviors greatly affect the cohesive zone thickness, position and shape. Ironmaking researchers have found that it's not appropriate to evaluate the blast furnace burdens only based on the SM behavior of single iron-bearing materials because the sinter will interact with acid materials at high temperatures. In present study, a new visual method has been given to research the SM behavior of five single iron ores and four types of mixed burdens. The results show that the SM properties of all iron ores in the cohesive zone (CZ) are enhanced through interactions at high temperature. Due to intense interaction at high temperature, SM behavior of the mixture burden A (containing lump ore L-A and sinter) is better than the mixture burden B (containing lump L-B and sinter), despite the lump ore L-A SM behavior is remarkably reduced compared with the lump ore L-B. Additionally, experimental results for melting and dropping of integrated burdens also prove that high temperature interaction is important for enhancing the performance of SM in ferrous materials and improving the permeability of the blast furnace.

Keywords: *Softening and melting behavior, Visual high temperature methodology, High temperature interactivity, Cohesive zone, Blast furnace burden, Engineering*

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2020,
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Influence of atmosphere and basicity on softening and melting behaviors of the CaO–FeO–SiO₂–Al₂O₃–MgO system

Ueda, Shigeru, Miki, Takahiro, Kim, Sun-Joong, Gao, Xu, Nogami, Hiroshi, Kitamura, Shin-ya

In this study, we analyze the softening and melting behaviors of the CaO–FeO–SiO₂–Al₂O₃–MgO system for improving gas permeability in a blast furnace. The temperature of the oxide is increased to 1 723 or 1 773 K in a CO/CO₂ mixture; the softening and melting temperatures and the temperature of penetration into the coke bed are measured. Because the CO/CO₂ ratio in the atmosphere influences the stable state of iron or iron oxide, the softening and melting behaviors are investigated for numerous CO/CO₂ ratios. We observe that the reduction of the sample progresses in an atmosphere with a high CO/CO₂ ratio, and thus, the softening temperature increases. Because the composition of the oxidation phase influences the solidus and liquidus temperatures, the influence of basicity on the phenomena is also investigated, and a method of reducing the difference between the softening and dripping temperatures is discussed.

Keywords: Blast furnace, Coke bed, Iron ore, Softening, Melting, Gas permeability, Engineering

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Influence of CaO/SiO₂ on the reduction behavior of sintered Fe₂O₃–CaO–SiO₂–Al₂O₃ tablets at the softening and melting temperatures

Kato, Kengo, Konishi, Hirokazu, Ono, Hideki, Fujimoto, Shinji, Koizumi, Yuichiro

Reduction experiments were conducted with sintered Fe₂O₃–CaO–SiO₂–Al₂O₃ tablets at (mass%CaO)/(mass%SiO₂) (C/S) of 1.5, 2.0, and 2.5 at 1 000, 1 050, 1 100, 1 150, and 1 200°C. From the reduction behaviors, we investigated the relationship between the reduction rate and C/S at the softening and melting zone temperatures of blast furnaces. The reduction rates at C/S = 2.0 and 2.5 increased with temperature in the range of 1 000 to 1 200°C. The reduction rate at C/S = 1.5 increased with temperature in the range of 1 000 to 1 150°C; however, at 1 200°C, it decreased to the same value obtained at 1 000°C. The microstructures of these samples, after sintering at 1 270°C, pre-reduction at 900°C, and reduction at 1 200°C, were analyzed through SEM-EDS. Fe₂O₃ particles, SFCA, slag, and pores among Fe₂O₃ particles existed in the samples after sintering. The matrix components in the pre-reduced sample were suggested to be calcium silicate slag containing FeOx and Al₂O₃ at C/S = 1.5, and to be 'FeOx' originated from SFCA at C/S = 2.0 and 2.5. The porosity of the open pores at C/S = 1.5 decreased to 16%. It was found that the reduction rate at 1 200°C decreased due to this lower porosity. By contrast, the porosity of the open pores after reduction at C/S = 2.0 and 2.5 was much higher than that after pre-reduction. The reduction rates of these samples at 1 200°C were found to not decrease as a result of maintaining a higher porosity. **(Author's abstract)**

Keywords: Blast furnace, Cohesive zone, Reduction behavior, Melting behavior, Pore structure, Engineering

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Influence of gasification reaction of coke on sliding and dynamic contact angles of droplets in a blast furnace

Ogyu, Shinsuke, Zheng, Lichun, Gao, Xu, Ueda, Shigeru, Sukenaga, Sohei, Kitamura, Shin-ya

To enhance the descent of droplets in the coke bed of a blast furnace, the sliding angle of the water droplet and the advancing and receding contact angles at the time of sliding were measured. Coke used as a reducing agent in a blast furnace was employed as a substrate. Because the shape of the coke surface varies with the gasification reaction with CO₂, the coke substrate was treated with heat (1 273 K) in a CO/CO₂ atmosphere. Irregularities of approximately several micrometers were formed on the coke surface by the gasification reaction, and the sliding angle of the droplet decreased.

Keywords: *Coke, Dynamic contact angle, let motion, Dripping zone, Blast furnace, Surface roughness, Engineering*

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Influence of injection distance on water droplet behavior in high pressure descaling

Tamura, Yuta, Ueoka, Satoshi, Kimura, Yukio, Kabeya, Kazuhisa

Hydraulic descaling is used in hot rolling mills in order to remove scale and prevent surface defects. Because the impact pressure of the descaling jet is one important factor from the viewpoint of mechanical breaking and applying thermal shock to scale layers, the water jet structure and the droplet velocity should have large effects on scale breaking properties. However, the influence of the injection distance on the jet structure and the droplet velocity has not been clearly understood. In this work, the behavior of changes in the descaling jet structure and attenuation of the water droplet velocity along the injection distance were investigated experimentally. High pressure descaling nozzles with pressures up to 25 MPa were used, and the injection distance was varied in the range from 30 to 400 mm. The jet structure was observed with a high speed camera, and the water droplet velocity and diameter were measured with a phase Doppler analyzer. The results confirmed that the jet structure changes continuously through a process of continuous flow, break-up, water lumps, and water droplets. It was found that a continuous flow can be maintained for a long distance by using a low injection pressure and large flow rate, and the water droplet diameter also becomes larger, which reduces velocity attenuation. These deformation properties of the jet structure are related to the Weber number expressed by the relative velocity between a water droplet and the surrounding air. A smaller Weber number is effective for reducing velocity attenuation over a long injection distance.

Keywords: *Descaling, Oxide scale, Laser doppler, Hot rolling mill, Engineering*

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Influence of iron carbide on mechanical properties in high silicon-added medium-carbon martensitic steels

Teramoto, Shinya, Imura, Masahito, Masuda, Yuki, Ishida, Toshinori, Ohnuma, Masato, Neishi, Yutaka, Suzuki, Takahisa

Using a medium-carbon steel containing 2 mass% Si, we investigated the effect of its tempered martensite microstructure on its mechanical properties. We found that the tensile strength of tempered martensite continuously decreases with increasing tempering temperature and that its yield strength markedly decreases in a tempering temperature range of 673 K to 723 K. To investigate the correlation with the microstructure, we examined the effect of tempering temperature on the microstructure by SEM and TEM and identified Fe carbide phases by TEM nanobeam diffraction pattern analysis and X-ray diffractometry. In the tempering temperature range where the yield strength significantly decreases, the morphology of the ϵ carbide precipitated in martensite blocks changed from platelike to granular and the χ carbide was precipitated in a small amount in the samples tempered at 723 K. SAXS quantitative evaluation of the ϵ carbide revealed that the decrease in the size and volume fraction of the ϵ carbide with the increase in the tempering temperature was far greater than with the samples tempered at 673 K and below. The sharp decrease in the yield strength was suggested to be correlated with the increase in the mobility of dislocations with the decrease in the precipitate volume fraction resulting from the dissolution of ϵ carbide in the transformation process of the Fe carbides.

Keywords: *Medium-carbon steel, Tempered martensite, Carbide, Yield strength, Microscopy, Small angle scattering, X-ray diffractometry, Engineering*

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Integrated weighted overlay model using inverse distance weightage for assessing groundwater quality

Jeyanthi, J.

Groundwater management is a potential solution to the global water crisis. This study assessed the groundwater quality at Mettupalayam, Tamil Nadu, India in order to determine its suitability for drinking. Groundwater samples were collected and their physicochemical parameters such as pH, electrical conductivity (EC), total hardness (TH), total dissolved solids (TDS), Ca^{2+} , Mg^{2+} , SO_4^{2-} and Cl^- were determined and benchmarked with standard drinking water requirements. The variations of these parameters were presented spatially. The groundwater is generally brackish and hard; and of low alkalinity and high salinity. Consequently, the groundwater in most parts of the study area is unsuitable for drinking without treatment. It is recommended that point and nonpoint sources of groundwater pollution at Mettupalayam should be identified, monitored and managed in order to protect the groundwater resource.

Keywords: *Irrigation and drainage, Population standpoints and water quality index, Engineering*

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NP

Introduction of dendrite fragmentation in microstructure calculation by cellular automaton method

Morita, Shugo , Miki, Yuji , Toishi, Keigo

Control of the solidification microstructure in continuous casting of steel is necessary because the microstructure affects material properties. In order to predict the solidification microstructure, the effect of dendrite fragmentation was indirectly introduced in the cellular automaton method by using V_{crit} , which is the velocity threshold of the molten steel flow. Calculations were carried out with various V_{crit} ($200 \mu s^{-1}$ to $1 mms^{-1}$), and the results were compared with the results of a casting experiment using high carbon steel. The observed specimens were extracted from the upper part and lower part of casting. Equiaxed grains and branched columnar grains were observed in the microstructure of the upper specimen, whereas only columnar grains were observed in the microstructure of the lower specimen. The calculation results with V_{crit} greater than $400 \mu m$ showed good qualitative agreement with the microstructures of both observed specimens. The microstructures were calculated because the flow velocity of the molten steel around the upper specimen was much greater than that around the lower specimen. There is a possibility that solute transportation, which induces fragmentation, occurs even if the velocity of the molten steel flow is on the order of $10^{-4} ms^{-1}$.

Keywords: *Microstructure development, Numerical simulation, Fragmentation, Cellular automaton method, Center segregation, Engineering*

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Investigation of silicon die crack for varying silicon die parameters and die attach material

Dimagiba, Richard Raymond N. , Callanga, Jennifer F. , Macaspac, Hannah Erika D., Mena, Manolo

Demand for small sized, portable electronic devices continually increases until today. Compact electronics would mean a reduction in size of semiconductors that would translate to further shrinking of components inside of it such as the small outline diode (SOD) and the small outline transistor (SOT). This work utilized the finite element method with a fracture mechanics approach to analyze the effect of varying geometric parameters on the J-integral of an induced crack on the silicon die. Furthermore, investigation of the effect of two die attach materials, having different modulus of elasticity, on the crack propensity on the silicon die was done. The J-integral values obtained generally showed a peak value with the mid-sized silicon die whose die attach material has higher modulus of elasticity. The J-integral value generally decreased with die thickness but was found to be minimum at around 100 μm die thickness. A further reduction in thickness resulted in an increase in J-integral. Results from the simulations will aid in determining the effect of these parameters on the reliability of the package with respect to die crack risk and can be utilized to guide improvements on the existing package design.

Keywords: *Die crack, J-integral, Small-outline transistor, Engineering*

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Land use change effects on plant and soil properties in a mountainous region of Iran

Shirmohammadi, Ebrahim , Ebrahimi, Mahdieh , Rad, Mina Hashemi

This study was conducted to show the effects of rangeland conversion into agricultural land uses in terms of on plant and soil degradation in Choram rangeland, Iran. Three sites, including dry farming, horticultural and rangeland were selected. Across site, vegetation factors such as plant production, canopy cover and density were measured. Soil samples were extracted at depths of 0-30 and 30-60 cm. The highest plant productions (60 kg ha^{-1}), vegetation cover (30%) and density of class I (3 n m^{-2}) were recorded in the rangeland. The lowest plant productions (19 kg ha^{-1}), vegetation cover (0.41%) and density of class I, II and III ($2, 7, 6 \text{ n m}^{-2}$, respectively) were measured in the horticultural land use. Except saturation percentage, clay, silt and sand there were not significant differences among the soil properties of land uses. However, at depth of 30-60 cm the highest significant organic matter (14.33 kg ha^{-1}) and potassium (0.84%) were measured in the rangeland and dry farming land uses, respectively. Habitat conversion from the rangeland to arable lands could change the species properties and result in the reduction of vegetation cover and reduction of soil quality.

Keywords: *Soil fertility, Land use change, Dry land, Plant properties, Engineering*

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Magnetic, electrical, thermal and elastic properties of high-Mn electrical steel

Kim, Jaehoon, Song, Yuxin, Fukuda, Takashi

We have studied influence of Mn doping on electrical resistivity, magnetic properties, specific heat and elastic constants of electrical steels. The electrical resistivity of the steel with Mn content of 1.5 mass% (HM steel) is by 13% higher than that of the steel with Mn content of 0.3 mass% (LM steel) at 5 K, and the difference decreases as temperature increases. In addition, magnetocrystalline anisotropy constant K_1 of the HM steel is smaller than that of the LM steel by 15% or more in a wide temperature range. Despite of these benefits as electrical steel, the spontaneous magnetization of the HM steel is by 1.9% lower and specific heat is by 0.9% higher than that of the LM steel. Elastic constants of the two steels are almost the same. Moreover, Curie temperature of the HM steel is by 14 K lower than that of the LM steel.

Keywords: *Electrical steel, Magnetocrystalline anisotropy constant, Electrical resistivity, Spontaneous magnetization, Specific heat, Elastic constant, Curie temperature, Engineering*

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Melting behaviour of iron ore pellet bed under nut coke mixed charge conditions

Gavel, Dharm Jeet, Adema, Allert, Van der stel, Jan, Kwakernaak, Cees, Sietsma, Jilt, Boom, Rob, Yang, Yongxiang

The melting and dripping behaviour of an iron ore pellet bed mixed with nut coke are investigated through a series of quenching, melting and dripping experiments. In the melting bed of iron ore pellets, nut coke acts as a frame to maintain the passage for the gas flow. The iron carburisation level of the pellet shell is found to control the melting temperature of the pellet bed. Simultaneous and layer-wise melting is observed for the pellet bed with and without mixed nut coke, respectively. In the case of pellet bed mixed with nut coke, the liquid dripping starts at a lower temperature (1 500°C) compared to the case when nut coke is absent (1 518°C). Subsequently, a steady rate of liquid dripping is observed for the pellet bed mixed with nut coke. However, in the case of the pellet bed without nut coke, most of the liquid drips (~50 wt%) at high temperature (1 550°C). The difference in carbon content of the quenched pellets and the dripped metal reveals that a substantial iron carburisation occurs when liquid iron flows over the regular coke particles. The nut coke is noticed to consumed preferentially in place of the regular coke. Additionally, the total coke consumption decreases with an increase in nut coke addition in the pellet bed. These results give support for more extensive use of nut coke as a replacement of the regular coke in the ironmaking blast furnace.

Keywords: *Ironmaking, Blast furnace, Nut coke, Pressure, Iron carburisation, Melting, Dripping, Engineering*

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Microstructure development with thermomechanical processing in alloy MA956

Hosoda, Takashi, Clarke, Kester D., Maloy, Stuart A., Speer, John G., Findley, Kip O.

Microstructural and texture development with thermomechanical processing was performed through a combination of cold-rolling and annealing, in MA956 plate consisting of a layered and inhomogeneous microstructure. The alloy contained in mass percent, 20 Cr, 0.02C, 4.8 Al, 0.4 Ti, 0.4 Y₂O₃, and the balance iron. The starting material was as-hot-rolled plate, 9.7 mm thick. The as-hot-rolled plate was subjected to 40%, 60%, and 80% cold-rolling reduction and subsequently annealed at 1 000°C, 1 200°C, and 1 380°C. Assessment of microstructural and texture developments before and after cold-rolling and annealing was performed using light optical microscopy (LOM), Vickers hardness testing, and electron backscatter diffraction (EBSD). Locally introduced misorientations by cold-rolling in each region were evaluated by Kernel Average Misorientation (KAM) maps. The as-hot-rolled condition contained a layered and inhomogeneous microstructure consisting of thin and coarse elongated grains, and aggregated regions which consisted of fine grains and sub-grains with {100} <011> texture. The microstructure of the 40% cold-rolled condition contained deformation bands, and the 60% and 80% cold-rolled conditions also contained highly deformed regions with intersecting deformation bands. The magnitude of KAM angles varied through the thickness depending on the initial microstructures. Recrystallization occurred in regions where high KAM angles were dense after annealing, and nucleation sites were fine elongated grain regions, deformation bands, and highly deformed regions. The shape and size of the recrystallized grains varied depending on the nucleation sites.

Keywords: *ODS, INCOLOY MA 956, Mechanical alloying, Cold-rolling, Annealing, Microstructure, Recrystallization, EBSD, Engineering*

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Modeling and analysis of heat transfer in deforming packed bed

Nogami, Hiroshi

The cohesive zone of the blast furnace is one of the most important zones because it deeply relates to the furnace stability and efficiency. It is considered that the thickness of the cohesive zone increases with decreasing the reducing agent rate and increasing the usage of the low grade raw materials in future. The thickness of the cohesive zone should be decreased or permeability of the cohesive zone should be improved to keep the furnace stability and production efficiency. Heat transfer in the cohesive zone is a quite important issue to control the cohesive zone because it determines the temperature rise of this zone namely softening and melting rate of the burden materials. In this study, a mathematical simulation model for the fluid flow and heat transfer in the packed bed of the deforming particles was developed. This model combined the discrete element method for bed deformation and the computational fluid dynamics for the gas flow. Additionally, the inter-particle heat exchange in the deforming packed bed was newly formulated and linked with the discrete element analysis. This mathematical model successfully revealed the variation of the heat transfer mechanism with the deformation of the packed bed. The simulation results could give the useful information for designing the burden distribution under the low carbon and high low-grade material operation of the blast furnace.

Keywords: *Cohesive zone, Deforming packed bed, Fluid flow, Thermal flow, Numerical simulation, Engineering*

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Modeling of surface crack defects developed on shear edge in high-strength automotive steel sheets

Goto, Sota, Yamazaki, Kazuhiko, Doan, Thi-huyen, Funakawa, Yoshimasa, Umezawa, Osamu

Surface crack defects developed on the shear edge cause a problem in shearing of high-strength steels. The surface crack formation mechanism was clarified by microstructural examinations and numerical simulation. Two types of 780 MPa grade hot-rolled steel sheets with a thickness of 2.6 mm were chosen for the evaluations because the materials show different surface crack susceptibilities. Cleavage fracture was responsible for the surface cracks, and micro-ductile cracks with a length of 30 μm to 40 μm were detected in the interrupted punching samples. A numerical simulation demonstrated that a tensile stress was developed in the direction of the micro-ductile cracks opening during punching process. The critical length of the micro-ductile crack for cleavage fracture as a crack initiation site was given by linear fracture mechanics; for example, the critical length is 23 μm or longer under the applied tensile stress of 910 MPa. The tensile stress causing cleavage fracture decreased by reducing the tool clearances, and it was shown experimentally that surface crack defects can be prevented by controlling the clearance appropriately.

Keywords: *780 MPa grade hot-rolled steel, Hole punching, Cleavage fracture, Micro-ductile crack, GTN model, Engineering*

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Morphology and composition of inclusions in Si–Mn deoxidized steel at the solid-liquid equilibrium temperature

Gamutan, Jonah, Miki, Takahiro, Nagasaka, Tetsuya

Morphology and composition of inclusions change with temperature. However, besides the temperature conditions during steelmaking or continuous casting, other factors contributing to changes in the morphology and composition of inclusions during solidification are still unknown. In this study, the formation of complex inclusions in Si–Mn deoxidized steel after isothermal holding at the solid-liquid equilibrium temperature (TS) was investigated. The typical inclusions found in the alloy were MnO–SiO₂ based, spherically shaped and homogeneously distributed. With isothermal holding at the solid-liquid equilibrium temperature, formation of a secondary SiO₂-rich inclusion phase occurred. The changes in the composition of the inclusions depended on the manganese and silicon contents in the metal. The general mechanism of inclusion formation observed in this study can be divided into three steps: 1) the formation of primary MnO–SiO₂ inclusions above the liquidus temperature when the steel is in a completely molten state as a result of the deoxidation process; 2) the nucleation of secondary inclusions as the molten steel becomes supersaturated with the solute elements while holding at the solid-liquid equilibrium temperature; and 3) the growth and coalescence of inclusions due to natural convection in the molten alloy. From this, the inclusions formed in Si–Mn deoxidized alloys held isothermally at the solid liquid equilibrium temperature were of three types: primary MnO–SiO₂ inclusions, secondary SiO₂ inclusions and complex inclusions with both primary MnO–SiO₂ inclusions and precipitated secondary SiO₂ inclusions.

Keywords: *Si-Mn deoxidation, Complex inclusion formation, Solid-liquid equilibrium temperature, Microsegregation, Engineering*

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Multiphase flow behavior in a single-strand continuous casting tundish during ladle change

Ling, Haitao, Xu, Rui, Wang, Haijun, Chang, Lizhong, Qiu, Shengtao

The three-phase flow behavior in a single-strand continuous casting tundish during ladle change was investigated using physical modeling. These phenomena observed from physical modeling were explained by employing the multiphase model volume of fluid, which can track the interface behavior between the liquid steel, slag, and air during this operation. The effects of the refilling time and lowest operating level on the slag entrainment and the steel exposure during ladle change were analyzed and discussed, respectively. Increasing the refilling time significantly decreased the amount of entrained oil and the exposed area in the impact zone during ladle change. However, the increase in the lowest level had little influence on reducing the slag entrainment. To reduce the slag entrainment and the steel exposure during ladle change, the refilling time in the prototype should be larger than 3 minutes. Furthermore, the use of the turbulence inhibitor has also been evaluated. By diminishing the turbulence intensity in the impact zone and the velocity magnitude at the steel-slag interface, the turbulence inhibitor reduced considerably the amount of entrained slag and the steel reoxidation. The results indicated that the emulsification phenomenon during ladle change could be eliminated using TI-2, and the maximum exposed area fractions in the impact zone for different refilling times and lowest levels were less than 13% and 23%, respectively. Therefore, the TI-2 was recommended to improve the steel cleanliness during ladle change.

Keywords: *Tundish, Ladle change, Slag entrainment, Slag exposure, Physical modeling, Numerical simulation, Engineering*

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Nanostructured bainitic bearing steel

Yang, Zhinan , Zhang, Fucheng

Bearing is the most important component for nearly all mechanical equipment. Nanostructured bainitic steel, which is a new bearing steel, not only possesses necessary hardness and higher toughness, but exhibits excellent wear resistance and rolling contact fatigue performance, making it suitable for bearing application. In recent years, the research on nanostructured bainitic bearing steel has gained great progress and obtained attentions from bearing industry. To make a clear knowledge on nanostructured bainitic bearing steel, and reveal the further research direction on this field, this paper reviews the development of nanostructured bainitic bearing steel, including the design of chemical composition, the heat treatment process, the feature of microstructure, the properties involving conventional mechanical properties, wear resistance and rolling contact fatigue performance, the effect of retained austenite, and the distribution of residual stress.

Keywords: *Bearing steel, Nanostructured bainite, Heat treatment, Microstructure, Property, Application, Engineering*

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Non-equilibrium precipitation behavior of TiC during rapid solidification of TiC-reinforced wear-resistant steel

Du, Gang, Liu, Feng

Precipitation behavior of TiC in TiC-reinforced wear-resistant steel was investigated using both thermodynamics and experiments. The carbide in TiC-reinforced wear-resistant steel is principally Ti-rich MC-type, which starts to precipitate at 1460°C in the solid-liquid zone. As the temperature decreased, there is no major change in the concentration of Ti and C in TiC. The results calculated by using equilibrium assumptions show that TiC can form when the solid fraction exceeds 0.24. However, the isolated primary TiC was observed in the sample cooled at rate of 162 K/s and 267 K/s, indicating that TiC can precipitate from the melts at the initial stage of solidification process. As an extension of Brody and Fleming's model, the interface response functions relating the cooling rate with the interface composition and interface temperature, which consider interface non-equilibrium effect on the basis of incomplete mixing of solute in the liquid during solidification, were used to evaluate TiC precipitation behavior during rapid solidification for different cooling rates. In comparison with lower cooling rate, the effect of non-equilibrium behavior is strengthened under the condition of higher cooling rate, so that primary TiC can precipitate from the melts at the initial stage of solidification when a high cooling rate is imposed.

Keywords: *Rapid solidification, TiC, Non-equilibrium, TiC-reinforced wear-resistant steel, Cooling rate, Engineering*

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Numerical simulation of coexisting solid-liquid slag trickle flow in a coke bed by the SPH method with a non-Newtonian fluid model

Natsui, Shungo, Sawada, Akinori, Nogami, Hiroshi, Kikuchi, Tatsuya, Suzuki, Ryosuke

A simulation of the dripping behavior of solid-phase suspended molten slag in a coke bed was performed using the Bingham fluid model in the framework of smoothed particle hydrodynamics (SPH). SPH can track the motion of droplets which are suspended in dispersed solids. A case study was performed in which the yield coefficient varied with the viscosity coefficient of the molten $\text{SiO}_2\text{--CaO--Al}_2\text{O}_3$ slag, with suspended solids approximated by the Bingham fluid model, and the holdup droplets were trapped at approximately the same site regardless of the yield value. When the yield value exceeded the threshold, the volume of each holdup droplet increased. This threshold is correlated with the decrease in the shear rate at the bottleneck. Increasing the solid phase ratio in the molten slag is also predicted to increase the yield value with viscosity; thus, the amount of holdup droplets increases at the specific holdup sites as a dispersed phase. This indicates that the increase in the yield value approaches the powder holdup mechanism that is closed one after another starting from a specific holdup site.

Keywords: *Ironmaking blast furnace, Coke bed, Trickle flow, Molten slag, Static holdup, Bingham plastic fluid, Engineering*

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Numerical simulation on phenomena of fine particles passing through an orifice under gas flow condition

Stephan, Siahaan Andrey, Oishi Yoshihiko, Kawai, Hideki, Nogami, Hiroshi

Under low reducing agent rate and high pulverized-coal injection rate operations, coke powder and unburnt char are generated in the blast furnace. These powders flow through the packed bed inside the furnace entrained by the gas flow. The powders accumulation in packed bed will deteriorate gas and liquid permeability and creates an unstable situation inside the blast furnace. Thus, it is important to quantitatively evaluate the accumulation rate on a distribution channel of coke powders. In this study, the behavior of the powder particles passing through the orifice formed by three coarse particles that osculate one another and compound in an equilateral triangle was numerically analyzed using the DEM-CFD. The results revealed the effect of drag force on the powder motion passing through the orifice. Moreover, the effect of the position of the powder passing through the orifice to pressure drop fluctuation inside the triangular prism is also analyzed.

Keywords: *Powder motion, Simulation, Packed bed, Orifice, Drag force, Pressure drop, Engineering*

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Observation of chemical state for interstitial solid solution of carbon in low-carbon steel by soft X-ray absorption spectroscopy

Ninomiya, Kakeru, Kamitani, Kazutaka, Tamenori, Yusuke, Tsuruta, Kazuki, Okajima, Toshihiro, Yoshimura, Daisuke, Sawada, Hideaki, Kinoshita, Keisuke, Nishibori, Maiko

The near-edge X-ray absorption fine structure at the carbon *K* edge was measured for determining the chemical state of interstitial carbon in a low-carbon steel. In addition, the wavelength dependence of the photoelectron spectrum of the surface of the steel was evaluated, and a contamination and oxidation layer of 3 nm thickness was found. As a result, it was possible to observe a change in the chemical state of carbon existing in bulk iron located deeper than the oxidation and contamination layers, by evaluating the difference spectra between the sample and a reference. Furthermore, by evaluating the shape change of the difference spectra based on the heat treatment time, it was found that the chemical state of carbon in bulk iron changes with heat treatment.

Keywords: *Low-carbon steel, Aging, Chemical state analysis, X-ray absorption spectroscopy, Photoelectron spectroscopy, Engineering*

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Optimization of discharge parameters for a glow discharge emission spectrograph with two-dimensional spatial resolution

Zhang, Xinyue, Wagtsuna, Kazuaki

This paper describes a specified measuring system for glow discharge emission spectrograph, which can provide a spatial/radial distribution of analyte atoms on the sample surface, while the conventional system provides only the information on the elemental distribution in depth direction. For this purpose, a spectrometer system consisting of an image spectrograph and an intensified charge coupled device (ICCD) detector was employed. The delay time and gate width of the ICCD detector was principally selected to improve the spatial resolution of the emitting zone. The objective of this paper was to determine an optimized set of the experimental parameter for better spatial resolution. The best spatial resolution was obtained when the gate width was 1 s and the delay time was 60 s. Better spatial resolution was obtained at narrower gate width, because the re-emission from the analyte atoms could be observed to a less extent when the observation was conducted more instantly just after start of the pulsed discharge.

Keywords: *Atomic emission spectrometry, Glow discharge plasma, Three-dimensional imaging, Copper tip, Engineering*

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Optimization of thermal soft reduction on continuous-casting billet *Han, Yanshen , Yan, Wei , Zhang, Jiangshan , Chen, Weiqing , Chen, Jun , Liu, Qing*

Thermal soft reduction (TSR) is an effective technique to improve the inner quality of continuous-casting billet, but it may lead to undesired internal and surface cracks. In this work, the technologic parameters of TSR were optimized to ensure its effect and control the cracks of 82A tire cord steel billet. A heat transfer model with comprehensive thermo-physical parameters was established to simulate the thermal behavior of continuous-casting billet. The model was verified by comparing the measured surface temperatures and the calculated ones. According to the mechanism of TSR on billet, both the location and water flow rate were comparatively optimized. TSR was determined to locate at 6.96 m–8.46 m from meniscus, where the temperature of billet center dropped rapidly to liquid impenetrable temperature. The water flow rate of TSR was set to 2.2 m³/h, which allowed the reheating rate and surface temperature in a reasonable range and prevented the formation of the cracks. Plant trials were conducted to verify the effect of the optimized TSR. The results showed that the central porosity, V segregation and central segregation of the billet were obviously improved by applying TSR. Meanwhile, the internal and surface cracks were well controlled in the billet.

Keywords: *Thermal soft reduction, Technologic parameters, Crack, Inner quality, Central segregation, Engineering*

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Permeation and blockage of fine particles transported by updraft through a packed bed (numerical approach)

Satou, Shin, Stephan, Andrey, Oishi, Yoshihiko, Kawai, Hideki, Nogami, Hiroshi

As a method for reducing CO₂ in blast furnaces, low-reducing agent ratio and large amount of pulverized coal is being carried out to reduce the amount of coke used and reduce the carbon input to the blast furnace and its operation cost. However, these operating methods increase the deposit amount of coke powder and unburned char generated in the blast furnace and decrease process efficiency. A threedimensional numerical model is built and observed by the coupling system of DEM-CFD, performed to understand the principal factors that affected fine and gas permeability. Simulation is carried out in, where fine particles are injected simultaneously from the bottom of cylindrical packed bed, mimicking the experimental approach. The fine to packed diameter ration is given by $0.133 \leq D_p/d_p \leq 0.162$. At a larger diameter ratio, fine particles tend to concentrate at the bottom of the packed bed. In the case of lower particle diameter ratio, updraft gas will easy to permeate along with fine particles because of the existing of large open flow channels relative to fine diameter. Furthermore, no significant change in fine fraction transported to the upper area due to the change of gas velocities. In this present study, the effect of continuous fine particles injection and its effect on gas flow can be observed, where the gas flow avoiding the heavily concentrated area.

Keywords: *Blast furnace, Packed bed, DEM-CFD, Continuous fine injection, Blockage, Engineering*

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Phosphorus migration behavior of medium-phosphorus magnetite ore during carbothermic reduction

Zhang, Jing, Luo, Guoping, Chen, Yanbiao, Xin, Wenbin, Zhu, Jianguo

Time-dependent phosphorus migration characteristics during the carbothermic reduction process have been investigated based on the iron and phosphorus status in medium-phosphorus magnetite ore. The results show that the iron metallization enhanced from 84.38% to 96.49% with the reduction time varying from 10 min to 60 min. However, gasificating dephosphorization first increased from 21.03% to 33.07% and then decreased to 31.61% as a result of the large absorption of reduced phosphorus gas into metallic iron. Optimal phosphorous gasification was achieved at a reduction time of 50 min. Moreover, SEM-EDS and EPMA analyses indicated that the ratio of phosphorus content distributed between the iron phase and gangue minerals evidently increased from 0.12 to 1.01 and 1.18, as the reduction continued from 10 min to 30 min and 50 min. Meanwhile, the phosphorus content in the iron phase increased along with an increase in the carbon and Fe_3C contents. Furthermore, the aggravated phosphorus migration into the iron phase is inherently attributed to the smaller lattice discrepancy between Fe_xP and Fe_3C in contrast with that between Fe_xP and X-Fe, which accelerated the entrance of phosphorus into the lattice of Fe_3C and the formation of Fe_xP .

Keywords: *Phosphorus migration, Carbothermic reduction, Mineral evolution, Crystal structure, Engineering*

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Pitting corrosion of Steinmann stainless steel pins in simulated body fluid using cyclic polarization technique

Santos, Stephanie L., Mena, Manolo

Locally available Steinmann stainless steel pins were subjected to cyclic voltammetry in Kokubo simulated body fluid after immersion in SBF from 0 to 7 days. Results showed that the pins were susceptible to pitting corrosion from Day 0, with the degree of pitting increasing with the length of immersion. This may be due to the degradation of the initial passivation on the steel by SBF solution. SEM EDX analysis showed the presence of chloride precipitates in the pitting area. Chloride is known to induce autocatalytic corrosion of stainless steels. Optical Emission Spectroscopic analysis of the samples showed that one sample is SS304 and the other two were SS316L. The SS304 pins showed a higher tendency towards pitting corrosion when compared with the SS316L pins.

Keywords: *Steinmann pins, Pitting corrosion, Cyclic polarization, Engineering*

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Potentiostatic electrodeposition as an option to the traditional recovery of silver in artisanal gold smelting wastewater in Bulacan, Philippines

Sunga-Amparo, Jennifer Marie , Detras, Monet Concepcion M. , Migo, Veronica P. , Alfafara, Catalino G. , Velandres, Jomuel A. , Laurio, Michael Vincent O., Mendoza, Marlo

Potentiostatic electrodeposition for silver recovery in the artisanal gold smelting of Bulacan, Philippines was investigated as an alternative cost-effective method to prevent the generation of copper nitrate-rich effluent. The electrodeposition of dominant metal ions (silver, copper, iron, and lead) were observed from time-course profiles of metal ion removal efficiencies and measured currents at varying constant operating voltages. Initial silver ion removal rates increased with operating voltage supplied, however, redissolution also occurred during high-potential operation (1.5V to 2.0V). The occurrence of co-deposition and redissolution was managed by determining critical electrodeposition conditions. A critical operating voltage of 1.33 V favored high silver purity from recovered deposits at 89.5%, while critical electrodeposition time minimized the occurrence of metal redissolution under high-potential conditions. At an optimum voltage of 1.66 V, the observed silver ion removal was 77.8% and the silver purity from recovered deposits was 86.5%. Finally, the charge dose scale-up parameter was 0.528 C/mg silver ion removed and the corresponding energy requirement was 0.24 kWh/kg silver ion removed. Considering the increased silver purity from recovered deposits, and the lower charge dose and energy requirement, this study presents some advantages of potentiostatic electrodeposition in artisanal gold smelting.

Keywords: *Electrodisposition, Gold smelting, Silver nitrate, Scale-up, Charge dose, Engineering*

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Precipitation process of TiC in low alloy martensitic steel and its effect on wear resistance

Liu, Luo Jin, Liang, Xiaokai, Liu, Jun, Sun, Xinjun

Traditional low-alloy martensitic steel is widely used as wear-resistant steel parts. But the contradiction between hardness and processing as well as welding performance is prominent, which limits the development of wear resistance. Titanium carbide is often used in industrial production as a metal-based wear resistant phase, which is an inexpensive reinforcement that contributes to excellent overall performance. In this paper, a series of low-alloy martensitic steel sheets with same hardness grade and different Ti content of 0 wt%, 0.2 wt%, 0.3 wt%, 0.4 wt%, 0.5 wt% and 0.7 wt% are designed, respectively. The morphology and distribution of TiC precipitates in steel were characterized by OM, SEM, TEM and EPMA. The wear resistance was studied by wet sand semi-free abrasive wear test, and three modes of interaction between TiC particles and abrasives during wear process were summarized. The thermodynamic calculation was used to help explain the solidification precipitation process of titanium carbide particles.

Keywords: *Titanium carbide particle, Solidification process, Abrasive wear, Furrow, Low alloy wear resistant steel, Engineering*

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Prediction of softening behavior of simulant sinter ore by ADEM-SPH model

Isihihara, Shingo, Ohno, Ko-ichiro, Konishi, Hirokazu, Watanabe, Takashi, Natsui, Shungo, Nogami, Hiroshi, Kano, Junya

Softening and melting phenomena of burdens in the cohesive zone in the blast furnace are factors that cause the deterioration of gas permeability. Numerical examinations to predict the softening behavior of burdens in the packed bed were performed in this study. In order to represent the softening characteristics of the simulant sinter ore, the simulation of a single pellet load softening test was carried out. The strength properties of the pellets were evaluated by the shrinkage degree in the load softening test. Shrinkage degree of pellets with different basicity and pre-reduction ratio were attempted to reproduce. To represent the softening behavior of the pellet, ADEM (Advanced Distinct Element Method) SPH (Smoothed Particle Hydrodynamics) coupling model was applied. Softening and shrinkage could be represented by decreasing the joint spring coefficient while the pellet was loaded. The relationship between the joint spring coefficient and the temperature was determined to compare the shrinkage degree obtained in the experiment and the simulation. The determined joint spring coefficient was used to predict the softening behavior in the load softening test of a packed bed. The simulation results of the shrinkage degree curve showed good agreement with the experimental results. It was indicated that the softening behavior in the cohesive zone could be predicted by this calculation method.

Keywords: *ADEM, SPH, Simulation, Softening, Sinter ore, Engineering*

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Proposed localized wind-driven rain test parameters for building envelopes in Metro Manila

Sadie, Homer, Diola, Nathaniel

Rainwater intrusions in building envelopes have been recognized as the primary source of material deterioration inside buildings. These occurrences are partially attributed to wind-driven rain (WDR) scenarios. Local testing procedures and parameters to assess systems of building envelopes against WDR and its contributing leakage have not yet been established. After adapting international methodologies, a set of testing parameters are calculated. Parameters are pairings of spray rates and static pressures associated with return period for Metro Manila. The flow rates range from 5.89-16.05 L/min m², while the static pressure pairings range from 90 to 481 Pa for considered return periods of 2, 5, 10, 20 and 30 years. These calculated values are generally higher than the endorsed minimum from several ASTM standards and comparable to other testing parameters used in other countries. Therefore, the usage of preset WDR test parameters from the ASTM standards, might not reflect the expected climate event specific for Metro Manila.

Keywords: *Wind-driven rain, Water leakage, Static pressure, Test parameters, Metro Manila, Engineering*

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Recycling nickel slag by aluminum dross: iron-extraction and secondary slag stabilization

Zhang, Guangzong, Wang, Nan, Chen, Min, Cheng, Yanqing

Nickel slag is a metallurgical solid waste from nickel refineries, which can be recycled as one of excellent secondary sources due to valuable iron contents. In this work, the approach of recycling nickel slag by aluminum dross was proposed, and the processes of network modification of slags and reduction were successively investigated at 1 773 K. Upon the thermodynamic calculations, CaO was chosen as the modifier in order to obtain a higher activity of 'FeO', and basicity of the modified slag was determined as 1.0. Element mapping analysis of the modified slag showed that 'FeO' had been separated from the structure of nickel slag. After aluminothermic reduction for 120 min, the recovery degree of iron and copper was 94.35% and 97.89%, respectively. In addition, the secondary slag stabilization was discussed, and the utilization of the produced Fe–Cu alloy and the secondary slag was analyzed.

Keywords: *Recycling, Nickel slag, Aluminum dross, Iron-exaction, Secondary slag stabilization, Engineering*

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Research and application of model and control strategies for hot rolled strip cooling process based on ultra-fast cooling system

Chen, Dong, Li, Zhen-lei, Li, Yun-jie, Yuan, Guo

Ultra-fast cooling technology as an effective method for control microstructure and property, is widely used in hot rolled strips. For precise control of strip temperature in cooling process, a mathematical model based on UFC is established to calculate UFC-T and CT in high pressure mode, or only CT in low pressure mode. Temperature calculation compensation strategy is obtained to solve the situation that re-reddening after UFC process affects CT calculation. Furthermore, for existing self-learning strategy care less about evolution of strip temperature and has no ability to eliminate errors quickly, a multi-dimensional self-learning control strategy is proposed including dynamic self-learning gain, distributed temperature self-learning strategy and velocity coefficient for heat transfer self-learning. With help of proposed control strategies, strip temperature in cooling process is precise calculated and controlled. The model and strategies have been applied successfully in a 2050 HSM for development of low cost and feature strip products.

Keywords: *Hot rolled strip, Ultra-fast cooling, Temperature compensation, Multi-dimensional self-learning strategy, Engineering*

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Screening and identification of plants at a petroleum contaminated site in Malaysia for phytoremediation

Husin, Ahmad Khairi , Abasa, Abdul Rahman , Latif, Mohd Talib , Titah, Harmin Sulistiyaning , Abdullah, Siti Rozaimah Sheikh , Hanima, Raja Farzarul , Idris, Mushrifah, Ayub, Rozita

There is lack of sufficient data that describe which plants can be used in phytoremediation for petroleum and heavy metal contaminated sites, especially in the tropical climate region. The aim of the study was to identify native plants growing on a petroleum contaminated site in Malacca, Malaysia, which have a phytoremediation potential on petroleum. The second aim was to identify native plants at the same contaminated site for phytoremediation of heavy metal contaminants or hyper accumulation plants. In the initial screening of contaminated sites, some of the native plants were found to have the capability to grow in very high concentration of total petroleum hydrocarbon (TPH). This indicates that some of these plants have high potential to act as a phytoremediator. *Paspalum vaginatum* Sw, *Paspalum scrobiculatum* L. varbispicatum Hack, *Eragrostis atrovirens* (Desf.) Trin. exSteud, *Cayratia trifolia* (L.) Domin, *Chloris barbata* (L.) Sw, *Pycneus polystachyos* (Rottb.) Beauv and *Ischaemum timorense* Kunth were found to be potential phytoremediatory of TPH in contaminated soil. These plants were chosen based on thier high rate of survival in contaminated sites and in terms of uptake or in degrading contaminants. The Biological Accumulation Coefficient (BAC) has been used as a guideline to choose potential plants for heavy metal phytoremediation. In the study, the plants were screened based on BAC values for arsenic (As) and lead (Pb). The selected plants, *Melochia corchorifolia* L., *Ludwigia octovalvis* (Jacq.) P. H. Raven, *P. vaginatum*, *Cyperus sphacelatus* Rottb., are potential as phytoremediators while *L. octovalvis* and *Melastoma malabathricum* L. are potential *Pb* phytoremediators.

Keywords: *Selected plants, Phytoremediation, Contaminated site, TPH, Heavy metals, Engineering*

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NP

Simulation of powder motion with particle contact model including intervening liquid

Suzuki, Akira, Maruoka, Nobuhiro, Oishi Yoshihiko, Kawai, Hideki, Nogami, Hiroshi

The control of packed bed permeability in blast furnace is an important issue to realize highly efficient and stable operation of blast furnace under low carbon condition. The powder accumulation in the packed bed deteriorates the permeability, thus it is necessary to understand the powder behavior in the packed bed. Recently it was revealed that the existence of liquid in the bed had drastic effect on the motion and the accumulation of powder in the bed. In this study a mathematical model to describe the behavior of powder particle under liquid existing condition was developed using discrete element method. The model took into account cohesive force, normal viscous force, sheer viscous force and lubrication due to the liquid film. The model was validated by the comparison of the particle trajectories under various liquid properties. The model was applied to the simulation of passing behavior of the powder particles through the opening among three coarse spherical particles, and successfully reproduced the accumulation behavior under wetting condition.

Keywords: *Powder motion, Accumulation, Liquid, Simulation, Engineering*

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Smart adaptor: a wireless power switch of home appliances for risk reduction

Contreras, Harvvey Leonard M.

As the technology invades our homes, the chance of electrical fires happening increased over recent years. The study, Smart Adaptor is the solution suited in preventing those fires with simple home automation using smart adaptor system which transforms traditional appliances at home into a smart one. It was focused on creating a device to be added to the home appliances that is efficient, reliable and accurate and helped on lessening fire breakouts due to electronic malfunction. The device was tested in two households in Brgy. 150 Tondo, Manila wherein the device was used in two weeks span. The three main components were examined wherein the PIR sensors ability to detect human presence, the smart adaptors capability of turning off appliances and the Main servers monitoring skill were tested. The efficiency was based on the power consumption in two households wherein a decrease of 20-28% in the total power consumption with Smart Adaptor was measured. The average response time of 0.95 seconds proved the reliability of the PIR sensor to detect human presence within the range of 105o within 5.4 meters distance and 2.74 meters width. The connectivity of the PIR and main server had an accuracy of 90% while that of the smart adaptor to the main server was 85%. Hence, the three main components in a system were acceptable to the respondents with 4.35 overall rating. Thus, the system was capable of monitoring home appliances and reduces fire breakouts at the same time.

Keywords: *PIR sensor, smart adaptor, main server, alarm system, Engineering*

Antorcha, Volume No. 6 Issue No. 2,
2019,
(Filipiniana Analytics)

Softening–melting properties and slag evolution behavior of high titanium sinter

Zhou, Kai, Song, Jiaqi, You, Zhixiong, Xie, Hongen, Lv, Huewei

Vanadium–titanium magnetite (VTM) is an important strategic resource, and now the process of Blast Furnace (BF) is the dominate route for smelting VTM. However, the difficulties of smelting VTM by BF inhibited further increase of VTM proportion in furnace burden due to its complex behavior in cohesive zone. The objective of this study is to reveal the softening–melting behavior of a high titanium sinter. The results indicated that the softening–melting properties of the experimental high titanium sinter were relatively worse than that of ordinary sinter due to its wider melting temperature interval and bad gas permeability in melting stage. The melting temperature interval of 225°C was obtained, and the permeability index (S value) of 1 917 kPa·°C was calculated correspondingly. A second increase in pressure drop was observed in the softening–melting process, which may be ascribed to great difference of melting point between pig iron and slag. The mechanism on slag evolution was also clarified by interrupting the softening–melting process at characteristic temperatures. The XRD patterns indicated that initial slag phase mainly consisted of wustite, silicates and perovskite, of which the wustite content decreased gradually during the softening–melting process. The content of wustite was a crucial factor that affected the phase transformation during slag evolution.

Keywords: *Vanadium-titanium magnetite, Softening-melting behavior, Slag evolution, Phase transformation, Blast furnace, Engineering*

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A statistical analysis on the complex inclusions in rare earth element treated steel

Meng, Yang, Yan, Chunlian, Yang, Xiaopeng, Ju, Xinhua

In present work the complex inclusions were investigated in the rare earth element treated steels. Based on the results of automated inclusion analysis in the La and Ce added wheel steel a post-processing method was proposed to correct the errors in size distribution, amount and chemical composition introduced by the double-threshold scan. According to the automatic result, the peaks for light-element and heavy-element inclusion were both in range of 0.14–0.53 μm , with the value of 66.5/mm² and 25.9/mm² respectively, and the results were corrected in post-processing to be 27.0/mm² and 15.9/mm² respectively. Meanwhile, the peak of number density for complex inclusion was in range of 0.9–1.3 μm with the value of 10.3/mm². The amount of complex inclusions accounted for about one third of the total. La and Ce dominated in the complex inclusions due to their large size.

Keywords: *Automated inclusion analysis, Complex inclusion, Double-threshold scan, Post-processing, Engineering*

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Structural evaluation of molten aluminosilicate by combining impedance measurements and cell model calculations

Harada, Yusuke, Nishioka, Nobuo, Saito, Noritaka, Nakashima, Kunihiro

Molten oxides have been used for a range of processes; however, their physical and rheological properties affect the quality of products manufactured from them. Although various reports of structural analysis exist, the methods employed are typically time consuming. Herein, a method is established for rapidly estimating the structures of melts by combining impedance measurements and thermodynamic calculations regarding the cell model. The melt structure is calculated using two thermodynamic parameters; however, these parameters have not yet been reported for systems containing alkali metal oxides. Thus, impedance measurements were carried out for SiO₂–Al₂O₃–RO melt systems (R = Ca or Mg), and relationships between the equivalent circuit components and the thermodynamic parameters of the cell model were established. The structures of melts containing alkali metal oxides were then estimated by calculating the thermodynamic parameters of these systems by substituting the equivalent circuit components in the correlation equations. The structures estimated by the proposed method appear to correlate with those measured by NMR spectroscopy.

Keywords: *Impedance measurement, Thermodynamic model, Cell model, Structural evaluation, MAS-NMR, Aluminosilicate melt, Engineering*

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Structure and viscosity of CaO–Al₂O₃–B₂O₃ based mould fluxes with varying CaO/Al₂O₃ mass ratios

Li, Jiangling, Chou, Kuochih, Shu, Qifeng

The effect of CaO/Al₂O₃ ratio on the structure of CaO–Al₂O₃–B₂O₃ based glassy mould fluxes was investigated by employing ²⁷Al and ¹¹B Triple Quantum Magic-angle spinning nuclear magnetic resonance (3QMAS-NMR) and Raman spectroscopy. ²⁷Al and ¹¹B 3QMAS-NMR spectrums showed that Al³⁺ mainly forms [AlO₄] as a network former and B³⁺ mainly forms [BO₃] groups in CaO–Al₂O₃–B₂O₃ based glasses. Raman spectrum showed existences of different [AlO₄] structure units and BO₃ pyro-borate units. In addition, deconvolution results on Raman spectrums indicate that the degree of polymerization of aluminate network in CaO–Al₂O₃–B₂O₃ based glasses decreases with the increase of CaO/Al₂O₃ ratio. The effect of CaO/Al₂O₃ ratio on viscosity of CaO–Al₂O₃–B₂O₃ based glassy mould fluxes was investigated by employing the rotating-cylinder method. The viscosity decreases with increasing CaO/Al₂O₃ ratio in CaO–Al₂O₃–B₂O₃ based mould flux. Correlation between viscosity and structural information of investigated mould fluxes was explored.

Keywords: *Structure, Viscosity, 3QMAS-NMR, Raman spectroscopy, CaO–Al₂O₃–B₂O₃ based mould flux, Engineering*

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Technical, financial and environmental assessment of bio-oil production from pyrolysis of pigeon pea [*Cajanus cajan* (L.) Millsp.] wood

Amongo, Rossana Marie C., Suministrado, Delfin C., Genuino, Homer C., Elauria, Marilyn M., Elauria, Jessie C., Tanquilut, Mari Rowena C., Yaptenco, Kevin F.

Pigeon pea (*Cajanus cajan* (L.) Millsp. wood was pyrolyzed using a semi-continuous gram-scale reactor at optimized conditions of temperature (469°C), nitrogen flow rate (14.2 mL min⁻¹), and particle size (1.3 mm), yielding bio-oil (54%), biochar (26%), and syngas (16%). The cost of bio-oil production for 1 t yr⁻¹ was estimated to be US\$ 681.00. Financial analysis revealed a net present value (NPV) of US\$ 24,322.00 at 12% discount rate, an IRR of 343.85 %, with breakeven quantity of 199 L. Sensitivity analysis showed that an increased price of raw materials up to 30 %, and a decreased price of products down to 25 %, resulted to an increased NPV and IRR. Decreasing the bio-oil yield below 40 % gave a negative NPV with an IRR of 9%. If bio-oil and biochar were tapped as alternative bioenergy, 360,000 L of fuel oil and 259 t of coal could be saved. A total greenhouse gas emission of 749 t of CO₂ equivalent can be avoided. Thus, pigeon pea pyrolysis for bio-oil production provided a net positive energy output and was proven to be profitable investment, and environment-friendly as potential bioenergy resource to replace petroleum-based fuels.

Keywords: *Pigeon pea, Pyrolysis, Bio-oil, Environment, Techno-economic analysis, Engineering*

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NP

Thermal decomposition reaction kinetics of hematite ore

Chen, Zhiyuan , Zeilstra, Christiaan , Van der stel, Jan , Sietsma, Jilt , Yang, Yongxiang

In order to understand the thermal decomposition kinetics of hematite particles in inert atmosphere, thermogravimetry was employed for isoconversional analysis. The kinetic triplet was estimated from the experimental data and the isothermal reaction kinetics was predicted. The results indicated that the thermal decomposition could be divided into two stages, of which the activation energies were 636 kJ/mol and 325 kJ/mol, respectively. The exponential form of pre-exponential factor, $\ln(A/s^{-1})$, for the two stages were estimated to be 42.9 ± 6.6 and 14.1 ± 3.08 . At last, the kinetic mechanism of the first stage was suggested to match Sestak-Berggren model as $f(\alpha) = (1 - \alpha)^{1.38}$. The relatively slow reaction rate of the second stage was due to the slag formation during the reaction.

Keywords: *Isoconversional kinetics, Iron oxide, Hematite, Thermal decomposition, HIsarna, Engineering*

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Thermodynamic analysis and performance evaluation of a proposed novel combined cooling and power system

Garcia, John Carlo S., Berana, Menandro S.

A novel combined cooling and power (CCP) system, wherein an organic Rankine cycle is coupled with a compressor-driven ejector refrigeration cycle, is proposed. The ejector primary flow of this refrigeration system comes from one of the streams that is pumped from the condenser, which is unconventional from the existing studies wherein the turbine exhaust is its primary flow source. Parametric analysis was conducted to study the effects of the heat source and evaporator temperature, and entrainment ratio on the coefficient of performance (COP) and exergy efficiency of the proposed system using three working fluids, namely R123, R141b, and R245fa. In the novel setup, the COP improvement can be theoretically associated to the produced turbine power that reduces the power input to the system. Among the parameters observed, the entrainment ratio and evaporator temperature had the greatest effect on the performance of the system. The system exergy efficiency varies inversely with entrainment ratio and evaporator temperature; on the other hand, the COP improves with the increase in the evaporator temperature and decrease in the entrainment ratio. The performance of three working fluids was also investigated. Among the three refrigerants, the system that used R141b had the highest COP and exergy efficiency at 3.26 and 46.92%, respectively.

Keywords: *Combined cooling and power system, Ejector, Exergy analysis, Engineering*

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Topological consideration of 3-D local void structure for static holdup site in packed bed

Natsui, Shungo, Sawada, Akinori, Nogami, Hiroshi, Kikuchi, Tatsuya, Suzuki, Ryosuke O.

As for ferrous burden, the softening and melting (SM) behaviors greatly affect the cohesive zone thickness, position and shape. Ironmaking researchers have found that it's not appropriate to evaluate the blast furnace burdens only based on the SM behavior of single iron-bearing materials because the sinter will interact with acid materials at high temperatures. In present study, a new visual method has been given to research the SM behavior of five single iron ores and four types of mixed burdens. The results show that the SM properties of all iron ores in the cohesive zone (CZ) are enhanced through interactions at high temperature. Due to intense interaction at high temperature, SM behavior of the mixture burden A (containing lump ore L-A and sinter) is better than the mixture burden B (containing lump L-B and sinter), despite the lump ore L-A SM behavior is remarkably reduced compared with the lump ore L-B. Additionally, experimental results for melting and dropping of integrated burdens also prove that high temperature interaction is important for enhancing the performance of SM in ferrous materials and improving the permeability of the blast furnace.

Keywords: *Ironmaking blast furnace, Coke bed, Holdup site, Topological analysis, Engineering*

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Towards a green and sustainable electropolishing technology: feasibility studies on the application of choline chloride-based solvents for electropolishing aluminum

Dela Peña, Eden May, de Boda, Miguel Paolo, Napiri, Farley S

In this study, electropolishing of aluminum was performed using ethaline, an ionic liquid mixture of choline chloride and ethylene glycol, as polishing electrolyte. Polishing was conducted using a two-electrode system at electrode potentials of 4.5 V and 6.0 V. Electropolishing removed pre-treatment artefacts such as scratches and yielded a smooth aluminum surface. Surface analysis revealed the presence of nodular or hemispherical features in the electropolished metal. Surface roughness measurements indicate optimum electropolishing time of 25 minutes and 15 minutes at potentials of 4.3 V and 6.0 V, respectively. Ethaline is a promising ionic liquid electrolyte for electropolishing aluminum.

Keywords: *Electropolishing, Deep eutectic solvent, Aluminum, Choline chloride, Engineering*

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The use of artificial neural network for modeling coagulation of reactive dye wastewater using *Cassia fistula* Linn. gum

Thi Duong, Huong Giang, Bui, Ha Manh

Natural seed gum extracted from *Cassia fistula* Linn. (CF) was experimentally evaluated to treat reactive dye (Red 195) in an aqueous solution, whose color and Chemical Oxygen Demand (COD) were to measure the treatment

efficiency. To investigate five parameters i.e. pH, reaction time, agitation speeds, dye concentration and CF gum concentration were used to implement a one-factor-at-a-time experiment with Jar-test apparatus. Carried out under weak basic condition (pH 10) for 30 min, the COD and decolorization efficiency of the dye stuff wastewater was observed at 42.4% and 57.8%, respectively. A single-layer Artificial Neural Network (ANN) model was also developed to predict the removal efficiency of the dye by using the determination coefficient (R^2) and the root mean square error (RMSE). The observed and predicted outputs were found to be 0.924 and 3.759, respectively. Furthermore, the ANN model was analysed using Garson's algorithm, connection weight method, and neural interpretation diagram to understand the influence of each operation factor on the treatment process.

Keywords: *Artificial neural network, Dye removal, Natural coagulant, Reactive red 195, Engineering*

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0197

Using GIS to locate waste bins: a case study on Kolkata City, India

Krishna, Akhouri Pramod , Dutta, Amit , Paul, Koushik

Environmentally acceptable management of Municipal Solid Waste (MSW) has become a challenge due to limited resources, increasing population and rapid urbanization. Kolkata city, with an area of 187.33 km² and a population of about 10 million (including a floating population of about 6 million), generates about 3,500 MT of solid waste per day. Daily disposal rate of solid waste at Dhapa exceeds 3,000 MT d⁻¹ while at Garden Reach the disposal is 100-150 MT d⁻¹. Conservancy staff collects waste from households and streets and dumps them at skips/MS containers (55%) or at open vats (45%). Collected waste is transported directly to disposal ground at Dhapa by KMC departmental vehicles and KMC-hired vehicles. Lack of proper planning and inadequate data regarding solid waste generation and collection compound the solid waste management problem. GIS as a tool can recognise, correlate and analyse relationship between spatial and non-spatial data- it can thus be used as a decision support tool for efficient management of the different functional elements solid waste e.g. bin location, number of bins required, waste transportation, generating work schedules for workers and vehicles. This study examines GIS application in assisting locational analysis of waste bins in Kolkata and optimise the overall solid waste collection process.

Keywords: *Municipal Solid Waste (MSW), Bin location, Geographic Information System (GIS), Kolkata Municipal Corporation (KMC), Solid Waste Management (SWM), Engineering*

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NP

0198

Viscosity measurements of CrO-bearing CaO–SiO₂–5%Al₂O₃–CrO slag equilibrating with metallic Cr

Yuan, Fang, Zhao, Zhen, Zhang, Yanling, Gao, Jintao, Wu, Tuo

This paper presents a fundamental investigation of the effects of CrO on the viscosity and degree of polymerization (DOP) of CaO–SiO₂–5%Al₂O₃–CrO ($R=0.5$ and 0.8) slags for the purpose of efficiently recycling the valuable elements from the steelmaking slags. The results show that both Cr₂O₃ and CrO have a basic characteristic when $R=0.5$ and 0.8 . The slag viscosity decreases with increasing CrO content and the CrO acts as a network modifier based on calculated DOP variations of quenched slags. The activation energy of the CrO content further validates these observations. The DOP is also found to increase with the addition of Al₂O₃.

Keywords: Viscosity, CrO-containing slag, Bivalent chromium, DOP, Engineering

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0199

A visual PCI blockage detection in blast furnace raceway

Wang, Yutao

The pulverized coal injection (PCI) blockage detection is critical to the stable operation of blast furnace. In recent years, tuyere cameras have been widely applied, which provides a channel to detect the PCI blockage. However, the visual impression of images strongly varies between different raceways, it requires detection method should be robust and convenient to fine-tune for different blast furnace images. This paper presents an intelligent image-based method to detect the PCI blockage. An adaptive image preprocessing technique combining de-noising algorithm and image enhancement algorithm is applied to remove image noise and improve image quality, laying the foundation for subsequent work. The fitting ellipse based on Hough transform is used to locate the tuyere region, which can separate the tuyere region from the background. The adaptive threshold segmentation algorithm combining Otsu and Bernsen is used to obtain binarized image. However, it is difficult to obtain the pulverized coal cloud only by binarization due to the similarity between pulverized coal cloud and lance in gray-level. The multi-scale fully convolutional network (FCN) based on deep learning is investigated to detect the lance region, and pulverized coal cloud can be extracted by removing lance in binarized image. The flow rate of PCI can be characterized by the extracted area information to some extent, which can be used to detect PCI blockage. Extensive videos captured from real production lines are used to evaluate the detection method. The experiment results show that the method can accurately detect the PCI blockage.

Keywords: Blast furnace, PCI blockage, Image processing, Adaptive image preprocessing, Hough transform, Fully convolutional network, Engineering

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0200

Vulnerability to flooding of the towns of Mabitac and Santa Maria, Laguna, Philippines

Pacardo, Enrique P., Alcantara, Antonio J., Franco, Danielito T., Pati, Romeo C., Resurreccion, Arsenio N.

The combination of flood modelling and socio-economic analysis was used to determine the flood vulnerability of the towns of Santa Maria and Mabitac, Laguna, Philippines. Geographic Information System (GIS)-hazard mapping and vulnerability-resilience indicator were used to assess the interaction of a flood hazard and the socio-economic conditions of the people in the area. The Hydrologic Engineering Center Hydrologic Modelling System (HEC-HMS) and Hydrologic Engineering Center's River Analysis System (HEC-RAS) modelling system was used to derive the synthetic hydrograph and delineated the inundated areas in the flood-prone barangays (village) of Santa Maria and Mabitac. The flood modelling predicted the flood depths in seven out of ten communities and delineated the inundated barangays of the two towns. The social vulnerability analysis indicated that Barangays (village) Jose Rizal, Masinao, Adia and Coralan in Santa Maria and Barangays San Antonio, Libis ng Nayon, Bayanihan, Pag-asa, Nanguma and Lambac in Mabitac are very vulnerable to flooding. The study revealed environment-related aspects that are helpful in reducing the impacts of flooding such as, strengthening the flood warning system and emergency response capacity through flood hazard zonation mapping and rehabilitation of the watershed in Santa Maria.

Keywords: GIS mapping, Social vulnerability, Flood modelling, Engineering

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ENVIRONMENTAL SCIENCE

0201

Adaptive capacity index of public schools in the municipalities of Bay and Los Baños, Laguna Philippines

Lasco, Rodel D. , Quimbo, Maria Ana T. , Espaldon, Maria Victoria O. , Ardales, Jr., Gregorio Y., Zamora, Oscar B.

An instrument to measure School Adaptive Capacity Index was developed using livelihood assets and school management as the main determinants using the theory driven approach to indicator development. Randomly selected teachers from the 38 public elementary and high schools from Bay and Los Baños Laguna, grouped according to the effects of floods experienced, were interviewed. It was found that the schools in general were highly adaptive. High schools have better human and physical assets than elementary schools, while non-flooded schools have better natural assets than flooded schools. SACI of high schools were significantly higher than elementary schools. On the other hand, flooded and non flooded schools have more or less the same SACI. School management and social assets were vital in increasing the adaptive capacity of schools in the different groups. Scores in a particular asset may vary between groups and within each group implying that there is no uniform approach to improving the adaptive capacity and that interventions should always consider the uniqueness among each of these schools. The instrument developed is highly recommended to assess the institutional adaptive capacities of other schools to floods.

Keywords: School adaptive capacity index, Sustainable livelihood framework, Adaptability to floods, Environmental science

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0202

Adoption and impacts of ecologically-based rodent management in the Mekong Delta Region

Datar, Francisco A. , Contreras, Antonio P. , Torres, Cleofe S. , Sumalde, Zenaida M. , Palis, Florencia G.

Since 1995, the Australian Center for International Agricultural Research has funded eight ecologically-based rodent management (EBRM) projects to address rodent problems in three countries in Mekong Delta Region, namely: Vietnam, Lao PDR, and Cambodia. This paper aims to analyze the adoption and impacts of EBRM among rice farmers in Cambodia, Lao PDR, and Vietnam; the facilitating and constraining factors in its adoption, and lessons learned that could guide EBRM implementation in the future. The study utilized more of a qualitative approach anchored on an impact pathway framework. Data were gathered through focused group discussions among farmers from 19 villages, key informant interviews among key cooperators from collaborating agencies, and review of project documents and scientific papers published from the projects in the three countries. The ACIAR rodent control projects have brought about widespread adoption and significant impacts- economic, environmental, and socio-cultural- of EBRM in Vietnam but were limited in Lao PDR and Cambodia. The

interplay of political, socio-cultural, historical, and economic factors is critical in the adoption of EBRM, and therefore, must be considered in promoting EBRM.

Keywords: *Ecologically-based rodent management, Rodent control, Community trap barrier system, Dissemination, Adoption, Environmental science*

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0203

Adsorption and biomass concentration of thraustochytrid *Schizochytrium aggregatum* (Goldstein and Belsky) in Bunker C oil

Tornalejo, Jilla A., Roncal, Juan Clemente A., Bondoc, Lyle Arianne J., Feril, Joseph G., Malagad, John G., Torrado, Edmar S., Sibonga, Dolores N., Torrigue, Ma. Lona T., Gellada, Lorna D., Sarinas, Brian Gil S.

Diverse array of microorganisms such as bacteria, fungi and protists are involved during oil spill. Each microorganism has its own specific function whether it has to degrade or adsorb hydrocarbons. One important microorganism is the Thraustochytrid that is a fungoid protist and are common in marine and estuarine habitats. Numerous studies existed on the biodegradation and adsorption of Thraustochytrids on various substances but not on Bunker C oil. Thus, this study aimed to determine the adsorption capacity and mean biomass of Thraustochytrids in Bunker C oil using different cell densities measured in grams. All of the three treatments or cell densities (1×10^5 cells ml^{-1} , 1×10^6 cells ml^{-1} and 1×10^7 cells ml^{-1}) were triplicated and average values were recorded. Oil dispersant was used as a control. It showed that Thraustochytrid with 1×10^7 cells ml^{-1} showed the highest adsorbed oil (.057 g/g) among the three cell densities and showed significant difference at $p = .01$ but comparable to the control (.066 g/g). In terms of biomass concentration, all cell densities showed no significant difference at $p = .01$. Thraustochytrid is a promising tool during oil spill because it has the capacity to adsorb oil.

Keywords: *Thraustochytrid, Adsorption, Biomass, Bunker C oil, Environmental science*

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0204

Agro-environmental sustainability of conventional and organic vegetable production systems in Tayabas, Quezon, Philippines ***Oliquino-Abasolo, Anacorita, Zamora, Oscar B.***

Environmental burdens of the different components of conventional and organic vegetable productions systems in Tayabas, Quezon were evaluated using the Life Cycle Assessment (LCA) approach. The study quantified the material inputs, outputs and emissions in a defined boundary, from land preparation to transport to market. Impact categories evaluated were global warming (GWP), acidification (AP), eutrophication (EP) and human toxicity (HTP) potentials based on the functional units of 1 kg and 1 ha production area. Conventional vegetable farming contributions to global warming potential was $2.12\text{E-}01$ kg CO_2 equivalent kg^{-1} of vegetable which was 43% higher than organic farming ($1.21\text{E-}01$ kg CO_2 equivalent kg^{-1} of vegetable). Acidification potential of conventional ($4.76\text{E-}03$ g SO_2 equivalent kg^{-1} of vegetable) was 23% higher than organic vegetable production ($1.06\text{E-}03$ g SO_2 equivalent kg^{-1} of vegetable). Organic farming contributed $3.03\text{E+}00$ kg PO_4 equivalent kg^{-1} of vegetable potential eutrophication which was 16% higher than conventional with only $4.70\text{E-}01$ kg PO_4 eq kg^{-1} of vegetable. The application of chemical pesticides of conventional farms contributed to human toxicity potential calculated for both soil and air compartments. Cypermethrin had the highest total human toxicity in soil and air

with $7.88\text{E}+06 \text{ g 1,4 DCB-eq ha}^{-1}$ and $1.84\text{E}+02 \text{ g 1,4 DCB-eq ha}^{-1}$, respectively. Organic farms had zero human toxicity potential in this study since organic farmers did not use synthetic pesticides. This study provided evidence on the possible environmental contributions to emissions of conventional and organic vegetable production systems.

Keywords: *Environmental burden, Life cycle assessment, Organic, Vegetable production, Environmental science*

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0205

Not all nitrogen is created equal: differential effects of nitrate and ammonium enrichment in coastal wetlands

Bowen, Jennifer L., Murphy, Anna E., Giblin, Anne E., Bulseco, Ashley N., Deegan, Linda A., Johnson, David S., Nelson, James A., Mozdzer, Thomas J., Sullivan, Hillary

Excess reactive nitrogen (N) flows from agricultural, suburban, and urban systems to coasts, where it causes eutrophication. Coastal wetlands take up some of this N, thereby ameliorating the impacts on nearshore waters. Although the consequences of N on coastal wetlands have been extensively studied, the effect of the specific form of N is not often considered. Both oxidized N forms (nitrate, NO_3^-) and reduced forms (ammonium, NH_4^+) can relieve nutrient limitation and increase primary production. However, unlike NH_4^+ , NO_3^- can also be used as an electron acceptor for microbial respiration. We present results demonstrating that, in salt marshes, microbes use NO_3^- to support organic matter decomposition and primary production is less stimulated than when enriched with reduced N. Understanding how different forms of N mediate the balance between primary production and decomposition is essential for managing coastal wetlands as N enrichment and sea level rise continue to assail our coasts.

Keywords: *Reactive nitrogen, Salt marshes, PIE LTER, Nitrogen cycling, Carbon cycling, Environmental science*

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0206

Analysis of heavy metals in Cebu City Sanitary Landfill, Philippines

Galarpe, Van Ryan Kristopher R., Parilla, Richard B.

Selected heavy metals in leachate and groundwater in Cebu City Sanitary Landfill (CCSL), Philippines were studied. Levels of Pb, Cd, Cr, and Cu in total form were determined by Flame- AAS and Hg by cold vapor AAS. Study commenced on April, May, August, and October of 2010 covering wet and dry seasons. Studied leachate stations exceeded the standards for Pb (0.1968 mg L^{-1}) and Hg ($0.14838 \text{ mg L}^{-1}$) with risk quotient (RQ) values >1 . Groundwater stations exceeded the standard for Pb (0.0371 mg L^{-1}) and Cd (0.0042 mg L^{-1}) with $\text{RQ} >1$. It can be inferred that the groundwater adjacent to CCSL was slightly impacted by leachate metal constituents. Therefore, it is recommended that further monitoring would be carried out and the leachate would be contained to protect the groundwater prior to CCSL closure.

Keywords: *Heavy metals, Leachate, Cebu City, Landfills and groundwater, Environmental science*

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2014,

Assessing rainfall contribution to storm flow on a small forested catchment in Republic of Korea

Gevaña, Dixon T. , Lee, Sang Ho, Im, Sang

The TOPMODEL was employed to analyze rainfall contribution to runoff generation in a 58.3-ha Myeongseong catchment in Korea. The parameters of the model were calibrated using Monte Carlo simulation by comparing the observed and simulated runoff volume across nine recorded storm events. Parameter estimations gave the model an efficiency of 0.93 for the entire event set. Mean fraction of rainfall to storm flow was 23.1 %, ranging from 5.6 to 48.3 %. Variations were also observed in rainfall contribution related mainly to antecedent moisture conditions and other hydrological properties of the catchment. Quick response flow that was estimated from the saturated overland flow in the model comprised 41.9 -75.9 % of the total runoff for nine storm events, while base flow accounted for 41.7 % of streamflow for all events. No significant relationship between rainfall amount and quick response flow was found. This study introduced a modeling approach to identify the source of streamflow on a forested catchment. Difficulties in predicting accurately the runoff were encountered. In general, immense and high quality data are required to overcome the complexity of hydrologic processes that occur in forested catchments.

Keywords: *Hydrology, Runoff, Storm, Streamflow, TOPMODEL, Environmental science*

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Assessing vulnerability to climate change impacts in Cambodia, the Philippines and Vietnam: an analysis at the commune and household level

Ballaran, Jr., Vicente G. , Arias, Jamie Kim B. , Mendoza, Maria Emilinda T., Naret, Heng

The study takes on the framework that vulnerability to climate change depends on the interrelationship of key elements of exposure, sensitivity, and adaptive capacity (Adger, 2006). The general objective of the study is to arrive at an understanding of the community and household vulnerability in three study areas: Kampong Speu in Cambodia, Laguna province in the Philippines, and Thua Thien Hue in Vietnam. Specifically, it aims 1) to measure communes'/ barangays' relative vulnerability in the selected study sites; 2) to analyze social vulnerability of local communities in terms of underlying problems; and, 3) to measure and explain the vulnerability of households in relation to their economic and demographic features. Community level and household level surveys were conducted to gather data for the vulnerability analysis, in combination with qualitative data gathering tools such as key informant and in-depth interviews and focused group discussions. About two thirds of communes/barangays in the studies sites were identified as highly vulnerable. These are mostly communities in lowland and coastal areas; especially communes / barangays with relatively high incidence of poverty, with large areas devoted for agricultural activities and with poor infrastructure facilities. On the other hand, household characteristics found to be related to vulnerability to climate-related risks and hazards include household income, types of livelihood, family size, education of the household head, and the level of exposure to identified hazards. Households living on natural resource-based livelihood are likely to be more vulnerable as these livelihoods are more exposed to and more sensitive to climate hazards. Most poor households are found to be vulnerable. Low adaptive capacity was found to be a key determinant of household vulnerability to climate change across countries. Women were found to be more vulnerable to climatic hazard than men due to limitation in skills and opportunities but they were given more responsibilities in taking care of family member during risk hazard response and

rehabilitation periods. An over representation of women during response and rehabilitation periods was found across the study sites.

Keywords: *Climate change, Vulnerability, Exposure, Sensitivity, Adaptive capacity, Environmental science*

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0209

Assessment of changes in agroecosystem health in Guangzhou, China
Chen, Yajuan , Ling, Xiao , Peart, Mervin Richard , Zhang, Qiuping , Guan, Dongsheng

Agroecosystem health refers to the extent to which a healthy agroecosystem can meet socioeconomic and biophysical needs of all residents over time. According to the attempts at assessing agroecosystem health, agroecosystem health depends on both functional and structural characteristics at regional level. However, both functional and structural characteristics have been altered from their natural state by industrialization and urbanization. Thus, this study reports a system-based assessment index to evaluate the health statue of agroecosystem in Guangzhou, South China. Agroecosystem health index (AHI) of Guangzhou decreased from 0.78 in 2000 to 0.71 in 2010. It indicated that this agroecosystem was at relatively healthy state. However, functions of both cultural service and economic sustainable development were not successful as they represented 'worst' and 'sub-healthy', respectively. With the decreased values between 0.7 and 0.9, the other indices also revealed the need for caution. Particularly, both habitat structure index and provisioning service index exhibited well defined declines during this study period. This study suggests that AHI can be potentially employed to monitor the temporal change in agroecosystem health status, although AHI has some certain limitations and needs further improvement for the complexity of agroecosystems.

Keywords: *Agroecosystem, Agroecosystem health, Agroecosystem structure and functions, Guangzhou South China, Environmental science*

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0210

Assessment of fruit bats and its food preferences in Mt. Apo Natural Park, Kidapawan City, North Cotabato, Philippines
Baril, Joselito A. , Relox, Richel E., Florece, Leonardo M. , Coladilla, Jesusita

Fruit bats are important seed dispersers that aid in natural forest regeneration in degraded areas. This study assessed fruit bat species in a portion of Mt. Apo, Kidapawan City, North Cotabato from September to December 2010 covering six habitat types: human settlement area/residential area, agro-ecosystem/cultivated area, secondary forest/ reforested site, forest edge, riverine/riparian area and montane forest for 1,118 net night hours. The food habits of the bats were also determined based on fecal examination and dropped fruits, which were verified through secondary information using indigenous knowledge interviews. A total of five bat species were noted such as *Cynopterus brachyotis* (n=83), *Haplonycteris fischeri* (n=33), *Ptenochirus minor* (n=25), *Macroglossus minimus* (n=20) and *Ptenochirus jagori* (n=12) wherein almost 50% of these are Philippine endemics and could be considered as seed dispersers of diverse trees. This study recommends the protection of Philippine and Mindanao endemic fruit bats such as *P. minor*, *H. fischeri* and *P. jagori*, through the conservation of their staple food (*Ficus* species) and the remaining primary forest habitat.

Keywords: *Conservation, Food habits, Forest, Fruit bats, Mt. Apo, Environmental science*

Assessment of the household's flood social vulnerability in Vietnam's Mekong River Delta

Shunbo, Yao , Da Hanh, Tran Minh , Anh, Ho

Flooding is a natural phenomenon that occurs annually from September to October in Vietnam's Mekong River Delta (MRD). However, its trend is becoming more destructive and unpredictable in recent years, which tends to threaten people's livelihood, properties, and health. This study attempted to examine the flood vulnerability among households in 14 districts of the delta. The analysis helped identify communities that were subjected to floods and needed more attention in disaster management. People in the MRD had remarkably low exposure, which was the result of investment in water structures. About 59.2 % of the surveyed households were moderately vulnerable to flooding. Families in O Mon, Thanh Binh, Cai Be, and Cho Lach district had the highest vulnerability indices. The most significant indicators to explain the flood-prone state were rice-related indicators, elderly dependency ratios, and social capital. The study suggested that plans to reduce flood vulnerability should focus on the family's adaptability because it had the largest impacts.

Keywords: *Flood, Vulnerability, Principal component analysis, Vietnam Mekong River Delta, Environmental science*

Beneath 50 m of NW Pacific Water: coral reefs on the Benham Bank Seamount off the Philippine Sea

Aliño, Porfirio M. , Quimpo, Fra-and Timothy R. , Licuanan, Wilfredo Roehl Y. , De Jesus, Diovanie O. , Hernandez, Homer B. , Roa-Chio, Patrice Bianca L. , Nañola, Jr., Cleto L. , Meñez, Lambert Anthony B. , Dizon, Romeo M. , Nacorda, Hildie Maria E., Villanoy, Cesar L.

The benthic habitats on the Philippine (Benham) Rise were unknown until the joint University of the Philippines Marine Science Institute (UPMSI)/University of the Philippines Los Baños (UPLB)/Department of Agriculture-Bureau of Fisheries and Aquatic Resources (DA-BFAR) cruise of May 2014 when extensive coral reefs were discovered on the summit of the Benham Bank Seamount. Short observational surveys of five stations at depths up to 55 m revealed that the reefs were pristine and with excellent cover mostly by tiered, thick, rigid and foliose plate-forming *Porites* (*Synaraea*) *rus*. The voucher specimen collections indicated that there are at least 11 reef-building and two solitary coral species in the reef communities. The fish visual census and random hook-and-line fishing surveys recorded 62 species, 16 of which were reef health indicators and the rest were commercially exploited species. These short surveys yielded the first records of mesophotic coral reef biodiversity on the Benham Bank, albeit incomplete, and point to the inevitable requisite of further exploring these pristine reefs and their associated benthic habitats, since this Philippine natural heritage serves as an important area for fisheries.

Keywords: *Mesophotic coral reefs, Reef fish, Benham Bank Seamount, Philippine (Benham) Rise, Philippine Sea, Environmental science*

0213

Carbon sequestration and climate change impact on the yield of bagras (*Eucalyptus deglupta* Blume) in bagras-corn boundary planting agroforestry system in Misamis Oriental and Bukidnon, Philippines
Carandang, Wilfredo M. , Palma, Richmond A.

Bagras-corn boundary planting agroforestry system for biomass production and climate change mitigation is essential options for smallholder agroforestry farms in Misamis Oriental and Bukidnon, Philippines. In this study, the multiple linear regression analysis was used to develop an appropriate prediction models for yield and biomass expansion factor from soil chemical properties, physiographic characteristics, stand attributes, rainfall and temperature. Results showed strong association of age, site index, temperature and spacing with yield (88.7 %). Based on the model, the predicted biomass accumulation at 52 trees per hectare was 24.44, 73.07 and 78.67 Mg ha⁻¹. The mean annual aboveground biomass accumulation was 24.44, 7.31 and 3.93 Mg ha⁻¹ y⁻¹ at ages 1, 10 and 20 years. The equation developed had shown the predicted positive response of bagras to future changes in seasonal mean temperature. Establishing bagras at a distance of 2 m, site index equal to 19 m, age set at 10 y was predicted to yield 0.1974 m³ per tree in 2020. At 2050, yield was predicted to balloon to approximately 3.1182 m³ per tree. Yield and biomass production in boundary plantings can be highly variable – dependent on environmental and soil characteristics and tree spacing.

Keywords: *Agroforestry, Boundary, Climate change, Yield, Carbon sequestration, Environmental science*

0214

Carbon Stock Evaluation of Selected Mangrove Forests in Peninsular Malaysia and its Potential Market Value
Hemati, Zhila , Hong, Liu Chai, Zakaria, Rozainah

Mangrove forest has a big potential to become a new market for carbon trading. The purpose of this study was to estimate the amount of carbon stored and its potential carbon market value in undisturbed mangrove forest; Kuala Selangor Nature Park (KSNP) and degrading mangrove forest; Sungai Haji Dorani (SHD) thereby create awareness on how preserving the natural mangrove forest in Malaysia really pays. The carbon content of seasonally-sampled selected mangrove living vegetation and soil was determined using the LOI furnace method followed by a conversion factor. The carbon content for the soil and above-ground biomass in the undisturbed forest was greater than in the degrading forest; while the carbon stored below-ground surprisingly showed a reversed pattern. The total ecosystem carbon stock in undisturbed KSNP was estimated at 246.21 t ha⁻¹ C which is relatively higher than that in the degrading forest in SHD with 151.40 t ha⁻¹ C. It was also estimated that the minimum carbon credit value for the mangrove forest in the SHD and KSNP was USD 3,314.23 ha⁻¹ and USD 5,89.83 ha⁻¹ respectively, based on the market price in the voluntary market. The undisturbed mangrove forests have a higher potential for economic return in carbon credits.

Keywords: *Mangroves, Biomass, Carbon sink, Carbon market, Environmental science*

Climate change adaptation strategies of smallholder agroforestry farmers in the Philippines

Tolentino, Lutgarda L. , Visco, Roberto G. , de Luna, Catherine C. , Cabahug, Rowena D. , Paelmo, Roselyn F. , Landicho, Leila D.

This article argues that smallholder agroforestry farmers in the selected provinces in the Philippines have already been experiencing climate change in their respective areas as indicated by the change in the rainfall and temperature patterns. Using direct interviews and focus group discussions, the respondent-farmers highlighted that increased incidence of pests and diseases, stunted growth of crops, low crop productivity, delayed planting, delayed fruiting of some crops particularly perennial species, poor quality of produce, increased cost in farm operations, low income and decreased yield of some crops, are among the general impacts of climate change in their agricultural production systems. On the positive aspect, some crops had increased yield as an impact of climate change. The farmers employ their local knowledge and skills in adapting to the impacts of climate change. Among these include changing cropping patterns, integrating more crops in the farm, engaging in other off-farm and non-farm activities as additional source of income, changing the cultivated crops, mulching, and using organic fertilizers, among others. This article also highlights the benefits that the respondent-farmers derive from agroforestry, a land use management system that is currently being practiced in the study sites.

Keywords: *Climate change, Agroforestry, Local knowledge, Agricultural production systems, Impacts, Environmental science*

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Climate change awareness and farm level adaptation of farmers (Central Dry Zone) in Monywa Township, Sagaing Region, Myanmar

Lalican, Nelita M. , Espaldon, Maria Victoria O. , Pulhin, Juan M. , Maung, Myo Win

Climate change will affect the agricultural productivity in dry zone area due to insufficient knowledge, inadequate human capacity development, and limited institutional interventions dealing with farm level climate change adaptation. This paper examined factors influencing climate change awareness, the effects of climate change as perceived by farmers and farm level adaptations practiced by farmers in coping with climate variation and other factors in Myanmar. One hundred fifty respondents were interviewed from three geographical strata in Monywa Township (Central Dry Zone), Sagaing Region, in Myanmar namely upstream, midstream and downstream. Climate change awareness influenced by socio-economic and institutional factors can provide the effective decisions for better farming practices to minimize the risks of climate variation in rainfed areas. The development and application of relatively simple and reliable methods for assessing the impacts of climate change and adaptation strategies at the agricultural system and/or household level are still demanded to provide timely recommendations for alternative technologies and policies.

Keywords: *Climate change, Adaptation, Agriculture, Environmental science*

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Community-based resource assessment and management planning for the rice terraces of Hungduan, Ifugao, Philippines

Canceran, Myranel S. , Dizon, Josefina T. , Sajise, Asa Jose U. , Codilan, Analyn L. , Bantayan, Nathaniel C. , Calderon, Margaret M.

This study describes how the use of community-based participatory approaches and the Ifugaos' indigenous knowledge system (IKS) were harnessed in the conduct of resource and damage assessment, mapping, and the preparation of management plans for four clusters corresponding to four subwatersheds in Hungduan, Ifugao, Philippines. The Ifugaos' indigenous knowledge was evident in the identification of the ownership and location of terraces and woodlots, and the use of natural landmarks and boundaries in locating properties, sitios and barangays on maps. Their IKS was complemented with trainings to build capacities on resource assessment such as the use of satellite-based navigation and positioning system, survey instruments, and grid-based assessment and in developing management plans. The community-based resource assessment estimated the total areas of rice terraces in Clusters 1, 2, 3 and 4 to be 623 ha, 631 ha, 1,171 ha and 637 ha, respectively, while the damaged terraces ranged from 13% to a maximum of 20%. Abandoned terraces were found to be minimal. Outputs in the form of management plans were the product of the interaction of the different farmer groups and the available resources, strategies and achievable recommendations for the sustainability and protection of their rice terraces. Complementing indigenous knowledge with science and recent research techniques is effective in generating reliable information needed in the development of management plans for the conservation and protection of natural resources.

Keywords: *Community-based management planning, Indigenous knowledge systems, Resource assessment, Damage assessment, Environmental science*

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NP

Comparison of contingent valuation and travel cost method in estimating the recreational values of a forest park in Iran

Jahanifar, Komeil

Today, countries that focus more on economic development considers the tourism industry as a major contributor to it. As one of the major field of tourism, ecotourism is seriously promoted. Estimating monetary value of environmental resources of ecosystem function is a method for understanding if the investments for conservation, improvement or revival of the environmental resources earned social welfare improvements. In this study, The recreational value of Bamo National Park (BNP) was estimated and measured using two methods of Contingent Value Method (CVM) and Travel Cost Method (TCM). The variables, inhabitation, distance from park, first visit, number of visit, deontologist, education, travel cost, visitors income, museum existence and existence of animal species were the effective variables on willingness to pay (WTP) of visitors in 2015. Monthly expected willingness to pay of Consequentialist and Deontologist visitors was US\$ 2.08 and 2.47, respectively. Finally, the recreational value of Bamu Park, which were estimated in two methods was equivalent US\$ 43940.47 and 79959.25, respectively, in 2015. The travel cost method used the market price information and it revealed there is willingness to pay and 90.7% of visitors have zone inhabitation. Further, travel cost function was ideal for the econometrics theoretical aspect and preferred using the travel cost method instead of contingent value method to valuating the Bamo National Park.

Keywords: *Contingent Valuation Method, Double Bounded Dichotomous Choice, Travel Cost Method, Bamo National Park, Environmental science*

Concentration and source of trace metals in street dust from an industrial city in semi-arid area of China
Lu, Xinwei

The concentrations of trace metals in street dust of Baotou, an industrial city in semi-arid area of northwest China, were determined by X-ray fluorescence spectrometry. Sources of trace metals analyzed in the dust were identified based on their concentrations, enrichment factor and multivariate statistical analysis. The results indicate that the street dust of Baotou has elevated concentrations of Ba, Co, Cr, La, Pb and Sr, which are 1.2–4.7, 4.0–10.7, 1.7–5.8, 1.0–5.1, 1.2–8.7 and 1.5–2.6 times the background values of local soil, respectively. Cr, Pb, Ba, La and Sr in the dust were moderately enriched, while Co was significantly enriched. Cu and Zn had low concentrations to moderately enriched. Other determined trace metals were of low concentrations to minimally enriched. Hf, Zr, Ti, Y, Th, U and Ni mainly originated from natural sources. Ga, Sr and Co are primarily derived from industry and construction sources. La, Mn, V, Cr, Ba, Pb, Cu and Zn have mixed natural, industrial and traffic sources.

Keywords: *Metal, Dust, Source, Multivariate statistical analysis, Industrial city, Environmental science*

Conservation under regional industrialization: fragmentation and cover change in a forest reserve

Ruzol, Clarissa D. , Padilla, Cherry S. , Leyte, James Elwyn D. , Alcantara, Evangeline L. , Mapacpac, John Christian V. , Coladilla, Jesusita O. , Vergara, Dante Gideon K., Siagian, Dedy Romulo

Buffer zones are established along the perimeters of reserves for their protection. The literature is replete with examples of development in buffer zones that have been detrimental to the conservation efforts of the reserve. Barangay Puting Lupa in Calamba City, Philippines is adjacent to Zone 3 of the Mount Makiling Forest Reserve (MMFR). Despite industrial and settlement development in the periphery, the forest recovered its northwestern sub-watershed, as evidenced by satellite imagery, showing reduced fragmentation. Although the conservation strategy for MMFR changed from settler antagonism to a participative approach, other factors were involved that brought about the possible unassisted forest regrowth. Low density settlement development with corporate social responsibility committed to wildlife conservation; high demand for skilled labor due to rapid regional industrialization and urbanization; an aging corps of original farmers; the high regard of Filipino families for their children's education for better opportunities in life; and the livelihood preference of family members other than farming in lands with no security of tenure; all combined in an auspicious mix of factors to bring about apparent partial abandonment of farming within Zone 3 of the MMFR and conservation in the buffer zone. The forest recovered, and with decreased fragmentation, indicative of enhanced forest integrity.

Keywords: *Makiling Forest Reserve, Buffer zone, Industrialization, Urbanization, Participatory conservation, Community organizing, Forest fragmentation, Forest regrowth, GIS/RS, Environmental science*

Correlation studies of arsenic level in drinking water and blood samples of females in District Sheikhpura, Pakistan

Cheema, Kausar Jamal , Abbas, Moneeza

Arsenic contamination of drinking water has become a major health concern all over the world. Pakistan is also facing an arsenic contamination in drinking water. The present study determined the correlation of arsenic level in drinking water and blood sample of females of District Sheikhpura, Pakistan. The study area for the present research work is District Sheikhpura, which is an industrial as well as an agricultural city in the province of Punjab, Pakistan. The arsenic concentration in drinking water from different sources used by the inhabitants and blood samples of females was measured by using Atomic Absorption Spectrophotometer (AAS). The drinking water of tehsils Sheikhpura and Sharaqpur had higher arsenic as compared to other tehsils ($64.25 \pm 2.55 \mu\text{g L}^{-1}$ and $61.63 \pm 2.73 \mu\text{g L}^{-1}$) respectively, and was highest in all hands pumping water ($71.14 \pm 2.6 \mu\text{g L}^{-1}$). Mean arsenic concentration in blood samples was highest in the age group of 23-25 years ($3.2 \pm 0.23 \mu\text{g L}^{-1}$) and being highest among respondents of tehsil Sheikhpura. A positive correlation between drinking water and blood samples when analyzed with respect to area and drinking water sources was found. Evidences suggest that the presence of arsenic in drinking water is likely to affect general metabolism and its accumulation in human. This appears to be linked with exposure of varying magnitude and duration.

Keywords: *Arsenic, AAS, Drinking water, Blood, Female population, Environmental science*

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Crisis probability curves (CPCs): a model for assessing vulnerability thresholds across space and over time

Acosta, Lilibeth A., Galli, Fausto

The paper discusses the concept, methods and application of the Crisis Probability Curves (CPCs) to assess vulnerability to droughts in selected regions in India, Portugal, and Russia using published data on susceptibility and water stress indices. The CPCs, which are estimated from regression models and represented in a diagram as contour plots, are a spatiotemporal vulnerability yardstick that estimates vulnerability levels and thresholds to the combined impacts of environmental stress and human susceptibility (or lack of adaptive capacity). As compared to the CPCs for Russia, those for India and Portugal tilt more towards the water stress axis. This implies that the level of vulnerability in the latter countries tends to be more sensitive to the changes in water stress level than socio-economic susceptibility. For a particular water stress level, however, the probability of crisis occurring in India is higher than in Portugal. India has thus the lowest vulnerability threshold. Using pooled and panel regression, the information for three case study regions was combined to develop a common measure of vulnerability thresholds. Building common or generic thresholds will allow comparison of vulnerability across regions, which can be useful for policy in terms of developing priority list for providing adaptation support in vulnerable regions. However, the results revealed that there is a risk of under- or overestimating vulnerability thresholds when comparing regions not only with different level, but also varying sources of vulnerability. Thus, more crucial than developing generic vulnerability thresholds is highlighting differential vulnerability through selection of appropriate susceptibility indicators.

Keywords: *Vulnerability, Adaptive Capacity, Drought, Climate Change, Susceptibility, Binary choice model, Environmental science*

0223

Crown fuel characteristics and allometric equations of *Pinus densiflora* in Gyeongbuk Province, Korea

Lee, Young Jin , Lee, Byungdoo , Lee, Sun Joo , Seo, Yeon Ok , Jang, Mina , Lumbres, Roscinto Ian C. , Kim, Sun

The crown fuel characteristics of the most dominant coniferous species in Korea, *Pinus densiflora*, were investigated in Gyeongbuk province, Korea. Allometric equations using DBH as independent variable were also developed for the estimation of crown fuel load (needles, branches: <0.5 cm, 0.5-1 cm, 1-2 cm, and 2-4 cm in diameter), crown volume, and aboveground biomass. The average crown bulk density in Youngju and Bonghwa was 0.47 kg m⁻³, while in Daegu, it was 0.29 kg m⁻³. The crown bulk density of needles and branches with a diameter of <1 cm was 0.21 kg m⁻³ in Youngju, 0.27 kg m⁻³ in Bonghwa, and 0.13 kg m⁻³ in Daegu. The average crown base height was 5.10 m in Youngju, 5.20 m in Daegu, and 3.60 m in Bonghwa. Overall, the *Pinus densiflora* stand in Bonghwa is more hazardous if crown fire occurs compared to the other study sites based on different crown fuel characteristics. The allometric models developed were able to explain at least 79% of the observed variation in the biomass and crown volume. For the aboveground biomass, Daegu had the highest mean tree biomass with 103.54 kg, followed by Youngju (67.35 kg) and then Bonghwa (37.72 kg).

Keywords: *Pinus densiflora*, Crown bulk density, Crown base height, Crown fuel load, Moisture content, Biomass, Environmental science

0224

Cultural beliefs, practices and productivity of the fishery resource in the island municipality of Capul, Northern Samar, Philippines

Cuevas, Virginia C. , Cabili, Tito M.

Capul is a small island municipality of Northern Samar situated along the swift flowing San Bernardino Strait. Typhoons often pass through the island especially during the Northeast monsoon season. The inhabitants' livelihood relies mainly on fishing combined with farming. Unstructured focused interview of the elders of the island on their different cultural beliefs and practices related to fishing was conducted. Fish catch was measured in one lunar month each during summer and typhoon seasons. Catch per unit effort (CPUE) was determined for each major type of fishing method. Multiple correlation analysis was used to determine the factors affecting fish productivity. The islanders still have strong beliefs and respect for deities and fairies supposed to be residing on specific areas of the island. These sacred places remain undisturbed and may have become fish sanctuaries. The inhabitants modified traditional fishing methods to suit their economic needs and condition. People's initiatives and peer pressure have diminished the use of illegal fishing methods in the island such as compressor, dynamite and poisonous plants. The fishery yield was high in comparison with that of other fishery resources of the country. The CPUE for fish net and hook and line methods were high. The inhabitants' cultural beliefs and practices may have led to the conservation of their fishery resource which gave the high yield. There are indications that the yield is sustainable.

Keywords: *Traditional fishing methods, Fishery productivity, Deities and fairies, Coral condition, Environmental science*

Design of a low-cost differential optical absorption spectroscopy set-up for simultaneous monitoring of atmospheric NO₂ concentration and aerosol optical thickness

Bacaoco, Miguel Y.

Air quality monitoring in urban areas is indispensable in understanding the environment and how anthropogenic factors contribute to the increasing volume of pollutants in the atmosphere. Differential optical absorption spectroscopy (DOAS) is a useful technique in identifying and quantifying trace amounts of air pollutants over a wide region. In this paper, a low-cost DOAS set-up was developed and was used to measure nitrogen dioxide (NO₂) concentration and aerosol optical thickness (AOT) in the University of the Philippines Diliman campus. The temporal variation of NO₂ concentration from the DOAS measurement was found to agree with the relative NO₂ integrated absorbance from 430-450 nm. A calibration curve was then constructed with calculated sensitivity of 4.467 per mg•mm-3 (8.540 per ppm). The concentration range of the low-cost set-up is also able to detect unhealthy NO₂ levels in the Philippines. Aerosol optical thickness was then retrieved and showed similar temporal variation with NO₂ throughout the duration of the experiment. The correlation was attributed to the photochemical reaction of NO₂ to NO₃⁻, which then forms into aerosol. Average daily AOT at different wavelengths was then determined and was compared to AERONET's data. The results were in agreement with each other and both displayed decreasing AOT at increasing wavelength, which is an expected behavior for a Mie-scattered light due to aerosol. More importantly, proof-of concept demonstration of low-cost DOAS set-up, capable of measuring trace amounts of NO₂ and AOT, was successfully performed. Results show that the low-cost design can provide an alternative, cheaper and portable atmospheric NO₂ and aerosol measurement technique with reliable sensitivity for environmental monitoring applications.

Keywords: *nitrogen dioxide (NO₂), aerosol, differential optical absorption spectroscopy (DOAS), urban air pollution, Environmental science*

Detection of organophosphate residues in selected crops in Benguet and Mt. Province, Philippines

Anacin, Carljhonson , Lasangen, Wileen Chiara T. , Fomeg-as, David Y. , Gomez, Jr., Romeo A. , Reyes, Gaudelia A.

High input agricultural systems refer to food production systems that use inorganic chemicals such as pesticides and fertilizer inputs intensively, with the aim of significantly increasing yield levels. This leads to the accumulation of pesticide residues and heavy metals in the crops and in the environment. This study was undertaken to determine the presence and concentration of toxic pesticide residues in cabbage, potato, and sweet peas in selected farms in Pactil, Mt. Data, Mountain Province and Loo, Buguias, Benguet. Through the use of gas chromatography (GC), findings show that about 18 pesticide residues (organophosphates) were detected in the crop samples. Furthermore, concentrations of toxic organophosphate residues were generally elevated and higher than MRL. A general default MRL of 0.01 mg kg⁻¹ applies where a pesticide is not specifically mentioned, which means that there is no established MRL. If the default level of 0.01mg kg⁻¹ is applied for those without MRL then almost all samples would be unsafe for consumption. Other vegetables crops, soil and water in the study area may also be analyzed for the presence of active compounds and other toxic chemicals.

Keywords: *Organophosphate, Pesticide residues, Pesticide residue accumulation, Maximum residue limit (MRL), Environmental science*

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0227

Dietary habits and distribution of some fish species in the Pansipit River-Lake Taal Connection, Luzon Island, Philippines

Briones, Jonathan Carlo A. , Rivera, Jed B. , Lazo, Stephanie M. , Favila, Abelardo M. , de Guzman, Jose Luis E. , Cabais, Arvin C. , Acojido, Marion G. , Legaspi, Kenoses L. , Mendoza, Milette U., Papa, Rey Donne S.

The interface between lakes and their outlet rivers is an interesting research site for fish community dynamics because it is immediately exposed to disturbances in lake ecosystems. In this paper, observations on the species composition, dietary habits and distribution of fish in the upstream area of Pansipit River - sole outlet of Lake Taal, were presented. Fish samples comprised of juvenile fish from 12 species, including four that were introduced. These non-native species were more abundant than native fish caught. Dietary analyses suggest that non-native fish have a wider dietary breadth compared to native fish and may be one reason why introduced fish populations have exceeded native fish populations in the area. Fish activity varied depending on time of day in certain sub-sites and these fishes aggregated in intermittent deep pools when water depth is uniformly low in the river during the dry season. These suggest that fish abundance in the area is associated with river water depth and other environmental factors. Overall, the study stresses the need for more indepth research in Pansipit River given its importance as a migratory path and its potential as a refugia for the riverine fish community.

Keywords: *Diet analysis, Echo-sounder, Hydroacoustic survey, River refugia, Tropical caldera lakes, Environmental science*

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0228

Different impacts of rainfall intensity on surface runoff and sediment loss between Huang-mian soil and brown soil

Gao, Yujiao

Huang-mian soil and brown soil are typical soils in Loess Plateau and Yimeng mountainous area, respectively. The differences of surface runoff and sediment loss between the two soils are important to special environmental protection management in two areas. In order to study the impacts of rainfall intensity on surface runoff and sediment from Huang-mian soil and brown soil, four simulated rainfalls were applied on fields with different soils on a laboratory scale. Huang-mian soil under $60 \times 10^{-3} \text{ m hr}^{-1}$ had the shortest runoff occurrence time, while brown soil under $30 \times 10^{-3} \text{ m hr}^{-1}$ had the longest time; Huang-mian soil under $30 \times 10^{-3} \text{ m hr}^{-1}$ had the most sediments; Huang-mian soil has less loss of phosphorus (P) in concentration than brown soil, which explains why Loess Plateau has more soil and water loss but less eutrophication than the Yimeng mountainous area. Under the same rainfall intensity, Huang-mian soil had more runoff volume than brown soil; however, higher rainfall intensity decreased the difference. Increasing rainfall intensity had more impact on sediment content in brown soil than Huang-mian soil. It also had more impact on nitrate nitrogen ($\text{NO}_3\text{--N}$) content in brown soil than ammonia nitrogen ($\text{NH}_4^+\text{--N}$) loss content in Huang-mian soil. Finally, suggestions were provided to reduce the harm of N and P loss in Huang-mian soil and brown soil regions.

Keywords: *N and P loss, Runoff, Sediment, Rainfall intensity, Huang-mian soil, Brown soil, Environmental science*

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0229

Diversity and distribution of freshwater fish assemblages in Lake Taal River Systems in Batangas, Philippines

Corpuz, Mark Nell C., Paller, Vachel Gay V., Ocampo, Pablo P.

An ichthyofaunal survey was conducted to evaluate the diversity and distribution of freshwater fishes in Looc, Magapi (inlets), and Pansipit (outlet) rivers surrounding Lake Taal (Batangas, Philippines) during the wet (July) and dry season (January) of 2011. The study collected 3,342 individuals comprising 37 species (19 families). In terms of fish species richness, 36 species were identified in Pansipit, whereas Looc and Magapi had 21 species each. The fish samples were mostly included euryhaline, secondary freshwater fishes. The three most abundant groups were eleotrids, cichlids, and gobiids. Shannon-Weiner's diversity indices ranged from 2.17–3.05, which suggest that the studied rivers were moderately to slightly impacted. Significant differences in the composition and abundance of native and introduced fishes for the two sampling seasons were also observed ($P < 0.05$), with native species being generally more diverse and abundant than non-native species. A high similarity level ($> 76\%$) was computed in the abundance data among the studied rivers. Canonical correspondence analysis identified the distance to the adjacent sea, depth, and vegetation as the most important environmental parameters influencing the distribution of fish assemblages. Baseline dataset from this study can be coordinated to concerned entities as a rational basis for future conservation and rehabilitation endeavors of Lake Taal river systems.

Keywords: *Diversity, Freshwater fish, Lake Taal, Pansipit River, Shannons index, Environmental science*

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0230

Domestic Water Quality and Sanitation in Panglao Island, Bohol, Philippines

Caloza, David L., Clemente, Roberto S.

A study on water quality and sanitation is conducted in an urban poor district in Panglao Island, Bohol Province, Philippines. Groundwater is the main domestic water source in the resort Island, where open dug wells and piped-water from deep wells supply the domestic needs of most households. But municipal reports show that from 2000-2003, diarrhea was among the top 10 leading causes of morbidity in the municipality. Household surveys, focused group discussions, infrastructure inspection, and initial field tests showed water quality concerns in the area which include saltwater intrusion and fecal contamination, among others. The aquifer is found to have high level of chlorides (i.e., 990 to 8,550 mg/L and 387 to 8,337 mg/L during wet and dry seasons, respectively) which exceeds WHO threshold value of 250 mg/L. Water sources (wells) in the island are also contaminated in both seasons where 24 out of 26 wells are positive for fecal Coliform. Thus, long term solutions for Panglao Island are necessary to safeguard the health of water users in the island resort. One option is water connection to Bohol mainland and installing a sewerage network with centralized treatment.

Keywords: *Panglao Island, Water Quality, PCA, Sanitation, Salinity, E. coli, Environmental science*

Ecosystem assessment of Cuu Long River Delta Wetland, Vietnam

Thong, Mai Trong, Thu Thuy, Hoang Luu

The Cuu Long river Delta, covering majority of the downstream portion of the Mekong Delta, has four diverse wetland ecosystems in Dong Thap Muoi: coastal, inland, coastal estuarine and special wetland ecosystems. In the past decades, these ecosystems and their services (especially provisioning ecosystem) have been strongly exploited that resulted to its declining ability to meet increasing human demand for natural resources. Based on analysis of trends of change in ecosystems and their services, drivers of change in ecosystems and their services in the Cuu Long River Delta are rapid population growth, economic development pressure and management. Recommendation on management responses at macro-level for the whole region and at micro-level for provinces and environment and natural resource sectors were formulated based on the condition and trend assessment and driver analysis.

Keywords: *Ecosystem, Ecosystem services, Wetland, Cuu Long river Delta, Millennium Ecosystem Assessment, Environmental science*

The effect of particulate matter on visibility in Hangzhou, China

He, Yi, Shi, Yao, Lu, Huijian, Cheng, Wen

Hangzhou, a humid subtropical city of China, was studied to investigate the effect of particulate matters (PMs) and its fractions (e.g., PM_{2.5} and PM_{2.5-10}) and levels of relative humidity (10 to >90%) on atmospheric visibility. It was found that finer fractions of PM have greater negative effect on visibility. This inverse relationship was pronounced during winter season, having the highest PM_{2.5} concentrations and the lowest visual range. Summer season exhibited the highest visual range and least PM_{2.5} fractions, along with autumn. Furthermore, lower relative humidity coincides with higher visual range regardless of the PM fractions. As the levels of relative humidity went up (>90%), lower values of visual range were measured. The results from this study suggest that lower target levels of PM_{2.5} is needed for Hangzhou in order to prevent episodes of poor visibility.

Keywords: *Visibility, Particulate Matter, Humidity, Environmental science*

Effects of larval rearing temperature and host plant condition on the development, survival, and coloration of African armyworm, *Spodoptera exempta* Walker (Lepidoptera: Noctuidae)

Velasco, Luis Rey I. , Aguilon, Dianne Joy D., Medina, Celia dR.

Effects of temperature and host plant condition on insect development have been examined in a number of studies but their combined effect is not well investigated. In this study the effects of varying temperatures and host plant conditions and its interaction on development, survival, and coloration of solitary and gregarious forms of African armyworm (AW), *Spodoptera exempta*, an outbreak pest species, were studied under laboratory condition. Rearing temperature was found to have significant effects on larval and pupal development and pupal weight in both solitary and gregarious forms. The effects of host plant condition in both forms were variable; significant effects were consistently observed in pupal development for both gregarious and solitary forms but not in larval development and pupal weight. Larval and pupal survival of the solitary form significantly decreased with the decreased in temperature, while only pupal survival decreased with the decreased in temperature in gregarious form. Distinct larval coloration was also observed in different temperatures. Larvae reared at high temperature exhibited lighter coloration, while larvae reared at low temperature exhibited darker coloration regardless of rearing density. The significant interaction of temperature and host plant condition on many aspects of insect fitness measured in this study highlights the need for further studies on the effects of other environmental factors such as relative humidity, rainfall, and light intensity to improve predictions as to how these insect pests will respond to climate change.

Keywords: *Spodoptera exempta*, Noctuidae, African armyworm, Rearing temperature, Host plant condition, Environmental science

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Eliciting local ecological knowledge and community perception on fishkill in Taal Lake through participatory approaches

Marquez, Jr., Teodorico L. , Salvacion, Arnold R. , Pabico, Jaderick P. , Reblora, Marlon A. , de la Cruz, Christian Paul P. , Edrial, Jennifer D. , Magcale-Macandog, Damasa, Macandog, Paula Beatrice M. , Perez, Diezza Khey

Aquaculture of tilapia (*Oreochromis* spp.) and bangus or milkfish (*Chanos chanos*) is a predominant activity in Taal Lake since 1975. Participatory Rural Appraisal (PRA) was conducted to collect and synthesize indigenous knowledge and perceptions regarding environmental conditions and fishkills in Taal Lake. Specifically, this study aimed to document anecdotes on land- and lake-use changes through time, commodity shifts and utilization, technological flow, and environmental phenomena. The community's perceptions on probable causes of fishkills were also elicited. Finally, the people's view on the different internal and external factors linked to environmental management as well as their proposed solutions to problems were accounted and analyzed. The major trends and changes in natural resource utilization, urbanization, terrestrial and aquatic livelihood activities, and occurrence of fishkill in the four municipalities in the past seven decades were illustrated using Timeline activity. Increase in human population is the major driver of changes in the natural resources of these municipalities. The local communities in the four municipalities depend on agricultural farming and fish-based activities in Taal Lake for their livelihood. The various factors involved in the occurrence of fishkill in Taal Lake could be categorized into environmental (climatic and volcanic) and anthropogenic factors. Oxygen depletion, volcanic activity, lake overturn, sudden changes in water color, seasonal changes, wind, hydrothermal vents, poor water quality, improper aquaculture practices, and various forms of pollution-generating anthropogenic activities were cited to have influenced the occurrence of fishkills. The devastation brought by fishkill events prompted the community to formulate solutions based on experiences, knowledge of aquaculture industry, and the physical

conditions of the lake. The cage operators, for instance, conduct oxygenation of fish cages when low dissolved oxygen (DO) is observed and during transfer of fish cages to other areas. In addition, efforts towards efficient aquaculture practices such as continuous reduction and systematic arrangement of fish cages in the respective zones, reduced stocking density and feeding rates in fish cages, and proper disposal and management of wastes from domestic, industrial and agricultural (poultry and piggery) sources are the suggested solutions to avoid fishkill. The response of the community to reduce the impact of fishkill is anchored on local ecological knowledge, technology, governance and vigilance.

Keywords: *Fishkill, Indigenous Knowledge, PRA, Taal Lake, Water Pollution, Environmental science*

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0235

Enhanced Pacific Ocean sea surface temperature and its relation to Typhoon Haiyan *Comiso, Josefino C., Perez, Gay Jane P., Stock, Larry V.*

Typhoon Haiyan, which devastated the Visayan Islands in the Philippines on November 8, 2013 was recorded as the strongest typhoon ever-observed using satellite data. Typhoons in the region usually originate from the mid-Pacific region that includes the Warm Pool, which is regarded as the warmest ocean surface region globally. Two study areas were considered: one in the Warm Pool Region and the other in the West Pacific Region near the Philippines. Among the most important factors that affect the strength of a typhoon are sea surface temperature (SST) and water vapor. It is remarkable that in November 2013 the average SST in the Warm Pool Region was the highest observed during the 1981 to 2014 period while that of the West Pacific Region was among the highest as well. Moreover, the increasing trend in SST was around 0.20°C per decade in the warm pool region and even higher at 0.23°C per decade in the West Pacific region. The yearly minimum SST has also been increasing suggesting that the temperature of the ocean mixed layer is also increasing. Further analysis indicated that water vapor, clouds, winds and sea level pressure for the same period did not reveal strong signals associated with the 2013 event. The SST is shown to be well-correlated with wind strength of historically strong typhoons in the country and the observed trends in SST suggest that extremely destructive typhoons like Haiyan are likely to occur in the future.

Keywords: *Typhoon Haiyan, SST, Warm Pool, Environmental science*

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0236

Estimating the recreational benefits of coral restoration in Northwestern, Philippines *Abrina, Tara Alessandra S., Bennett, Jeffrey William*

In this study, the recreational value of restoring corals reefs was estimated in the context of a site in Northwestern Philippines. This study applied the travel cost method with a variation that integrates a contingent behavior question. This allowed for the estimation of marginal benefits in the context of a change in recreational asset quality. The recreational study site, including the reef in its damaged state, gave rise to average per visit benefits of around US\$63.00. With a restored reef, that average value increased to approximately US\$113.00 per visit. Hence, the average marginal benefits associated with an investment in reef restoration for this case study site is in the order of US\$50 per visit, with a 95% confidence interval of US\$0.72 million to US\$3.34 M yr⁻¹.

Keywords: *Travel cost method, Contingent behavior, Coral restoration, Larval enhancement, Environmental science*

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0237

Estimating the recreational value of Taal Volcano protected landscape, Philippines using benefit transfer

Vista, Arvin B., Rosenberger, Randall S.

When protected landscapes serve as popular recreational resources and destinations, then they may hold significant use values for those people that visit them. Recognition of these recreational benefits of protected landscapes provides a sound economic rationale for their management. This study provides estimates of the recreational value via benefit transfer of Taal Volcano Protected Landscape in the Philippines. One study site in the Philippines was selected and used in a point estimate transfer application. Likewise, a meta regression transfer function model was estimated based on selected 'study sites' from the US. Results show that point estimate transfer approach provided a conservative estimate of the recreational value of the site than the international meta-regression benefit function transfer approach. The estimated average welfare estimate of recreational access using point estimate transfer was PhP 26 per person per trip in 2011 and PhP 1,696 per person per trip in 2011 using the meta-regression benefit transfer function.

Keywords: *Access value, Benefit transfer, Consumer surplus, Protected landscape, Recreation, Environmental science*

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0238

Evaluation of anticipated performance index of tree species for air pollution mitigation in Islamabad, Pakistan

Ahmad, Naveed , Nizami, Moazzam , Rizwan, Muhammad , Arshad, Muhammad , Ahmad, Sajjad , Nawaz, Rab , Irshad, Muhammad Atif

There is ever increasing problem of air pollution in cities due to urbanization, industrialization, population growth and increased number of vehicles. Plants can play a vital role in mitigation of air pollution in urban areas. The present study was conducted to estimate the Air Pollution Tolerance Index (APTI) and Anticipated Performance Index (API) for 21 different plant species used for green belt development along the roadsides in Islamabad, the capital city of Pakistan. For APTI and API estimation, ascorbic acid, total chlorophyll content, relative water content and pH of leaf extract of selected plant species were measured using standard methods. The results showed that *Syzygium cumini* L. (jama), *Pterospermum acerifolium* (kanak champa) and *Alstonia scholaris* (devil tree) were the excellent performers. According to API and APTI values, these species were found effective in reducing air pollution and could be effective for green belt development in urban areas. *Albizia lebbek*, *Melia azedarach*, *Eucliptus camaldulensis*, *Dalbergia sissoo*, *Tamarindus indica*, *Acacia nilotica* L., *Callistemon viminalis* and *Leucaena leucocephala* are very poor performers regarding air and noise abatement. These plants are very poor performers and are very sensitive plants to air pollution. These plants can be used as bio-indicators of poor urban air quality.

Keywords: *Environmental management, Ecosystem services, Urban ecosystem, Urban ecology, Biomonitoring, Environmental science*

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0239

Evaluation of social and environmental aspects of Lahore Metro Bus Transit through public opinion

Shahzad, Laila , Zahid, Iqra , Mansoor

Metro Bus Transit (MBT) is highly innovative and advanced transportation technology. Due to rapid urbanization in city Lahore, construction of MBT was considered as top priority technology to balance the demand. The main objective of the study was to evaluate environmental and social impacts of MBT before and after its construction, and the willingness of the people to use it. The study was conducted using a questionnaire during and after the construction of MBT. Face-to-face interviews of 500 hundred respondents who were users, contractors, residents and non-residents along the corridors of MBT were conducted. Mostly, male users were found due to the higher seats availability for them in bus that caused gender inequality. MBT has influenced the livelihood of many people in a positive way such as it created jobs as respondents were expecting. Only lower socio-economic respondents shifted their mode of transportation from own vehicles to MBT. Despite this, the respondents also expressed the need to improve other infrastructures and projects such as electricity supply, education, healthcare facility and other basic needs. Respondents showed high willingness to use MBT rather than conventional public transport and satisfied from its impacts. However, more amendments and improvements should be proposed for enhancing the efficiency of Metro Bus Transit.

Keywords: *Urban transport, Metro bus transit, Comparative assessment, Urbanization, Willingness to use, Environmental science*

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NP

0240

Evaluation of the energy potential of solar radiation in the rural centers of Chaharmahal va Bakhtiari Province, Iran

Beni, Mehran Heydari , Arvin, Abbas Ali

Solar energy plays an effective role in human's life. This study aims to determine the energy potential of solar radiation in Chaharmahal va Bakhtiari Province. The radiation and climate survey data gathered in a daily scale were used to determine the radiation estimate model and find the amount of radiation in Chaharmahal va Bakhtiari Province. The amount of radiation at 13 stations was estimated using experimental models and statistical relationships of radiation with other elements of climate. The reliability of models and the accuracy of the estimated values were confirmed by using the mean bias error and root mean square errors and the correlation between the predicted and observed values. Radiation estimates that used Angstrom models based on the lighting coefficient had more credibility in estimating the amount of radiation in the no-radiometer station. The study of the correlation coefficient between estimated radiation and radiation measurement also showed that in stations which lighting coefficient is used to estimate the amount of radiation, the correlation coefficient was stronger and more meaningful than that of other stations used, based on other climatic parameters such as cloudiness, humidity and temperature.

Keywords: *Chaharmahal va Bakhtiari Province, Solar Radiation, Estimation Model, Lighting Coefficient, Environmental science*

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NP

0241

Examination of relationship between species diversity and environmental variables in arid and semi-arid rangelands of Iran

Vahidi, Mohamad Javad , Memarian, Hadi , Hoseinpour, Maryam , Ghollasimod,

The necessary recommendations for environmental management can be provided by measuring diversity and distribution of plant species. The relationship between species diversity and environmental variables affecting Furg rangelands, in the East of Iran was examined. A systematic-random approach was employed to sample vegetation and soil characteristics. Vegetation sampling was conducted using a 10×10 m quadrat (10 quadrat per vegetation type). According to the rooting depth of plants, soil samples were taken from 0-30 cm depth and analyzed through standard laboratory approaches to determine physical and chemical properties. Species diversity was measured using the indices Simpson, Shannon-Wiener and Fisher's alpha. To determine factors affecting species diversity, the Canonical Corresponding Analysis (CCA) and Principal Component Analysis (PCA) were utilized. The vegetation type Ar.au-Ac.sp (type III) had the highest diversity, which was mainly located on the soils with higher quantities of EC, Ca, Na, Gypsum and sand content. The vegetation type Ar.au-La.or-Co.er (type I) with the lowest diversity was mainly placed on the soils where sand content was higher and soil pH, moisture content, TNV, silt content and slope were lower, as compared with those in other vegetation types. Generally, it could be established that in the studied region, the species diversity of plants was more impacted by soil properties, as compared with topographic characteristics.

Keywords: *Canonical corresponding analysis (CCA), Ordination, Principal component analysis (PCA), Plant species diversity, Soil variable, Topographic factors, Environmental science*

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2017,
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NP

0242

Exploring Spatial Relationship Between Electrical Conductivity and Spectral Salinity Indices in the Mekong Delta

Nguyen, Dung Q. , Trinh, Hoanh P. , Truong, Tuan V. , Pham, Hoa V. , Tran, Duy X. , Tran, Thuong V., Nguyen, Binh A. , Nguyen, Hanh

The negative impact of salinization concurrent with drought is a severe problem that creates challenges for agriculture in deltas and coastal lowlands. This study aims to investigate the spatial relationship among the field measured electrical conductivity (EC) and spectral salinity indices derived from Remote sensed data in the Mekong Delta using Geographically Weighted Regression (GWR). A wide range of Landsat 8 Operational Land Images (OLI) products, including single bands, band ratios, vegetation indices (NDVI and EVI), intensity indices (INT), and brightness indices (BI) were employed for computing salinity indices. The Kriging and Co-kriging interpolation techniques were used to estimate the spatial pattern of the field measured EC. Additionally, the Ordinary Least Square (OLS) regression were employed to characterize the relationship between single bands and EC measurement before applying the GWR for exploring the spatial correlation among the indices. There was a gradually increased of EC value from inland to coastal area. A significant relationship between EC measurement and spectral salinity indices and the highest correlation coefficient with p value less than 0.05 was found in EVI ($r^2 = 0.736$). This study demonstrated that the GWR is germane to analyse the spatial correlation among the

mentioned variables in the study area. Moreover, it also revealed that spectral salinity indices could be an alternative option for EC measurement in monitoring salt water intrusion at coastal areas. **(Author's abstract)**

Keywords: *Geographically Weighted Regression, Salinization, Salinity Index, EC measurement, Ben Tre, Environmental science*

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2020,
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0243

Exploring the Link between Environmental Practices and Financial Performance: An Empirical Study

Trujillo, Victor Manuel Oquendo , Velasquez Ceballos, Hermilson , Valez, Sandra Liliana Palacio , de Paula, Luciano Barcellos

Ongoing environmental deterioration has led governments and other institutions to pay closer attention to pollution problems as pollutant emissions can significantly influence and constrain economic growth. Most countries on the American continent use the ISO 14001 standard and the number of new certifications grows year by year. This work empirically explores the influence of environmental management system based on ISO 14001 certifications upon the financial performance of Colombian companies, 133 ISO 14001 certified and 5,036 non-certified firms. A panel data analysis over three years was the data analysis method. This work studied the financial performance of the companies implementing EMS compared to those that did not in one of the most important Latin American economies (Colombia). It was found that a positive relationship exists between the ISO standard and financial performance measured through the companies' Return on Assets (ROA).

Keywords: *Environmental management, Financial performance, Voluntary practices, ISO 14001 Standard, Environmental science*

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2020,
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NP

0244

Factors constraining the natural regeneration of alibangbang (*Bauhinia malabarica* Roxb.) in Carranglan Watershed, Nueva Ecija, Philippines

Guevarra, Donaver M., Florece, Leonardo M.

Field experiments on insect infestation, rodent predation and seed viability were conducted to determine the causes of natural regeneration failure of *Bauhinia malabarica* Roxb. in Carranglan Watershed. The larva of *Caryedon serratus* (Olivier) infested the pods and seeds of *Bauhinia malabarica* with a mean infestation rate of 78.32 % and 73.23 %, respectively. Other experimental trees recorded a mean infestation rate of 75.00 % on pods and 71.19 % on seeds. Examination conducted in different parts of the watershed obtained a mean infestation rate of 65.00 % and 67.80 % on pods and seeds, respectively. On the other hand, rodents were not eating ripened seeds of the species since no predation was observed. On viability test, only 47.50 % germination was obtained in seeds soaked in tap water for 24 hours. This treatment had the earliest germination period (7.75 days), longest total germination period (52 days) and highest germination value (3.32). Similarly, it recorded the highest root length (5.73 cm), total length (12.34 cm) and seedling vigor index (585.62). On the other hand, seeds alternately soaked in tap water and hot for 30 seconds had the highest germination energy (40.75 %). Therefore, serious infestation on *Bauhinia malabarica* seeds and low viability limits the regeneration of the species in the watershed.

Keywords: *Bauhinia malabarica* Roxb., *Caryedon serratus* (Olivier), Natural regeneration, Watershed, Environmental science

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2014,
(Filipiniana Analytics)
NP

0245

Factors influencing farmers' climate change adaptation in Northern Ghana: Evidence from subsistence farmers in Sissala West, Ghana

Soule, Serge K. G. , Song, Shaoxian , Fagariba, Clifford James

Most African countries are vulnerable to climate change as a result of poverty, weather extremes, and insufficient governmental agricultural support. Using the area of Sissala West District, factors influencing farmers' adaptation to climate change and strategies used to avert climate change impact were determined. A total of 330 small-scale farmers were sampled and their views were determined Using logits regression model, weighted average index, and frequency table. Weighted average index was used to rank opinions of 150 key informants in focus group discussions. Using logits regression model, the study indicated irregular rainfall, high temperature, weather information, and high evaporation as the factors compelling farmers to adapt to climate change. Weighted Average Index used to measure weather extremes revealed that drought and temperature had the highest level of occurrence. Furthermore, climate change adaptation strategies assessed in the study showed that agroforestry practices, drought-resistant crops, and mulching were the most preferred methods. The study concluded that farmers' ability to adapt to climate change can be improved if Environmental Protection Agency and Ministry of Food and Agriculture intensify climate adaptation campaigns, increase access to weather information, and training farmers on adaptable strategies including, but not limited to, alternative sources of livelihood.

Keywords: *Adaptation, Agriculture, Perceived Effects, Strategies, Environmental science*

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2018,
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NP

0246

Farmers' perception on the sustainability of a rubber- based agroforestry system as a climate change adaptation strategy in Agusan Del Sur and North Cotabato, Philippines

Castillo, Arturo SA. , Castillo, Arnold Karl A. , Cabahug, Rowena Esperanza D. , Cosico, Russel Son A. , Furoc-Paelmo, Roselyn, Visco, Roberto G.

This documentation research sought to evaluate the effectiveness of rubber-based agroforestry typologies as a climate change adaptation strategy in the major rubber producing regions in the Philippines, particularly in Agusan del Sur and North Cotabato. It focused on the understanding/perception of the RBAS farmer respondents on climate change and their account of its influence on the production system and their coping mechanisms. Among the farmer respondents, drought (El Niño), typhoon, strong winds, heavy rains/excessive rainfall, flash floods and landslides are among the common evidences of climate change. Generally, most of the adaptation strategies employed is through cultural management practices like minimized usage of inorganic fertilizer and chemical pesticides from Agusan del Sur farmer respondents while some of the farmer respondents in North Cotabato employed organic farming practices to adapt to climate change. For both provinces, farmer respondents particularly identified agroforestry and diversified farming system as an effective adaptation strategy. Results proved the potential of the rubber-based agroforestry system to evolve as a resilient farming practice to adapt to climate change vis-à-vis stable biological and economic productivity, controlled occurrence of pest and diseases and minimized detrimental effects of climate change on the agroforestry farm component as a whole.

Keywords: *Climate change, Resilience, Rubber-based agroforestry, Typology, Environmental science*

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2018,
(Filipiniana Analytics)
NP

0247

Fisherfolks' willingness-to-pay for the conservation of Atulayan Bay Marine Protected Area in Sagñay, Camarines Sur, Philippines

Sobremisana, Marisa J. , Predo, Canesio D. , Florece, Leonardo M. , dela Vega, Joela Mizchelle A.

The Atulayan Bay is one of the established Marine Protected Areas in the Philippines in 1993 by virtue of Municipal Ordinance No. 93-001. Use of illegal fishing method and declining fish catch were the problems identified in the area. This study estimated the value of the benefits in conserving the marine resources in Atulayan Bay Marine Protected Area in Sagñay. The survey was conducted on February-March 2019 with 110 Atulayan and 225 Nato fisherfolks. The willingness to pay of the fisherfolks was estimated using the contingent valuation method. The parametric (logit regression) and non-parametric (turnbull) estimation were used to calculate for their willingness to pay to conserve the Atulayan Bay MPA. The estimated average willingness to pay per month of fisherfolk for the parametric estimation of Atulayan and Nato were PhP* 91 (US\$1.72) and PhP 179 (US\$3.39), respectively, and for the non-parametric estimation, PhP 86 (US\$1.63) for Atulayan and PhP 27 (US\$0.51) for Nato. The significant factors affecting the willingness to pay of Atulayan fisherfolks were income and bid level while for the Nato fisherfolks were age, income and bid level. The estimated willingness to pay values are a useful basis for the possible amount of tax that will be collected monthly from the registered fisherfolks by the municipal office for the conservation of the Atulayan Bay Marine Protected Area.

Keywords: *Willingness to pay, Marine Protected Area, Contingent Valuation Method, Atulayan Bay, Parametric estimation, Non-parametric estimation, Environmental science*

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2019,
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0248

Forest road network design based on multipurpose forestry management in Hyrcanian Forest

Fallah, Asghar , Moghadasi, Parisa

Traditionally, the main focus of forestry management has been based on wood production but more recently it is directed at multifunctional forest management. Multifunctional forestry management includes many considerations such as ecotourism, ecology, economic and social issues of forest dwellers as well as wood production. This study aims to design forest roads using GIS and satellite data of SPOT-HRG in the Darabkha forest based on Multipurpose Forestry. The study used the multi-criteria evaluation method based on fuzzy logic to assess the potential of land area for a road network. Opinions of experts and scholars were used to select four criteria and 18 sub-criteria for road design. Analytical Hierarchy Process (AHP) was used for weighting factors. Layers were combined using a weighted linear combination (WLC) operator and the map of crossing the road potential was identified and zoned. The road was designed using the PEGGER program. Geographic Information System (GIS) and satellite data of SPOT-HRG were effective tools for improving outcomes. Weighted Linear Combination (WLC) Model for combination layers was used in this study and recommended the multi object operation (MOLA) in future studies.

Keywords: *Multipurpose forestry, Road design, Multi-criteria evaluation, AHP, Environmental science*

Frontiers in cultural ecosystem services: toward greater equity and justice in ecosystem services research and practice

Gould, Rachelle K., Bremer, Leah L., Pascua, Pua ala, Meza-Prado, Kelly

Cultural ecosystem services (CES) are associated with diverse and profound values, such as spiritual fulfillment, cultural heritage, and identity-related phenomena. Early ecosystem services research often omitted these deep meanings, but they are increasingly explored in recent studies through a range of disciplinary and epistemological perspectives. In the present article, we distill emerging frontiers of CES research. These frontiers help to characterize varied sources of meaning that are central to the CES ethos. They represent both advances in and opportunities for CES research, especially as related to justice and equity. The frontiers are: broadening definitions and conceptualizations of CES; addressing collective aspects of CES and attending to process; acknowledging that CES are reciprocal, relational, and dynamic; embracing narrative; and better connecting CES to biophysical attributes. We focus on the implications of these frontiers for equity and justice and suggest future research that can help ecosystem services work better address both legacies and current manifestations of injustice.

Keywords: *Human dimensions, Nonmaterial, Natures contributions to people, Pluralism, Relational values, Valuation, Worldviews, Environmental science*

Future adaptability of urban trees due to the effects of climate change: the case of Artvin, Turkey

Karayah, Banu

Global climate change began to affect urban and rural landscape planning decisions. The accurate and efficient use of plants that support urban green infrastructure would play an important role in these decisions. The present study aimed to determine the tolerance of domestic and exotic woody plant species planted in public spaces in Artvin province, Turkey to the effects of climate change. Thus, the tolerance of 59 most prevalent trees and shrubs identified in public spaces and natural fields in 12 sampling areas in Artvin province center, Hopa and Ardanuc district centers were surveyed. Findings of the regression model demonstrated that drought, cold hardiness and precipitation had an impact on the adaptability scores of the plants. The differences between the climate conditions in sample areas had an impact on the future adaptation and tolerance of the plants to climate change. This demonstrated that plant species in urban green areas will be affected not only by the global climate change but also by local climate conditions in the short and long term.

Keywords: *Artvin, Climate change, Planting design, Tolerance, Urban trees, Environmental science*

Genetic diversity and relative abundance of cebu black shama (*Copsychus cebuensis* Steere) in fragmented forests of Cebu Island, Philippines

Espaldon, Maria Victoria O. , Florece, Leonardo M. , de Guia, Anna Pauline O. , Laude, Rita P. , Parilla, Richard B.

This study determined the relative abundance of Cebu black shama (*Copsychus cebuensis* Steere) in selected isolated forest fragments in Cebu Island, Philippines and their genetic diversity based on 619 bp *cytB* gene. Mist nets were used to capture the bird in these forest fragments. Four contour feathers were plucked from the body of the caught birds, before they were released, and were stored in tubes with 70% ethanol before DNA extraction. Fifty-nine black shama (*C. cebuensis*) individuals were encountered from the visited territories. At least 13 black shama individuals were estimated to inhabit one hectare of forest habitat. For the first time, analyses of mitochondrial genes revealed that *C. cebuensis* had a long evolutionary history from an initially large and stable population that went through recent expansion resulting from a recent isolating or bottleneck event as indicated by high haplotype diversity (Hd) and nucleotide diversity (π), i.e. Hd>0.50 and π >0.005, and non-significant values of Tajima's D test, Fu and Li's D*, and Fu's Fs statistics. It is hypothesized that this bottleneck event was habitat fragmentation. Furthermore, phylogenetic analyses of *C. cebuensis* supported its monophyly.

Keywords: *Cebu black shama, Copsychus cebuensis, Genetic diversity, Forest fragmentation, Important bird areas, Environmental science*

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2019,
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NP

Geohazards, tropical cyclones and disaster risk management in the Philippines: adaptation in a changing climate regime

Servando, Nathaniel T. , Yumul, Jr., Graciano P. , Dimalanta, Carla B. , Faustino-Eslava, Decibel V., Cruz, Nathaniel A.

Climate change, involving both natural climate variability and anthropogenic global warming, has been a major worldwide concern, particularly with the publication of the Fourth Assessment Report (AR4) of the Intergovernmental Panel on Climate Change. Considering the archipelagic nature of the Philippines and its being a very minor emitter of greenhouse gases, adaptation to climate change has been the Government's national policy. The importance of expediting these climate change-related adaptation measures was highlighted by a string of geo-meteorological- related disasters, specifically triggered by landslides and floods consequent to Typhoon Parma that hit the country in 2009. We present the geologic conditions that rendered the affected areas, especially in northwestern Luzon, extremely vulnerable to the existent hazards, the meteorological conditions that set off the disaster and the different initiatives that the government and local communities have taken to further prepare the people for possible future disasters. Recognition of the pertinent issues and the extant challenges points to the urgent need for mainstreaming both geo-meteorological related disaster risk management and climate change adaptation measures in the light of changing climate conditions.

Keywords: *Climate change adaptation, Disaster risk management, Geo-meteorological hazards, Tropical cyclone, Luzon, Philippines, Environmental science*

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2013,
(Filipiniana Analytics)
NP

GIS-assisted Carbon Stock Assessment of Loboc-Bilar Mahogany Plantation, Bohol, Philippines

Reyes, Tomas D. Jr.

The study determined the carbon budget of the Loboc-Bilar Mahogany (*Swietenia macrophylla* King.) Plantation in the province of Bohol, Philippines within the months of June to October 2018. The plantation straddles two municipalities, Loboc and Bilar. It is a popular destination for local and international tourists due to its compelling tunnel-like vegetative scenery. Delineation of the plantation boundary was fine-tuned using both image digitization and ground survey. A random sampling method was applied in conjunction with Geographic Information System (GIS) software to spatially distribute sampling plots in the research area. Several carbon pools were assessed, namely: aboveground biomass, necromass or ground biomass, and belowground biomass. Allometric and other mathematical equations were used in the calculation of biomass density, stored carbon and carbon dioxide equivalents. The plantation had 29,428.03 Mg of stored carbon in the biomass distributed over a total land area of 115.21 ha, yielding an estimated stored carbon density of 255.43 Mg ha⁻¹. The monetized value of stored carbon in the whole plantation amounted to US\$486,003.96.

Keywords: *Allometric equation, Carbon budget, Carbon stock, Mahogany plantation, Environmental science*

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2019,
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GIS-based approach to determine suitable settlement areas compatible with the natural environment

Selim, Serdar

This study determined the settlement areas that were suitable for the natural environment in the Seydikemer District in Turkey. Within this context, databases related to the natural environment of the region and existing land uses were created using Unmanned Aerial Vehicle images that were digitized and analysed using geographic information systems. Land cover was classified using Random Forest and Maximum Likelihood Classification methods for remote sensing. The natural environmental properties of the study area were determined based on the resulting classification, and the criteria for the suitability of the settlement areas were defined by the Multi-Criteria Decision Analysis and Analytic Hierarchy Process. Accordingly, eight main criteria and their classes of suitability were analysed and evaluated. Assessment of the natural suitable structure of the area was conducted using weighted overlay analysis. Sixteen percent of the survey area was suitable, while 69.01% was moderately suitable and 14.97% was not suitable for use as a settlement area. Considering that this region is in the process of rapid urbanization, The findings of the study are expected to make a significant contribution to the future settlement and land-use plans of the city.

Keywords: *Land-use planning, Multi-Criteria Decision Analysis (MCDA), Suitable settlement, Unmanned Aerial Vehicle (UAV), Geographic Information System (GIS), Environmental science*

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2020,
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NP

GIS-based assessment of groundwater vulnerability to contamination in Boracay Island using DRASTIC model

Florece, Leonardo M. , Ella, Victor B. , Linan, Efren L.

The study was conducted to assess the vulnerability of groundwater resource to contamination in Boracay Island, Aklan, Philippines, using the DRASTIC model in combination with Quantum Geographic Information System (QGIS). Specifically, the study determined the vulnerability of groundwater resource to pollution contamination by computing its vulnerability index. From this, a groundwater vulnerability map was developed and policy intervention recommendations were formulated targeted to ensure the sustainability of ecotourism industry on the island. Results confirmed the high vulnerability of Boracay Island's groundwater resources to contamination and that unregulated pressures due to tourism development could lead to the further degradation of its groundwater and coastal resources. In terms of spatial extent, the groundwater resources of Boracay Island that were found to be vulnerable to contamination are as follows: approximately 410.28 ha (40.87 %) are moderately vulnerable; 562.37 ha (56.01 %) are highly vulnerable; and 30.95 ha (3.08 %) are considered as very highly vulnerable. The study likewise exhibited the combined use of the DRASTIC model and Quantum GIS as an effective method for groundwater contamination vulnerability assessment. It also demonstrated the effectiveness of the model in developing vulnerability maps and the combined use of the model and QGIS in identifying vulnerable areas to contamination that can aid in policy making, planning and management interventions to attain sustainable ecotourism industry in an island ecosystem. The immediate legislation of local ordinance to construct sewerage system on identified critical areas is recommended to mitigate the deterioration of aquatic resources in Boracay Island in the future.

Keywords: *Environmental science, Groundwater Vulnerability Assessment, Boracay Island, DRASTIC Model, GIS*

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2013,
(Filipiniana Analytics)
NP

Identification and implications of relationships among pollutant emission, economic structure and economic growth in China through multivariate analysis

Niu, Haipeng , He, Li , Zhu, Song , Zhang, Pingdan

The relationship between economic growth and environmental quality is generally considered as linear, N-shaped or inverse-U-shaped curve. However, due to the effects of economic structure on economic growth and pollutant emission, this relationship may not be suitable in China. In this study, multivariate regression modeling was performed to identify relationships among pollutant emission, economic structure and economic growth in China. Estimates obtained from integrated multivariate regression results reveal that local provincial economic growth and pollutant emission demonstrate an inverse-N-shaped relationship that is different from that under the Environmental Kuznets Curve (EKC) hypothesis. Further empirical results also indicate that particularly in China; pollutant emission has a negative effect on economic structure and economic growth; pollutant emission can reduce the positive contribution of economic structure to economic growth; and enforcement of emission reduction policies could stifle economic transformation and maintain sustainable economic growth.

Keywords: *Pollutant emission, Economic structure, Economic growth, Multivariate regression, Inverse-N shape Environmental Kuznets Curve, Environmental science*

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2014,
(Filipiniana Analytics)
NP

Identifying vulnerability indicators of rural and freshwater and sanitation systems climate change and its application in Ho Chi Minh City, Vietnam

Le, Ngo

Rural fresh water and sanitation (RFWS) is one of vulnerable sector in the context of climate change (CC). However, vulnerability to CC of RFWS has not yet been assessed in-depth and hardly considered the integrated approach via index method. This study thus aimed to establish vulnerability indicators to CC of RFWS for a comprehensive assessment. By literature review, factors reflecting exposure, sensitivity, and adaptive capacity to CC of RFWS were sufficiently and systematically determined. Expert consulting method was then applied to complete the indicator set, consisting of 53 indicators. There were 22 variables reflecting the exposure to temperature, precipitation, storm, flood, riverbank landslide, saltwater intrusion, and drought; 12 sensitivity variables related to population, water supply and waste treatment, and environment; and 19 adaptivity variables mainly based on facilities and human capitals. The feasibility of the indicator set was examined in a coastal area in Ho Chi Minh city, Vietnam, where the RFWS is a matter of concern and at high risk of CC impacts. Research findings were expected to be an important basis for assessing and proposing measures to cope with CC of RFWS sector.

Keywords: *Climate change, Rural fresh water and sanitation, Vulnerability, Exposure, Sensitivity, Adaptivity, Environmental science*

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2018,
(Filipiniana Analytics)
NP

Indigenous goby population in Mandulog River System and its conservation by communities in Iligan City, Philippines

Pacardo, Enrique P. , Rebancos, Carmelita M. , de Lara, Ayolani V. , Ocampo, Pablo P. , Vedra, Sonnie A., Briones, Nicomedes D.

Threats of water pollution, unregulated extraction of resources, and sprawling urbanization are some of the common issues of Mandulog River, a home for indigenous freshwater gobies. This study was conducted to assess the status of freshwater gobies and how the resident communities exert conservation efforts to the river and the inhabiting gobies. Standard method of collection of gobies was done. Interviews with semi-structured questionnaires were used to know the conservation measures of the residents. Ten goby species belonging to three families namely, Family Eleotridae (*Belobranchus belobranchus*), *Giuris margaritacea*, and *Oxyeleotris lineolata*, Family Gobiidae (*Awaous melanocephalus*), *Awaous ocellaris*, *Glossogobius celebius*, *Glossogobius giuris*, *Periophthalmus barbarus* and *Sicyopterus lagocephalus*, and Family Rhyacichthyidae (*Rhyacichthys aspro*), can be an alternative source of food and livelihood. They were caught by-catch, while employing some destructive fishing methods like cyanide fishing, electric fishing, and use of fine mesh nets. The awareness of the residents to the adverse impacts of water pollution, unregulated human activities, and destructive fishing had strengthened their conservation measures. A multi-stakeholder management approach is created through concerted proactive conservation measures like protection of the goby population, the river-riparian ecosystems, enhanced scientific information, and the legal intervention of the local government.

Keywords: *Goby population, Indigenous species, Resource conservation, Mandulog River, Environmental science*

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2013,
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Institutional arrangements in mangrove rehabilitation management of Palau Island Protected Landscape and Seascape (PIPLS), Sta. Ana, Cagayan, Philippines

Calicdan, Melanie A., Rebancos, Carmelita M., Baguinon, Nestor T.

Sound and effective mangrove management can be achieved when the institutional stakeholders are well organized under a balanced arrangement. This paper aimed to present the case of Protected Area Management Board (PAMB) of Palau Island Protected Landscape and Seascape (PIPLS) in terms of stakeholder's role, interaction, and efforts to address problems and issues on mangrove management. Key informant interviews (KII's) in 14 institutions using a structured questionnaire were employed. The responses were validated in the field through community interview using unstructured questions. Stakeholder analysis was used to analyze the result of the interview. The interaction is only apparent among some stakeholders as far as mangrove management is concerned. Strong interaction was observed among some stakeholders while others have weak or no interaction. Stakeholders with weak interaction are those who do not have the jurisdiction on the resource while those with no interaction are stakeholders with no defined roles on mangrove management. Strong interaction was observed among stakeholders whose mandate is in line with the protection of the resource and has clear roles. Problems on the enforcement (i.e. lack of manpower and resources, inaccessibility of the administering authority, and overlapping institutional roles) still persist but coordination, consultation, and collaboration are being exercised by PAMB members to prevent further confusion and successfully manage the resource. However, the weak implementation of laws due to humanitarian reasons may hamper the effectiveness of enforcement which eventually affects the successful and sound management of mangroves. Therefore, these problems should be immediately addressed. The functions of the members were only stated during the survey and interview and these shall still be subjected to further analysis to come up with a more organized and systematic development of mangrove management in PIPLS.

Keywords: *Institutional arrangement, Stakeholders analysis, Mangrove rehabilitation, Environmental science*

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2016,
(Filipiniana Analytics)
NP

Issue of Cyanobacteria Blooms in Taihu Lake, China

Fu, Jie

Taihu Lake is an important lake located in the eastern China. As a eutrophic lake, lake-wide cyanobacteria blooms have occurred annually, damaging its natural functions and threatened the safety of drinking water resources. This paper first described the harms of cyanobacteria blooms in Taihu Lake, which are mainly manifested in effect to aquatic organisms, damage on the ecological landscape and threats to human health. The northern and western parts of lake were the most frequent area where cyanobacteria blooms occur, usually between middle June to middle October. The dominant algae during the cyanobacteria blooms were *Microcystis* whose abundance had correlations with water quality (i.e., pH, dissolved oxygen, permanganate index, total nitrogen and phosphorus, etc.) and bacteria quantity. Many factors impact the cyanobacteria blooms including physical, chemical and biological factors, of which high temperature ($>28^{\circ}\text{C}$) and nutrients loads contributed most for the cyanobacteria blooms. Further, the integrated physical (dredging sediments) and ecological methods (phytoremediation) should be utilized to control the cyanobacteria blooms in Taihu Lake.

Keywords: *Cyanobacteria blooms, Taihu Lake, Microcystis, Eutrophication, Environmental science*

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NP

Kapok (*Ceiba pentandra* (L.) Gaertn.) fibers packed in nylon nets as sorbent for diesel oil spill and its *ex-situ* bioremediation

Trinidad, Lorele C. , Abejero, Alma Lorelie DJ., Alcantara, Antonio J. , Flavier, Maxima E.

The effects of oil spill on the ecosystem and human lives are unprecedented. Early response and containment of the oil spill is the best approach in reducing the environmental impacts. This study assessed the diesel oil absorption capacity of *Kapok* fiber packed in Nylon net then tested the ability of a consortium of bacterial species reported to have oil degrading properties. To evaluate the conditions for the application of *ex situ* bioremediation, the hydrocarbon conversion was determined qualitatively by monitoring some possible degradation products with hexadecane as reference. *Kapok* (*Ceiba pentandra* (L.) Gaertn.) fibers packed in Nylon net were found effective in adsorbing diesel oil with a sorption capacity of 15.5 g g⁻¹ fibers. A consortium of *Bacillus megaterium*, *Corynebacterium flavescens*, *Micrococcus luteus* and *Pseudomonas putida* with nutrient amendment (0.15 g N and 0.03 g P gram⁻¹ oil) was used to determine preliminary oil biodegradation. Microbial population was sustained for six weeks and all species were found to contribute in the degradation process. Biosurfactant production was also observed in the seawater media. Gas chromatographic analysis showed some degradation products of the adsorbed diesel oil after one week of treatment. The use of *Kapok* sorbents for Tier 1 and 2 oil spill clean-up and its bioremediation done *ex situ* to degrade the diesel oil hydrocarbons can be an option.

Keywords: *Oil spill, Kapok sorbents, Diesel hydrocarbon degradation, Bioremediation, Environmental science*

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2013,
(Filipiniana Analytics)
NP

Knowledge, attitude and practices of nutrition workers on climate change in Laguna, Batangas and Cavite Provinces, Philippines

Rebancos, Carmelita M. , Talavera, Maria Theresa M., Bustos, Angelina R.

Climate change and malnutrition are two global phenomena that affect millions of population groups. The Philippines is considered one of the most vulnerable countries for extreme natural events and at the same time has a high prevalence of underweight (19.0%) and stunting (28.8%) in 2019 among under five children. The nutritionally vulnerable groups are children, pregnant and lactating women, and elderly. These groups are also greatly affected by climate change-related events then the malnutrition situation is exacerbated. The local nutrition workers are the frontline workers who plan, implement, and monitor nutrition programs. Mainstreaming climate change in the local nutrition planning processes will be facilitated if nutrition workers are knowledgeable. This study aimed to determine the current knowledge, attitudes and practices of nutrition workers and perceptions on how to mainstream climate change in the nutrition sector's local planning system. A survey was conducted among local nutrition workers. Ninety-five percent of nutrition workers were highly knowledgeable, 86% were with high level of attitudes and 50% were exhibiting moderate level of practices related to climate change. The gaps can be narrowed by capacity building and possibly this can lead to mainstreaming climate change in the local nutrition planning process.

Keywords: *Watershed management, Sustainability, Multidimensional, Leverage attributes, Environmental science*

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2020,
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NP

Knowledge, attitudes, and willingness to pay for sewerage and sanitation services: a contingent valuation survey in Metro Manila, Philippines

Palanca-Tan, Rosalina

This study uses contingent valuation to elicit Metro Manila households' willingness to pay (WTP) for improved sewerage and sanitation services that can bring about a reduction in the incidence of waterborne diseases and in the pollution load in Metro Manila waterways. The study yields a mean WTP of PhP 7.13-11.98 (US\$0.17-0.29) m⁻³ of water use, just about a third of the average water price. The limited knowledge and appreciation of households on the contribution of their wastewater to the pollution of waterways and on the appropriate wastewater treatment facilities may have resulted in this low WTP. Thus, an extensive information campaign may be necessary to raise awareness and gain support for wastewater treatment programs.

Keywords: *Domestic wastewater, Sewerage and sanitation, Willingness to pay, Contingent valuation, Water pollution, Waterborne diseases, Environmental science*

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NP

Land cover change in the Silang-Santa Rosa River Subwatershed, Laguna, Philippines

Engay-Gutierrez, Kathreena G.

Patterns of land cover change in the Silang-Santa Rosa River Subwatershed in Laguna province were documented through the conduct of Participatory Rural Appraisal approaches and GIS mapping. Drivers and impacts of land cover change in the upland, mid slope and lowland barangays of the subwatershed are influenced by local socioeconomic (investment and livelihood opportunities, and population increase) and biophysical conditions (fertile soil, abundance of quality groundwater, and suitability of land for conversion). For comparing land use changes, 1993 and 2008 land cover maps were generated from classified satellite images using ArcGIS. Land cover patterns in the subwatershed showed series of spatial changes as follows: perennials to grassland then to built-up in the uplands and farmlands to idle lands then to built-up in the lowlands.

Keywords: *Land cover change, Land cover patterns, Environmental science*

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2015,
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NP

Land cover changes and resource use patterns of selected communities in Phou Phanang National Protected Area, Sangthong District, Vientiane Capital, Lao PDR

Alcantara, Antonio J. , Rebancos, Carmelita M. , Sisongkham, Bouakham, Espaldon, Maria Victoria O.

The study determined the relationship of land cover changes and resource use patterns from 1989-2011 of the selected three villages in the Phou Phanang National Protected Area (PPNPA) located in Sangthong District, Vientiane Capital, Lao PDR. It adopted the concept of co-evolution of the communities and the ecosystem for its framework. It is a process in which human communities with their social-system exert selective pressure on the natural resource base and biodiversity of a given ecosystem and how the resulting changes and alterations within

this ecosystem in turn exerts pressure over the given community in terms of the quality of livelihood. The study had shown the positive relationship between population growth rate and land cover change. The positive population growth rate was attributed more on voluntary resettlement induced by the economic opportunities brought about by the government support to lowland agricultural intensification. This condition contributed to decline of the communities' dependence on forest resources. Without the corresponding technical expertise and budget, the national government failed to regulate resource access in the area resulting to widespread illegal occupation and resource extraction. The result had enumerated six recommendations that may contribute to the development of the management strategies for the conservation of Phou Phanang National Protected Areas.

Keywords: *Land cover, Resource use pattern, Community, Environmental science*

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NP

0266

Landscape transformation in an urbanizing area in Laguna, Philippines: assessing trends and policy implications on the ASEAN integration

Bagarinao, Ricardo T.

Landscape transformation (LT) is increasingly shaping the earth's surfaces. Despite the importance of LT analysis in land use planning and environmental management, there is paucity of information on LT especially in developing countries such as the Philippines. The paper seeks to analyze the trend and policy implications of LT in one of the country's urbanizing landscapes in Luzon by using landscape dynamics as its framework and geographic information system as the analytical tool. Land use-land cover (LULC) maps for the periods 2003, 2005, and 2010 were sourced from NAMRIA and digitized, geoprocessed, and recoded to determine the transformation. Nine LULC classes were identified and subjected to patch analysis to quantify their changes in number, size, and class area proportion within the period of analysis. The landscape was predominantly agriculture in 2003-2005 periods but is highly dominated by built-up area in 2010, potentially reducing agricultural production and increasing inundation. Patch analysis also indicates changes in landscape configuration with reduced mean patch size and increased patch number from 2003 to 2010. These trends necessitate the implementation of a policy that ensures sustainable security of life, food, and property of the local communities to make them competitive during ASEAN integration.

Keywords: *Landscape transformation, Geographic information system, Philippines, Urbanization, ASEAN integration, Environmental science*

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NP

0267

Leaching of dissolved organic carbon and cations and the buffering capacity of litters from forest stands in Southwestern China

Wang, Yunqi, Wang, Yujie, Liu, Nan, Zhao, Zhan

Forest soil can buffer acidification and neutralize acidic airborne pollutants, but for acid rainwater, it makes contact with forest litter in the forest ecosystem first before reaching the soil. However, leachate chemistry of forest litter treated with different acid load rates is rarely studied. A leaching experiment was performed on forest litter from mixed conifer-broadleaf (MCB) and evergreen broadleaf (EB) forests in Jinyun Mountain, Three Gorges area, Southwestern China with simulated acid rain (SAR) of pH=2.7, 3.5 and 4.5. Dissolved organic

carbon (DOC) and cations were exported from MCB and EB when treated with various acid load rates. The rainwater deacidification of forest litter was enhanced by considerable leachate concentrations of DOC, Ca^{2+} and Mg^{2+} . The acid buffering capacity of EB was stronger than MCB with different composition of forest litter. Leaching of cations increased with decreasing pH of SAR. Although more easily decomposed, EB released greater Al^{3+} than MCB, leachate Ca/Al ratios of EB did not reach the critical value of 1.0. Thus, in the study area, EB forest may be a better choice for afforestation and reforestation with better forest litter, showing good buffering capacity, keeping soil from acidification and being a greater nutrient pool for soil under it.

Keywords: *Acid deposition, Forest litter composition, DOC, Cations, Acid buffering, Environmental science*

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NP

0268

Lead biomagnification in a food web of the open waters along Sta. Rosa Subwatershed, Philippines

Rañola, Jr., Roberto F. , Macandog, Damasa M. , Zafaralla, Macrina T. , Tingson, Keshia N.

Contamination of lead in fishes from Laguna de Bay was previously recorded to have the highest concentrations that may pose a hazard to human health. However, no previous study was conducted on its biomagnification. This research is the first exploratory study that examined lead biomagnification in a food web of the lake. Water quality, aquatic communities, trophic levels and lead concentrations were analyzed during the dry and wet seasons. Lead concentrations were analyzed using Atomic Absorption Spectrometry. Levels of lead in the water were 0.05 mg L^{-1} and 0.03 mg L^{-1} for dry and wet seasons, respectively. Lead concentrations increased in phytoplankton with 3.87 and 9.66 mg kg^{-1} lead during wet and dry season, respectively. Furthermore, lead levels increased in zooplankton with 2.92 and 14.31 mg kg^{-1} during wet and dry seasons, respectively. In fishes, the highest lead concentration in dry season was detected in *Hypophthalmichthys nobilis* with 0.38 mg kg^{-1} while the highest during wet season was observed in *Oreochromis niloticus* with 0.67 mg kg^{-1} . Lead biomagnification was observed in this study in the following order: water < phytoplankton < zooplankton. However, this increasing trend did not continue up to fishes.

Keywords: *Lead Biomagnification, Laguna de Bay, Contamination, Environmental science*

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NP

0269

Life cycle assessment of Manila hemp in Catanduanes, Philippines

Pacardo, Enrique P. , Alcantara, Antonio J. , Cortez, Jr., Carlos V., Rebancos, Carmelita M.

Environmental burdens of one ton baled abaca fiber, which is exported as Manila hemp, were determined using life cycle assessment with three phases: plantation establishment and fiber harvesting, fiber trading, and grading and baling of fiber. Abaca fiber was organically produced in Catanduanes. One hectare abaca plantation produced an average of 830 kg fiber with a total mean discarded biomass of 5.7 t . A barangay trader can purchased 712 kg of dry fiber per week while Grading and Baling Establishment (GBE) procured and processed 250 t mo^{-1} . One ton of baled fiber required 1.6 ha plantation with $2,132$ undamaged abaca hills that produced $1,052.6 \text{ kg}$ dry abaca fiber. Harvesting produced about 80.2 t of discarded materials and weeds which used as mulch, however, estimated soil nutrient loss was 0.5 kg N and 0.1 kg P and 5.4 kg K . Trading and baling produced 52.6 kg fiber by-product used for furniture making; more than 5 kg of fiber dust and a total global warming potential of 47.7

kg CO₂ equivalent. The following are recommended to improve farm productivity: a) use of organic fertilizer to replace the nutrient loss; b) improve stripping device to enhance fiber quality; and c) utilize farm waste for soil conservation. Local policy on abaca trading was recommended to increase farmer's share. GBE must provide mechanism to improve environmental work condition and strictly enforce the use of ear plug to avoid hearing loss of workers.

Keywords: *Abaca fiber production, Local fiber trading, Baled abaca fibers, Environmental and social life cycle assessment, Environmental science*

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0270

Mainstreaming climate change adaptation in the BS Agriculture curriculum in selected Commission on Higher Education Centers of Excellence in Agriculture *Coronacion, Violeta N.*

The agriculture sector is one of the major areas much affected by the current climate change risk. The Higher Education Institution (HEIs) specifically the SUCs centers of excellence in agriculture plays significant role to limit or lessen the impacts of climate change by promoting leadership in developing effective climate change adaptation strategies and creating public awareness. This study was conducted to assess the level of integration of climate change adaptation (CCA) in teaching courses under the Bachelor of Science in Agriculture (BSA) curriculum; determine the extent of influence of individual, organizational, external factors in the integration; and develop strategies how to mainstream CCA in the BSA curriculum program. Descriptive research utilizing survey and key informants interview (KII) of the deans and administrators were used to gather necessary data. A total of 103 faculties and 8 college administrators including deans from the four selected university became the respondents. The overall perceived knowledge, student needs to mainstream CCA in BSA is high. Majority of the respondents agreed that climate change adaptation principle is reflected to their organization mission. Minimal level of (CCA) integration observed among the agricultural colleges CHED Centers of Excellence. There is minimum integration of CCA in fundamental agriculture courses offered under BSA curriculum across the participating SUC-CA. Since there are existing legal basis such as; RA 9512 or the National Environmental Awareness and Education Act of 2008, section (3) which focus integration of environmental education in school curricula at all levels, whether public or private. RA 9729 or Climate Change ACT 2010. The respondents of this study from participating SUC-CA centers of excellence in agriculture believed that the specific policy from CHED through a circular memorandum order CMO mandating the SUC's to reexamine the existing BSA curriculum under CMO#14 and develop strategies on how CCA will be integrated /mainstream on the course program is effective approach in support to the result of this study.

Keywords: *Climate change adaptation, Strategies on Mainstreaming CCA, CHED centers of excellence in agriculture, Environmental science*

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NP

Measuring adaptive capacity of farmers to climate change and variability: application of a composite index to an agricultural community in the Philippines

Rapera, Corazon L. , Defiesta. Gay

Farming households in the Philippines are most vulnerable to climate change and variability due to their climate/weather-sensitive livelihood and lack of resources to finance adaptation measures. In order to formulate appropriate programs and policies addressing this vulnerability, it is essential to understand their adaptive capacity. This study analyzed the adaptive capacity to climate change and vulnerability of 520 farming households in Dumangas, a town in central Philippines confronting climate/weather-induced risks. The objectives were: to determine the levels of adaptive capacity of farming households to climate change, analyze the factors that cause the differences in adaptive capacity and find out whether adaptive capacity translates to adaptation. The level of adaptive capacity of each farming household was determined using a composite index based on previous studies. The index included five indicators namely human resources, physical resources, financial resources, information and diversity. Results showed that variations in adaptive capacity were caused by differences in information resources, physical and financial resources. Farming households that scored low in these three indicators had lower adaptive capacity. It was also found out that despite their level of adaptive capacity, households employed measures to adapt to climate change and variability. Households with higher adaptive capacity however employed more adaptation strategies.

Keywords: *Climate change, Adaptive capacity, Index, Environmental science*

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Miniaturized solvent extraction and cleanup method for polycyclic aromatic hydrocarbons in air particulate matter by gas chromatography/mass spectrometry

Muller, Konrad , Kwan, Charita S. , Cayetano, Mylene G. , Tamayo, Everlyn Gayle T.

Polycyclic aromatic hydrocarbons (PAHs) are one of the priority pollutants measured in atmospheric particles due to their potential health risks to exposed individuals. A miniaturized solvent extraction and cleanup method has been developed for the determination of 14 types of PAHs in air particulate matter (APM) collected through the use of a five-stage stainless steel Berner sampler with aluminum foil as substrates. The analytical method employed sonication of the impacted APM in the aluminum foil substrates with dichloromethane, extract purification through silica cleanup in miniaturized glass columns, and analysis of the PAHs by gas chromatography/ mass spectrometry. The performance characteristics of the method such as linearity, range, detection limits and quantification limits, recovery and precision for each of the 14 PAHs were established using procedures suggested by Eurachem and/or the Association of Official Analytical Chemists. The method has direct advantages, i.e., use of minimal volume of solvents, and non-utilization of disposable silica solid phase extraction cartridges, but with performance characteristics that are within acceptable limits—thus resulting in a low-cost, practical, and reliable protocol that can quantify PAHs in APM.

Keywords: *PAHs, Solvent extraction, Sonication, Particulate matter, Environmental science*

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Motives for firms to adopt solid waste management controls: the case of food processing sector in Sri Lanka

Jayasinghe-Mudalige, Udith, Udugama, Men

This study offers an empirical analysis of the economic incentives available for food processing firms in Sri Lanka to adopt environmental controls for solid waste management. A series of in-depth interviews (n=325) were carried out with managers responsible for environmental quality in five types of food processing firms (coconut-based products, essential oils, non-alcoholic beverages, processed fruits and vegetables, and other processed products). Confirmatory Factor Analysis techniques were applied to the data to quantify the effect of six market-based incentives (cost/financial implications, sales, reputation, commercial pressure, human resources and technical efficiency), two regulatory incentives (existing and anticipated government regulations), and the liability incentive on the firm's adoption of solid waste management practices. The level of adoption of environmental practices at the firm level is low -- on average firms adopt only 1.2 compared to the recommended eight different possible practices. Costs of adoption and perceived improvements in technical efficiency are two factors that motivate adoption. Liability laws and anticipated future regulations also matter. The analysis suggests that older and larger firms are more responsive to environmental considerations. Interestingly, export oriented firms do not do better than domestic firms.

Keywords: *Economic incentives, Environmental compliance, Food processing firms, Regulation, Solid waste management, Sri Lanka, Environmental science*

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NP

Opportunities and Challenges to Fisheries Policy in the Philippines Today

Abesamis, Rene A. , Montebon, Roberto D. , Calumpang, Hilconida P. , Bomediano, Mylah R. , Oracion, Enrique G. , Malayang, Ben S. III

A framework on the structure and dynamics of fisheries management is described. It is used to identify four opportunities and two challenges for fisheries policy in the Philippines if it were to rationally harness fisheries as fulcrum for sustainable food and protein security in the country in the next 10-30 years. This is, when climate conditions in the country (and in the world) may reach irreversible changes per some reports. Four specific recommendations on the focusing policies are presented if the Philippines were to achieve a more environmentally-anchored ("greener") management of fisheries: reconciling and balancing public and private sector interests over fisheries; providing incentives for "green investments" on fisheries; ensuring the economic and ecological sustainability of culture fisheries as a pressure-easing complement to capture fisheries, and rationalizing land use to improve the viability of culture fisheries.

Keywords: *Fisheries policy, Food and protein security, Ecosystems approach to fisheries management, Capture-culture fisheries complementation, Green investments, Climate resilience, Environmental science*

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Organics and nitrogen removal from wastewater across a plate of entrapped mixed microbial cells

Hong, Pui-Kwan Andy, Lin, Cheng-Fang, Wu, Chien-Ju, Ng, Kok-Kwang, Liu, Chug-Chun, Yang, Ping-Yi, Hong, Pui-Kwan Andy, Lin, Cheng-Fang, Wu, Chien-Ju, Ng, Kok-Kwang, Liu, Chug-Chun, Yang, Ping

This work investigated the concurrent removal of organics and nitrogen from wastewater as it passed through a slab of immobilized activated sludge of different thickness. Removals of chemical oxygen demand (COD) by 90 % from feed of 300 mg L⁻¹ and of ammonia nitrogen (NH₃-N) by 30 to 50 % from feed of 27 mg L⁻¹ in the synthetic wastewater were achieved. Wastewater exited the entrapped mixed microbial cells (EMMC) bed of 0.01 m in depth after a hydraulic retention time of 8 h through the bed. Increasing the bed thickness by up to 5 folds resulted in no enhancement, indicating aerobic processes ceased within the bed depth. The removal of COD was by aerobic respiration and the removal of nitrogen by oxidation via nitrification, both occurring in the aerobic zone of the EMMC bed near the entrance surface. Denitrification occurred deeper into the anaerobic zone of the bed that removed nitrate, leaving behind <0.75 mg L⁻¹ of nitrate in the emerging effluent. Apparent first-order rate constants were >0.29 /h and >0.045 /h for COD and NH₃-N removal, respectively.

Keywords: Denitrification, Organic and nitrogen removal, Entrapped mixed microbial cells, Nitrification, Environmental science

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NP

Particulate and dissolved forms of N, P and organic C transported from major land uses in the Pagsanjan-Lumban Catchment to Laguna de Bay, Philippines

Oliver, Danielle P., Kookana, Rai S.

The distribution of the particulate and dissolved forms of N, P and Organic C transported from major land uses in an agricultural watershed was determined. Total Kjeldahl N (TKN), total P (TP) and total organic C (TOC) were determined in both unfiltered (total) and filtered (<1.2 µm) samples. The particulate fraction (> 1.2 µm, a conservative estimate) tended to dominate offsite transport of TKN, TP and TOC from agricultural land uses, especially in regions with more intense cropping systems, namely Pagsanjan and Lucban. The average proportions of particulate forms of N and P (PN and PP) were higher at Pagsanjan which is a rice growing area (73% of TKN and 68% of TP) than at Lucban (59 % of TKN and 64 % of TP), which is generally under vegetable production. At Cavinti (a site under coconut production), particulate forms of TKN and TP were dominant while the soluble fraction dominated TOC transport. For the piggery site at Majayjay, particulate forms controlled the movement of TKN and TOC while the soluble form dominated TP transport. A significant, positive relationship was observed between total suspended solids (TSS) and PN and between TSS and POC at all sites. A significant relationship between TSS and TP was only noted at Lucban. Overall, the study showed that despite the conservative estimate (> 1.2 µm colloids only), particulate forms for C, N and P were the dominant fraction from all land uses in these agricultural catchments, except P from the piggeries site. The study suggests that the strategies to minimize or trap the particulate form may help reduce off-site migration of nutrients in the major catchment draining into Laguna de Bay, Philippines.

Keywords: Particulates and dissolve forms, Total N,P,C, Environmental science

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2014,
(Filipiniana Analytics)
NP

Peel wastes of *Ananas comosus* (L.) Merr., *Sandoricum koetjape* Merr., *Citrus nobilis* Lour. as lead and cadmium biosorbent in Manila tap water
Solidum, Judilyn N.

Contaminated water from Manila, Philippines must be remediated. The use of peel wastes from *Ananas comosus* (L.) Merr. (Pineapple), *Sandoricum koetjape* Merr. (Santol) and *Citrus nobilis* Lour. (Dalanghita), as agents in removing heavy metals from water could be cost effective. This study aimed to evaluate the capacity of peels to remove lead and cadmium in contaminated water. Furthermore, it aimed to determine the optimum pH, effect of contact time and the initial concentrations of heavy metals on the bio-sorption in the identified peels. The study was carried out by batch process. Biomass was added to known amounts of metals in solution with adjusted pH. After vacuum filtration, the filtrates were analyzed for residual heavy metal concentration using atomic absorption spectroscopy. Peel bio-sorption was optimum at pH 5. The amount of heavy metals adsorbed increased with time until 120 mins. The percent bio-sorption efficiency decreased with an increase in initial heavy metal concentration. The peels followed the pseudo second order kinetics, and the langmuir isotherm model with the bio-sorption of lead. For cadmium removal, pineapple and santol followed Langmuir isotherm model. For the actual contaminated tap water from Manila, santol showed the highest percent biosorption efficiency for lead and cadmium.

Keywords: *Biosorption, Isotherm models, Kinetics, Manila, Philippines, Peels, Ananas comosus(L.) Merr, Sandoricum koetjape Merr., Citrus nobilis Lour, Environmental science*

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 2013,
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 NP

The perceived benefits of marine protected areas by fishers in Batangas, Philippines
Rebancos, Carmelita M. , Samaniego, Badi R.

The study investigated the perceptions of fishers on the relationships between catch, fish sizes and the attitudes of fishers towards marine protected areas (MPA) along the coasts of selected municipalities of Batangas Province in the Philippines, their benefits, their benefits to fisheries, and the attitudes of local fishers towards MPAs. Data and information from a select group of 209 fisher respondents from the selected MPAs that represented young MPAs (0-5 years since establishment), moderate (10-15 years since establishment) and old MPAs (more than 20 years since establishment). young, moderate and old MPAs. The catches and fish sizes reportedly dropped after MPA establishment at locations with young, moderate and old MPAs. Nevertheless, attitudes of fishers towards MPAs were positive especially at locations with long-established MPAs. Tourism-based livelihoods accounted for the positive attitude of fishers towards MPAs at the young and old MPA sites where tourism was better developed. At least 65% of the respondents from the young MPA and 35% of the respondents from the old MPA sites were engaged in tourism-related activities.

Keywords: *Marine protected areas, Local perception, Environmental science*

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 2019,
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 NP

Perspective of environmental education in Taiwan: current status of implementation

Popuri, Srinivasa R. , Lee, Ching-Hwa , Lee, Cha

Environmental education is becoming an essential subject as the environment changes rapidly with human activities. To protect the environment, several countries implemented environmental education acts. Taiwan is the sixth country in the world that implemented an act for environmental protection and sustainability. This study reports the 20-year journey of development and the pioneer status of environmental education act into practice. The Ministry of Education of Taiwan and Environmental Protection Agency jointly proposed the environmental education programme in 1992 to create awareness on the environment protection and develop knowledge, attitudes, skills and values necessary for improving the environment. The Environmental Protection Agency is responsible for accrediting qualified environmental education institutions to handle environmental education personnel training, curriculum plan and management, provide professional service of environmental education with rich ecology, etc. During 2011 to 2019, 200 students in 17 cities were issued environmental education certificates and became qualified environmental education personnel. The number of environmental education personnel in Taiwan has increased every year after the implementation of the Environmental Education Law. This study also provides suggestions of integrating environmental education into the school curriculum and the establishment of corporate social responsibility towards environmental education.

Keywords: *Environmental Education Act, Taiwan, Integrated curriculum, Environmental Protection Agency, Training, Environmental science*

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(Filipiniana Analytics)
NP

Plant diversity and aboveground carbon stock along altitudinal gradients in Quezon Mountain Range in Southern Mindanao, Philippines

Kim, Dongyeob , Pollisco, Jan Paolo T. , Pampolina, Nelson M. , Gevana, Dixon T., Im, Sangjun

Plant diversity, aboveground biomass, and carbon stock along portions of Quezon Mountain Range were assessed in three elevation gradients, e.g., low (400-799 m a.s.l.), middle (800-1,199 m a.s.l.), and high (1,200-1,600 m a.s.l.) in Southern Mindanao using quadrat sampling technique. A total of 146 plants species were identified including threatened *Shorea contorta*, *Parashorea malaanonan*, *Dillenia philipinensis*, *Alstonia macrophylla*, *Cinammomum mercadoi*, *Palaquium luzoniense*, *Neolitsea vidalii*, *Dacrycarpus elatumi*, and *Dacrycarpus imbricatus*. On the average, low diversity was recorded in all gradients particularly in low and middle elevation ranges where alteration of vegetation cover, and proliferation of bio-invasive *Piper aduncum* were observed. Biomass and carbon stock were largest in high elevation where the inaccessible old growth forest is located compared to a proposed mine site in low and middle elevation that are predominated by grassland, farmlands, disturbed secondary growth forest, and human settlements. Overall, carbon stocks ranged from 33.8 to 192.0 MgC ha⁻¹ suggesting the good potential of the area to mitigate climate change. Sustainable management of biodiversity and carbon stock is needed by apportioning productive and protective zones in the mountain.

Keywords: *Biodiversity, Biomass, Carbon storage, Disturbance, Gradient, Environmental science*

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(Filipiniana Analytics)
NP

Potential of using unmanned aircraft systems for landslide monitoring: the case of Janowiec Landslide in Poland

Wilczynska, Izabela

One of the first visible signs of landslide occurrence is changes in microrelief of the slope. In the classical landslide monitoring procedure to determine the land deformation, direct surveys are used. To get accurate and actual information about the object, the ultrahigh resolution unmanned aerial systems imagery can be applied. A digital surface model can be developed and utilized to create a high-resolution orthophotograph as well as a point cloud, which can be used to develop a digital terrain model. Pictures taken by unmanned aerial vehicles have a ground resolution of a pixel on the level of single centimetres. This type of cartometric material is developed in short time and allows to specify the landslides range and features, and in evaluating the mass movement. Cyclical measurements also allow to determine the resulting deformation although it should be noted that the accuracy of survey depends on the vegetation process. In this study, the methodology of landslide monitoring using unmanned aerial systems as well as comparative analyses to the other techniques such as terrestrial laser scanning or airborne laser scanning, were presented.

Keywords: *Landslide, Erosion processes, Unmanned aerial systems (UAS), Unmanned aerial vehicle (UAV), Airborne laser scanning (ALS), Terrestrial laser scanning (TLS), Environmental science*

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2018,
(Filipiniana Analytics)
NP

The profitability of environmental proactivity in business education institutions: an investigation of university administrators

Delgado-Marquez, Blanca L., Aragon-Correa, J. Alberto , Cordon-Pozo, Eulogio

Over the last decades, the implementation of an environmentally-proactive behavior has taken on a new priority as part of the environmental planning strategies at higher education institutions. Nonetheless, this trend has exerted a heterogeneous impact on business education centres. Moreover, prior studies have found that administrators' efforts play a crucial role to foster a school climate supportive of environmental proactivity. This paper contributes to investigate how and why universities, i.e. organizations not guided primarily by financial profits, decide to undertake an environmentally-proactive behavior. Specifically, we analyse deans' perceptions in relation to the economic advantages that may be derived out of different levels of environmental proactivity of the centres. To that aim, we draw on a sample of 74 deans. Contrary to our original expectations, results reveal that there are no significant differences in deans' perceptions of the economic advantages from their centres' environmental proactivity.

Keywords: *Environmental proactivity, Profitability, Business schools, Administrators, Environmental science*

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2013,
(Filipiniana Analytics)
NP

Psychometric properties of the Turkish version of the environmentally desirable responding scale (EDRS)

Kocak, Funda, Ewert, Alan W.

This study was aimed to test the reliability and validity of the Turkish version of the Environmentally Desirable Responding Scale (EDRS). The EDRS contained 18 items, which were expressed on a 4-point Likert scale. The study group consisted of 221 recreational outdoor sports participants from Ankara, Turkey. The participants included 78 females and 143 males, with a mean age of 23.2 years and a standard deviation of 3.92 years. Principal Axis Factoring (PAF) produced a 3-factor solution with the sub-dimensions self-deception/denial of negatives, image management and self-deception/assertion of positives. Confirmatory factor analysis (CFA) confirmed this 3-factor solution, AGFI=0.87, GFI=0.90, NFI=0.91, CFI=0.96, RMSEA=0.061 SRMR=0.053. Cronbach's Alpha coefficient values for 3 sub-dimensions ranged from 0.74 to 0.87. These suggest that the Turkish version of the questionnaire is a valid and reliable data collection tool for recreational outdoor sports participants.

Keywords: *Environment, Factor analysis, Outdoor sports, Scale, Social desirable, Environmental science*

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2017,
(Filipiniana Analytics)
NP

Publishing environmental assessment and management science: crossing the hurdles

Efroymsen, Rebecca A., Peterson, Mark J.

Benefits accrue to scientists, resource managers, companies, and policymakers when environmental scientists publish in peer-reviewed journals. However, environmental scientists and practitioners face challenges, including the sometimes low value placed on journal articles, institutional vested interests in outcomes, and the changing priorities of employers and project sponsors. Confidentiality agreements can also lead scientists to assume publication is not an option. Case studies may be viewed by potential authors as too routine for peer-reviewed journals. On the basis of 30 years of experience, we suggest that publishing hurdles can be overcome and that environmental scientists have a range of options. The topics of manuscripts can include not only results from case studies and perspectives based on them but also byproducts of assessments, including definitions, plans, monitoring methods and models, and decision frameworks. Environmental scientists have unique opportunities to move science forward with their practical knowledge if they can move across the institutional, logistical, data-related, and content-related hurdles.

Keywords: *Publishing, Environmental science, Assessment, Monitoring, Environmental management, Environmental science*

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2020,
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Removal of acid red 18 (Azo-Dye) from aqueous solution by adsorption onto activated charcoal prepared from almond shell

Hemati, Sara , Rahimi, Rohollah R. , Sadeghi, Mehraban M. , Meghaddam, Fazel Mohammadi , Najafi Chaleshtori, Akram A., Ahmadi, Ali A.

One of the most important environmental pollutants is azo dyes in textile wastewater. In this study, the removal of azo dye Acid Red 18 (AR 18) with initial concentration of 25-100 mg L⁻¹ in aqueous solution by the adsorption process onto activated charcoal prepared from almond shell (AC-AS) was investigated. The effects of initial pH (2-12), contact time (15-120 min), adsorbent (0.2-2 g L⁻¹) and initial concentration of AR 18 (25-100 mg L⁻¹) on the removal efficiency of AR 18 solution were investigated. All experiments were performed on a synthetic wastewater. The efficiency of dye removal and Freundlich and Langmuir adsorption isotherms were compared as a function of decolorization and adsorption and kinetic behavior of AR 18. The maximum removal efficiency of AR 18 (i.e., 90.83%) was occurring with pH 2, contact time of 60 min, initial dye concentration of 75 mg L⁻¹ and the adsorbent dose of 0.8 g L⁻¹. The removal of AR 18 followed the Freundlich isotherm model ($r^2 > 0.994$). Fitting of obtaining data onto kinetic models showed the pseudo second-order reaction kinetics with respect to the dye concentration. This investigation revealed adsorption onto activated charcoal prepared from almond shell presents good efficiency for solution decolorization.

Keywords: *Adsorption, Acid Red 18, Activated charcoal, Kinetic models, Almond shell, Environmental science*

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2017,
(Filipiniana Analytics)
NP

A ridge-to-reef ecosystem-based valuation approach to biodiversity conservation in Layawan Watershed, Misamis Occidental, Philippines

Calderon, Margaret M. , Lasco, Rodel D. , Sajise, Asa Jose U. , Ureta, Julie Carl P.

Ecosystem services commonly valued by the society usually pertains to marketable ecosystem services while non-marketable ecosystem services, such as biodiversity, are usually left unaccounted for, making it less priority and beset with problems such as insufficient funding for conservation activities. Low appreciation on the economic value of these ecosystem services has led to overutilization, causing negative impacts to the environment. This study aimed to estimate the value of a non-marketable ecosystem service, biodiversity, through household's willingness to pay for its conservation activity in Mt. Malindang Range Natural Park (MMRNP) Layawan Watershed. Similarly, a comparison between a "holistic" and "habitat-exclusive" management approaches was done to determine the best management strategy for implementing a sustainable financing mechanism. An average willingness to pay for R2R biodiversity conservation of PhP 43.58 (USD 0.90) per household per month for five years as compared to PhP 33.02 (USD 0.68) per month from an exclusive Upland ecosystem conservation approach and PhP 30.39 (USD 0.62) per month from an exclusive Coastal ecosystem conservation approach. Therefore, a Ridge-to-Reef approach on biodiversity conservation showed significantly higher willingness to pay from households as compared to habitat-based approach. The R2R approach could eventually generate PhP 7.5 M annually.

Keywords: *Valuation, Payments for ecosystem services (PES), Watershed, Willingness to pay, Ridge to reef, Environmental science*

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2016,
(Filipiniana Analytics)
NP

When sacred water becomes an economic good: tensions and governance challenges in Mount Banahaw, Philippines

Hall, Rosalie Arcala , Lizada, Joy C. , Abansi, Corazon L. , Rola, Agnes C. , Dayo, Maria Helen F., Siason, Ida M. L.

Mount Banahaw, an active volcano and a watershed in the municipality of Dolores, Quezon province, Philippines, is also considered a sacred place. This study discussed the community outcomes arising from the conceptual dichotomy of perceptions of multi-use of water by formal organizations such as water districts for domestic use and by informal organizations such as the religious groups for the sacred or religious use of water from the sacred mountain; and the negotiations among these different actors and agents for water access. Results distilled lessons around the interlocking themes of water use and institutions in the access and allocation of water resources as water transits from non-consumptive use to use value. Polycentric water governance is necessary in the context of Mount Banahaw's cultural, social and economic realities.

Keywords: *Sacred water, Use value, Non-consumptive use, Water governance, Mount Banahaw, Philippines, Environmental science*

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2018,
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NP

Seasonal variation on dissolved oxygen, biochemical oxygen demand and chemical oxygen demand in Terengganu River Basin, Malaysia

Umar, Roslan , Sunardi, , Mohd Saudi, Ahmad Shakir , Abd Wahab, Noorjima , Md Bati, Siti Nor Aisyah , Toriman, Mohd Ekhwan , Kamarudin, Mohd Khairu

The rise in human population densities and the pace of development had intensified the depletion of the water quality. This study aimed to analyze the concentration of dissolved oxygen (DO), biochemical oxygen demand (BOD) and chemical oxygen demand (COD) during wet season and dry season at Terengganu River in 2016. A total of 29 monitoring stations in the study area were selected and three water quality parameters were analyzed using descriptive statistics and the correlation matrix methods. The DO ranged from 2.11 to 8.07 mg L⁻¹, COD from 2.24 to 39 mg L⁻¹ and BOD from 0.67 to 6.52 mg L⁻¹ for the wet season while in dry season, DO ranged from 2.30 to 6.05 mg L⁻¹, COD from 1.9 to 20.48 mg L⁻¹ and BOD from 0.04 to 13.99 mg L⁻¹. Spearman's correlation test shows there was a weak correlation between DO and COD during wet season, while in the dry season, there was a weak correlation between DO-COD and DO-BOD. This study also found out that urbanization and anthropogenic activities in the area can give the more impact towards seasons and water quality deterioration in Terengganu River, Malaysia.

Keywords: *Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Correlation Test, Terengganu River, Environmental science*

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2020,
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NP

Social capital and vulnerability to extreme climate in a semi-urban fishing community in Laguna de Bay, Philippines

Palanca-Tan, Rosalina

The study looked into the risks associated with extreme climate events in the case of a semi-urban fishing community surrounding Laguna Lake in the Philippines. A survey was undertaken to determine the economic effects (loss of assets, foregone income, and changes in consumption patterns) of strong typhoons and torrential rains on fishing households. Vulnerability, estimated as the perceived probability of lower consumption after flooding or typhoons, was used to assess the economic impact on households. Household characteristics, including social capital, that may influence consumption vulnerability, were analyzed using a binary probit regression model. Social capital, a multi-dimensional concept consisting of social networks and skills possessed and used by household members to facilitate actions, was modeled using four indicators – two associational (membership in a formal organization and usefulness of informal social networks) and two behavioral (trust and cooperativeness). Regression results revealed that fishing income and household size significantly affect vulnerability. The higher the fish catch and the smaller the household, the less vulnerable is the household to strong storms and torrential rains. Social capital indicators do not significantly affect consumption vulnerability of households.

Keywords: *Extreme climate events, Typhoons, Torrential rains, Vulnerability, Social capital, Environmental science*

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NP

Social Vulnerability and Adaptive Capacity to Climate Change Impacts of Women-headed Households in the Philippines: A Comparative Analysis

Quimbo, Maria Ana T. , Depositario, Dinah Pura T. , Dizon, Josefina T. , Delfino, Ariel N.

This study analyzed the social vulnerability and adaptive capacity to climate change impacts of women-headed households in two remote coastal communities in Lagonoy, Camarines Sur. Quantitative method following descriptive-correlational research design was employed. Out of 281 WHHs, 162 were randomly selected as the respondents of this study. Descriptive statistics, principal component analysis (PCA), t-test for independent samples, and multiple linear regression analysis were used to analyze the data. Women-headed households in the two remote coastal communities have moderate to high vulnerability in terms of demographic, economic, and social factors. No significant difference was found in their level of social vulnerability; however, a substantial difference was found in the adaptive capacity of the respondents from the East and North coastal communities. Multiple linear regression analysis revealed that the number of household members with disabilities, affiliation with social groups, time travel of the respondents, and household size were significant factors influencing social vulnerability in the two remote coastal communities. The study recommends formulating effective climate change policies and responsive strategies that enhance the rights and welfare of these households for equal distribution and access to resources, especially in socio-political structures in the community.

Keywords: *Adaptive capacity, Climate change impacts, Coastal communities, Social vulnerability, Women-headed households, Environmental science*

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2019,
(Filipiniana Analytics)
NP

Socio-economic impacts of climate change support-policies to farming systems in a village in Tuguegarao City, Cagayan, Philippines

Lalican, Nelita M. , Dulin, Jerome L.

This study deals with the farming systems and socio-economic impacts of implemented climate change support-policies to 27 farmer respondents in Barangay Carig Norte, Tuguegarao City. Primary data were gathered through a systematic interview with the respondents using a questionnaire, crafted based on the ultimate goals of the National Climate Change Action Plan. Existing records, assessment and project reports of the local government were also used as basis of the analysis. Based on interviews and secondary data, there was no clear indication that climate change support policies were implemented in accordance with the objectives set by the national government. In addition, there were no concrete climate change support-policies yet implemented but there are initiatives and fragmented efforts, policies and projects that address the issues of droughts and flooding. Examples of the fragmented support projects implemented to address climate change are free use of water pump and provision of fuel allowance during drought. The crop insurance for calamities is yet to be implemented.

Keywords: *Climate change policies, Farming system, Socio-economic impact, Environmental science*

The Journal of Environmental Science and Management, Volume No. 18 Issue No. 1, 61-70
2015,
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NP

Soil phosphate sorption characteristics of selected calcareous soil series of Southern Punjab, Pakistan

Khattak, Sabir Gul , Khan, Asghar Ali , Khan, Muhammad Jamil , Khan, Qudrat Ullah

To estimate the sorption and desorption capacity of some selected calcareous soils Jhatpat, Miani Pacca and Hadhwar from southern Punjab in Pakistan were analyzed. The sorption isotherms of the three soils yielded different curves. The maximum sorption was recorded in the Miani pacca soil series with value of sorption 201.23 mg kg⁻¹ which was followed by the Hadhwar series with peak sorption value of 190.04 mg kg⁻¹. The lowest value for sorption was determined in the Jhatpat soil series. Comparing the different models (Langmuir, Freundlich and Temkin), Freundlich model showed good fit to the sorption isotherms with regression coefficient (R²) having value of 0.99, 0.99 and 0.98 for Jhatpat, Miani pacca and Hadhwar soil series respectively, which was higher than the other two models used. The study on the effect of equilibration time (1, 10, 30 and 60 days) of applied inorganic Phosphatic fertilizers i.e. Single super phosphate (SSP) and diammonium phosphate (DAP) @ 60 and 120 kg ha⁻¹ on two soil series with highest P sorption. The P sorption increased with increase in the time of equilibration, with higher value of extractable P was found 22.246 mg P kg⁻¹ after 1 day of incubation, and it gradually decreased with the lowest value of 8.271 mg kg⁻¹ after 60 days of incubation.

Keywords: *Soil Phosphate, Sorption, Desorption, Langmuir, Freundlich, Temkin, Environmental science*

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2018,
(Filipiniana Analytics)
NP

Solid waste management and reduction of agricultural post-harvest losses using cold-storage: perceptions of farmers in Benguet, Philippines

Malamug, John , Seroje, King Karl , Calora, Jr., Jose Feliciano G. , Espaldon, Maria Victoria O. , Manansala, John Victor H. , Cruz, Maria Lorena , Sanchez, Patricia Ann J., Molintas, Edgar

Vegetable harvest in the Philippines are wasted due to spoilage (~42%) posing a challenge to the country's food security and solid waste management. The study aims to determine current vegetable farming practices and farmer perceptions on the use of cold storage facilities in Benguet Philippines for reducing vegetable waste in the post-handling process system. Specifically, this aims to: identify common high-value crops available and acceptable to farmers for storing in cold storage facilities by developing the actual cropping calendars (planting and harvest schedules) of these high-value crops; quantify waste generated on-farm and during marketing and identify current farmer practices and perceptions on post-harvest handling. Common high value crops for possible cold-storing are green-leafy vegetables since these command high prices when they are available off-season. Waste generated is 7.5% of total produce during harvest while 20-50% is further lost during the marketing. The three main issues of farmers are price, market and the harvesting process. Timely information dissemination on market demands and prevailing vegetable prices, availability and access to storage and cold-storage facilities are necessary to encourage farmers to minimize vegetable waste generated and optimize farmer income.

Keywords: *Waste management, Post-harvest, Cold storage, Benguet, Environmental science*

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(Filipiniana Analytics)
NP

Spectrochemical analysis of tissues of frog *Dryophytes plicatus* tadpoles (Amphibia: Hylidae) developing under lead and iron pollution

Romo-Gomez, Claudia , Aguillan-Gutierrez, David Ramiro, Ramirez-Bautista, Aurelio

This study conducted a bioassay on frog tadpoles of the Mexican endemic species *Dryophytes plicatus* exposed to lead and iron. This species was used because some of its populations live near urban areas that may exposed them to pollutants, such as heavy metals due to industrial processes or mining industry. Specimens in a post-embryonic stage of *Dryophytes plicatus* were collected in water bodies near El Chico National Park. For the bioassay, the collected samples were grouped into three namely; tadpoles in contact with steel cloves (99% Fe, 1% C); the second group in contact with lead plates; and the last was the control group (without heavy metals). A spectrochemical analysis was held to identify the concentrations of these elements in the liver, intestines, and gills. This study shows that *Dryophytes plicatus* can bioaccumulate these heavy metals in their tissues, particularly in the liver and the intestine. The concentration of lead and iron was similar in both the control and experimental groups, due to the use of tap water of a mining place, but the concentration in the tadpoles tissues indicates a bioaccumulation process.

Keywords: *Dryophytes plicatus, Tadpoles, Amphibian, Lead, Iron, Environmental science*

The Journal of Environmental Science and Management, Volume No. 21 Issue No. 1, 74-81
2018,
(Filipiniana Analytics)
NP

Stakeholder analysis of municipal solid waste companies- a first step towards successful corporate social responsibility

Lopez-Toro, Alberto , Suarez-Cebador, Manuel, Rubio-Romero, Juan Carlos , Arjona-Jimenez, Rafael

The rise of the world's population is causing a never-ending increase in Municipal Solid Waste (MSW) generation. This, along with the commitment to necessary protection for the environment, requires companies managing MSW to make effective decisions to maximise satisfaction among their stakeholders. This research aimed to identify the main stakeholders and the relevance of each one. Four focus groups discussions were set up for this identification, involving a total of 36 experts from different sector related disciplines. In order to guarantee reliable results, rank-ordering of alternatives was applied obtaining a high Kendall coefficient of concordance equivalent to 0.83. Subsequently, these were applied to a pairwise comparison grid that gave a stakeholder's ranking: citizens, shareholders, workers, town council, special customers, NGOs, public administrations, media and suppliers. This information offers MSW management companies a perspective that helps to set priorities in their decision-making.

Keywords: *Municipal solid waste, Stakeholders identification, Focus group, Corporate social responsibility, Environmental science*

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NP

Study on the desulfurization performance of N-type and P-type semiconductor pyrolysis char composite catalyst

Li, Yonghui , Ma, Zhenhua , Wang, Yusu , He, Huibin , Lei, Zhang , Xiangling, Sha

Ordos coal pyrolysis product roasted under 750oC was used as desulfurization sorbents to investigate the effect of flue gas desulfurization performance of supported metal catalyst. There were 14 kinds of metal oxides from groups IA, IIA, VIB, VIIB, VIII, IB and IIIB chosen as active components to prepare metal oxide supported catalysts by equivalent volume impregnation method. And the mechanism of pyrolysis was studied. The similarities of desulfurization performance among the same group of metal oxides were related to the structure of their outer electrons. In addition, the influence of transition metal oxides on the desulfurization performance was related to metal oxide semiconductor type. Finally, the influence of the VIII group oxide catalyst of iron (Fe), Cobalt (Co), Nickel (Ni) on the desulfurization performance showed the characteristics of diversity related to their d percentage (%).

Keywords: *Desulfurization, N-Type and P-Type Pyrolysis, Char, Catalysts, Metal oxide, Environmental science*

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2017,
(Filipiniana Analytics)
NP

Sugarcane bioethanol processing plant in the Philippines: energetics and water inventory

Magadia, Bernadette T. , Pacardo, Enrique P. , Flavier, Maxima E. , Espaldon, Maria Victoria O. , Movillon, Jovita L. , Alcantara, Antonio J. , Demafelis, Rex B., Matanguihan, Anna Elaine D.

Biofuels production is intended to address shortage on fuel supply. This study assessed the energetics and water inventory of the Philippine bioethanol production from sugarcane, aiming to provide a definitive value from where studies for economic assessment for this system could pick up. A 30-million-liter-per-year (MLPY) processing facility was designed using local field and factory data, from surveys and immersion reports. Assessment showed that sugarcane bioethanol processing facility with co-generation and wastewater treatment units gains a net energy equivalent to 18.62 MJ L⁻¹ of bioethanol produced, with an energy returned on energy invested ratio of 2.75. The net energy realized from the production compensates the energy expended during the construction of the bioethanol plant within about eight months of operation. Water is being used up at a rate of 2,832.22 L per L of ethanol produced or 133.60 L per MJ or 197,826.09 L per Mg of cane processed, accounting the water used for plantation and the factory. The water inventory in the construction level amounts to 952.64 ML. It is concluded that the production of bioethanol from sugarcane is practical, energy-wise, but its water consumption might make the industry unviable in locations where water is scarce.

Keywords: *Energetics, Energy, Water inventory, Water consumption, Requirement, Bioethanol, Sugarcane, Philippines, Environmental science*

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2020,
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The sustainability status of Lahumoko Watershed Management, North Buton Regency, Southeast Sulawesi, Indonesia

Mukhtar, Kilowasid, Laode Muhammad Harjoni , Sabaruddin

The current management of Lahumoko Watershed is still conventional. Mainly, in agricultural land management, the practices do not use the principles of soil and water conservation. This is not sufficient in supporting people's lives so that the biological, physical, social, economic and institutional dimensions do not support the sustainability of the Lahumoko Watershed. This study aimed to analyze the sustainability and the factors that have multidimensional influence on the sustainability of the Lahumoko Watershed, North Buton Regency, Southeast Sulawesi, Indonesia. The method used was Rapid Appraisal for Watersheds, adopted from Rapid Appraisal for Fisheries using the Multi-Dimensional Scaling technique. The sustainability status of the Lahumoko Watershed management for the physical, economic and institutional dimensions were still less sustainable, while the biological and social dimensions were fairly sustainable. Some leverage attributes contributing to improving the sustainability of watershed management were patterns of agricultural crop cultivation, plant diversity in forest, management of protected organisms, river biota, management of forest cover, soil and water conservation technologies, agricultural infrastructure, runoff, sedimentation, water quality, education level, relationship pattern of the community, conflict status, land dependency, agricultural productivity, access to resources, access to markets, resource management planning and rule comprehensiveness for watershed management.

Keywords: *Watershed management, Sustainability, Multidimensional, Leverage attributes, Environmental science*

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2020,
(Filipiniana Analytics)
NP

Sustainable livelihoods-based assessment of adaptive capacity to climate change: the case of organic and conventional vegetable farmers in La Trinidad, Benguet, Philippines

Coladilla, Jesusita O. , Lasco, Rodel D. , Rebancos, Carmelita M. , Colting-Pulumbarit, Clarice

Climate change adaptation is vital for farmers in developing countries due to the high vulnerability of agricultural livelihoods. Scientific literature proposed that organic farming is a promising adaptation strategy, but micro-level studies are lacking. This study compared the adaptive capacity to climate risks of organic and conventional vegetable farmers in La Trinidad, Benguet in the Philippines. Guided by the Sustainable Livelihoods framework, thirty variables under the five livelihood capitals were used to compute Household Adaptive Capacity Index (HACI). Organic farming households have higher adaptive capacity than the conventional group, and have higher natural, financial, human, and social capital. The higher adaptive capacity of organic farmers was due to farm practices related to organic agriculture such as crop diversification, sustainable land management, and participation in organizations. This indicated that organic farming potentially enhances adaptive capacity of vegetable farming households. Findings support literature on the contribution of organic farming to the resilience of agricultural systems. Increased support toward higher adoption of organic farming in areas with similar context is recommended for adaptive management to climate change.

Keywords: *Adaptive capacity, Climate change, Farmers, Sustainable livelihoods framework, Environmental science*

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2018,
(Filipiniana Analytics)
NP

Threats on the natural stand of Philippine Teak along Verde Island Passage Marine Corridor (VIPMC), Southern Luzon, Philippines

Tadosa, Edwin R. , Briones, Romel U., Manila, Antonio C.

This study documents the threats of the critically endangered *Tectona philippinensis* in the backdrop of the past conservation policies and projects. Twelve 20m x 50m plots were distributed in three altitudinal strata (S1= 50 – 100 m asl, S2= 150 to 200 m asl, and S3= 250 – 300 m asl) using stratified random sampling. Every tree was examined to detect presence of pest and diseases on foliage, stem, buttress and exposed root system. Threats of anomalous weather patterns like intense drought and human disturbances were also recorded. Leaf skeletonizers, shotholes, buttrot, heartrot, rootrot, illegal harvesting, charcoal making, wind damages, and intense dry season are among the most alarming threats of *T. philippinensis*. Germinants and wildlings are most susceptible to wilting during intense drought during dry season. A number of interesting species of arthropods and macrofungi within the stand were also encountered. There are variations on the incidence and infection across altitudinal habitat and across diameter classes. Poles and standards at lower altitudinal habitat (<100 m asl) are the most disturbed and susceptible to the disturbances. Existing conservation and protection policies should be strictly implemented especially in hotspot habitats.

Keywords: *Philippine Teak, Critically endangered, Forest survey, Anthropogenic, Disease infection, Environmental science*

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2017,
(Filipiniana Analytics)
NP

Trace metal deposition on soil and accumulation in plants around a coal power station in Pretoria, South Africa

Scott, Gregory, Olowoyo, Joshua O.

Combustion of coal in power stations is one of the main sources of environmental pollution due to the generation of trace metals. This study investigated levels of trace metals from five different plants and soils around a coal-fired power station in Tshwane, South Africa. Plants and soil samples were collected from different points (10, 500 and 750 m) along different directions (North West, North East, South West and South East) and analyzed for metals contents using Inductive Couple Plasma–Optical Emission Spectrophotometer (ICP-OES). A significant increase in the concentration of trace metals was detected from the stack pointing to the effect of the long stack in depositing more trace metals at a distance of 750 m away from the power station. *Digitaria diagonalis* and *Tagetes minuta* have significantly higher concentrations of trace metals than other plants collected around the area ($p < 0.05$). The soil pH was in the range 5.13 ± 0.11 to 6.01 ± 0.12 . The concentrations for all elements in soil were recorded in the following descending order: $\text{Fe} > \text{Al} > \text{Mg} > \text{Cr} > \text{Zn} > \text{Cu} > \text{Pb} > \text{Ni} > \text{Co}$.

Keywords: Trace metals, Coal-fired plant, Environmental science

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2018,
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NP

The use of GIS to visualize spatial distribution of zooplankton in Teluk Bahang Reservoir, Penang, Malaysia

Chin, Lim Chiew, Rahman, Azimah Abd, Ismail, Azma Hanim

The Teluk Bahang Reservoir is the largest in Penang, Malaysia and supplies drinking water to the inhabitants of the Northwest of Penang Island. A monthly testing of water quality and study of zooplankton species abundance was conducted at four different sampling locations and three different water depths. The water quality parameters measured include water temperature, dissolved oxygen, conductivity, pH, orthophosphate ($\text{PO}_4\text{-P}$), ammonium-nitrogen ($\text{NH}_4\text{-N}$), nitrite-nitrogen ($\text{NO}_2\text{-N}$) and nitrate-nitrogen ($\text{NO}_3\text{-N}$). In this study, multiple techniques in ArcMap software, namely, Inverse Distance Weighted (IDW) and Kernel Density, were used to identify the relationship among water quality parameters and species abundance of zooplankton in the sampling stations. In GIS spatial analysis, high abundance areas or hotspot areas of zooplankton were presented in a visual map. The distribution pattern of zooplankton species and the geographic distribution of water quality parameters were clearly identified based on inspection of the map. The data generated from GIS mapping in this study is important for ecological research, particularly on zooplankton distribution in a drinking water reservoir.

Keywords: Penang, Water quality, Zooplankton, ArcMap, Inverse Distance Weighted, GIS, Environmental science

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2020,
(Filipiniana Analytics)
NP

Utilization of putative enterobacter isolate and substrates for microbial fuel cells

Arboleda, Mark Dondi M.

The current Philippine energy crisis reminds us of the importance of finding alternative energy sources. Microbial fuel cells (MFC) may contribute to the solution. MFCs utilizing marine sediments, rice straw, domestic sewage, and agricultural water have a large potential as an alternative energy source. The objectives of the project were to isolate the biological agent, determine the optimum waste substrates, and to develop a working microbial fuel cell using locally available materials as fuel source. Soil, sediment, and corn stover were collected. An improvised MFC was constructed with two compartments for the anode and cathode sections separated by an agar plug (5% w/v). Each compartment had 750 ml capacities. Several combinations of materials were determined. Triplicates of each material-isolate combination were used to determine voltage, amperage, and Columbic output. Thirty percent fish farm sediments produced the highest voltage and amperage. This treatment was able to produce power for 7 to 25 days after MFC setup. Addition of ammonium sulfate in this setup reduced electrical output. Other treatments also produced power but were not as comparable. This study showed that utilizing wastes as substrate for MFCs is feasible and may have practical use.

Keywords: *Microbial fuel cell, Enterobacter cloacae, Waste utilization, Environmental science*

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NP

Water governance framework in Sta. Cruz River Watershed, Laguna, Philippines

Pintor, Lynlei L., Dizon, Josefina T.

Since food security relies on sustainable water supply, this study developed an irrigation water governance framework in order to achieve an effective water irrigation supply. It was conducted in Pila and Sta. Cruz, Laguna with 176 members of the 26 Irrigation Associations. Spearman Rho correlation was used to analyzed the relationship between water governance variables and availability of water. Hindering factors include insufficient water supply during the dry season, deforestation and quarrying, and the limited funds for rehabilitation of the irrigation canals. Majority of the respondents positively declared that their rice production is enough for their household consumption. However, they occasionally experience rice shortage due to strong typhoon and dam was damage by strong typhoon but there is still food security at the household level since rice is available in the market. There is a positive strong linear association between management of water resources and regulation of irrigation water and availability of water. Regulation of irrigation water and the availability of irrigation water were found to have a strong linear relationship. The IA is at the core of the water governance model since ownership of the irrigation system was already transferred by the NIA to the IA. With these, the study recommended that the political, social, and economic aspects, and administrative systems should be taken into consideration. However, various institutions play a vital role for the IA to address the different factors. Through this, good water governance can be achieved resulting to water security thereby achieving rice security.

Keywords: *Water governance model, Food security, Environmental science*

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2019,
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NP

Water quality and population standpoints as factors influencing the utilization for agricultural purposes of the Great Backa Canal, Serbia

Stojanovic, Vladimir , Dolinaj, Drag

Great Backa Canal (GBC) is part of the canal system that connects two rivers, the Danube and the Tisza. It extends through Vojvodina (northern Serbia) and remains to be insufficiently exploited as an agricultural resource. With the aim of fostering agricultural development and sustainable management, the standpoints of the local population as regards the utilisation of the GBC for irrigation and drainage was analyzed. The presented results were obtained through the one-way analysis of variance (ANOVA) and the post hoc Scheffe's test covering a sample of 500 interviewees from ten settlements. The results of the survey were compared to the results of the GBC water quality as per control points (CP). The quality of the watercourses was determined using the Serbian Water Quality Index (SWQI) method. The results show that the GBC includes sections which are pure and entirely suitable to be used for irrigation and drainage (CP 1, 2, 3 and 5; SWQI >70 in most cases) and a section which is completely degraded and unusable (control point 4, SWQI <37 in most cases). The local population has a positive standpoint when it comes to the functions of irrigation and drainage, which differ depending on their place of residence. The residents of Vrbas stand out for their highly negative standpoints that correspond to the water quality results, which were noted to be extremely bad.

Keywords: *Irrigation and drainage, Population standpoints, Water quality, Great Backa Canal, Environmental science*

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2016,
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NP

A watershed-based water environment eco-compensation mechanism: a case study of Taihu Lake Basin, China

Pan, Hongche , Jia, Junjie , Pang, Yong , Zhao, Qiaohua , Zhou, Jie , Wang, Ji

In 2008, a simple punitive eco-compensation method was implemented in the Taihu pilot region, China. However, due to the use of a flawed formula and weak compensation criterion the payments were considered unsuitable. To improve the scheme, the following issues were considered: determination of compensation criterion; compensation when water quality is acceptable; consideration of reciprocating flow; control of the errors in pollutant fluxes due to the non-synchronization of river flow and water quality data. Two alternative ways to calculate eco-compensation payments were assessed for a case study in 2013: a payment based on the "Water quality exceedance rate (WQER) method" was found to be 172 million CNY (24.9 million USD). This method avoided errors caused by the pollutant flux and considered the situations of reciprocating flow and acceptable water quality; and the "Pollutant treatment cost (PTC) method" was considered suitable for immediate implementation, although the payment was higher at 245 million CNY (35.4 million USD). The determination of compensation criterion using this method had a scientific basis, but it required perfect and reliable monitoring data. If these conditions are met, the method was considered suitable for future implementation.

Keywords: *Eco-compensation payment, Taihu pilot region, Water quality exceedance rate method, Pollutant treatment cost method, Environmental science*

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2020,
(Filipiniana Analytics)
NP

Willingness to pay for conserving Layawan Watershed for domestic water supply in Oroquieta City, Philippines

Alcantara, Antonio J. , Briones, Nicomedes D. , Manlosa, Aisa O., Florece, Leonardo M.

The sustainability of domestic water supply from the Layawan Watershed in Oroquieta City critically depends on past and present conservation activities and the availability of funds from stakeholders such as households, communities, non-government organizations, private entities and government agencies. This study determined the willingness to pay (WTP) particularly of households in Oroquieta City to finance conservation projects in Layawan Watershed to ensure the sustainability of domestic water supply. A household survey of randomly selected 278 respondents was conducted using the dichotomous choice referendum format. The Heckman's two-stage analysis for the parametric estimation of mean WTP yielded the values of PhP 4.00, PhP 6.00 and PhP 7.00 per month for mandatory, voluntary and pooled data sets, respectively. The households are willing to contribute funds for conserving Layawan Watershed as supported by the total WTP of Oroquieta City's population that ranges from PhP 117,845.00 (from lower bound estimate of PhP 2.00) to PhP 471,380.00 (from upper bound estimate of PhP 8.00) in five years, discounted at 6 %.

Keywords: *Watershed conservation, Willingness to pay, Contingent valuation, Mount Malindang Range Natural Park, Environmental science*

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2013,
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NP

FISHERIES

Assessment of mud crab fishery in Panguil Bay

Jumawan, Celestina Q. , Metillo, Ephrime B. , Poli, Juvenry P.

The last assessment of three commercially important mud crab species (*Scylla tranquebarica*, *S. olivacea* and *S. serrata*) in the mangrove dominated Panguil Bay was in 2005; there was already an indication of the stock decline. This study aimed to continue the assessment but focused on production, growth parameters, total mortality, and exploitation rate of the three mud crab species at seven mud crab landing sites from March 2017 to March 2019 following standard fisheries enumeration protocols. Results showed that the total resource production in Panguil Bay decreased from 201.1 MT in 2005 to 103.0 MT in 2017-2019. Growth parameters of the three species for male and female, respectively are as follows: *S. tranquebarica* (L_{∞} = 11.5 cm and 11.7 cm, annual growth coefficient K = 0.6 and 0.6, exploitation rate E of 0.5 and 0.5); *S. olivacea* (L_{∞} = 10.9 cm and 11.4 cm, K = 0.5 and 0.6, E = 0.6 and 0.5); and *S. serrata* (L_{∞} = 12.3 cm and 12.9 cm, K = 0.7 and 0.6, E = 0.6 and 0.6). Total production of mud crabs increased, and the three species are highly exploited, but exploitation rates are already slightly below or above maximum sustainable yield (E_{max}). A total of 1,848 fishers were recorded owning 2,015 boats composed of 1,419 motorized and 596 non-motorized. An inventory showed an increase of 5.36% in the number of motorized boats from the last assessment in 2005. A total of 15 types of gear were recorded, in which the top three include fish corral, crab pot, and gill net. Consequently, this study recommends reducing the present fishing pressure or effort of the three mud crab species, particularly during the spawning season occurring on wet months (July to October), for sustained mud crab fisheries in Panguil Bay.

Keywords: *stock assessment, mudcrab, exploitation rate, Panguil Bay, Fisheries*

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Assessment of processing methods for sandfish (*Holothuria scabra*) in Pangasinan, Palawan, and Davao, Philippines

Obinque, Adoracion V. , Nebres, Vivian T. , Delos Santos, Virginia H. , Ragaza, Rosario J. , Ramos, Charlotte Ann M. , Madrid, Ariel Joshua J. , Montojo , Ulysses M. , Bassig, Rosa A.

The Philippine beche-de-mer is reported to get the lowest prices compared to Indo-Pacific Islands competitors, mainly due to small sizes, inferior end-product quality, and use of low-value species. With this, the traditional methods of processing sandfish (*Holothuria scabra*), a high-value sea cucumber species, were assessed through survey questionnaires ($n > 30$) and documentation. The identified study sites were coastal areas where sandfish production and processing are abundant, namely: Anda and Bolinao, Pangasinan; Palawan; and Davao and Compostela Valley. Processing sea cucumbers into beche-de-mer involves the primary steps of cleaning, boiling, and smoke or sun-drying. Variations were observed in the order and number of doing each primary step, as well as in the specific manner of cleaning (slitting, gutting, brushing), boiling, and smoke or sun-drying. Quality evaluation of the products from these different processing methods is recommended to theorize how to improve the overall status of Philippine beche-de-mer, as well as the updating of these findings.

Keywords: *sea cucumber, beche-de-mer, trepang, balat/balatan, traditional processing, Fisheries*

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Descriptive study of the fisheries registration and licensing system in selected municipalities of Panay Island, Philippines

Serofia, Genna D. , Espectato, Liberty N. , Napata, Ruby P.

This study was conducted to describe the effectiveness of the system of registration and licensing of municipal fishers, fishing vessels, and fishing gears in three coastal municipalities of Panay Island and to identify problems and gaps of its implementation. The study sites include Brgy. Culasi, Roxas City, Capiz; Brgy. Polopina, Concepcion, Iloilo and Brgy. Pinamuk-an, New Washington, Aklan. Primary data were gathered through an interview schedule and key informant interview (KII) and further validated through focus group discussions (FGD). Data collection was done during the period September to December 2008 with 1,171 total number of respondents. With no uniform procedure, process of registration and licensing system of the three study sites varies. Compliance rate for fisherfolk registration, fishing gear and fishing boat licensing is highest in Concepcion compared to New Washington and Roxas City. The case of the municipality of Concepcion has also demonstrated that “one-stop shop” strategy of bringing the registration team to the people can increase fishers’ compliance. Some policy recommendations for the LGUs to improve its fisheries registration and licensing system include the following: determine the carrying capacity of the resource as basis for limiting entry, standardize the registration and licensing procedure, establish a fair basis for license fees, and provide funds for the establishment and maintenance of a databank of fishers and the status of their registration and licensing.

Keywords: *Licensing, Registration, Fisheries management, Fisheries*

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NP

Growth performance of the mangrove red snapper (*Lutjanus argentimaculatus*) in freshwater pond comparing two stocking densities and three feed types

Muyot, Frederick B. , Magistrado, Myleen L. , Muyot, Myla C. , Mutia, Maria Theresa M.

The mangrove red snapper *Lutjanus argentimaculatus* (Forsskål 1775) is a high value, euryhaline marine fish with potential as a species for freshwater aquaculture. This study evaluated the growth and cost efficiency of the species in a freshwater pond in two experiments with three replications: (a) comparing stocking densities: (1) 0.5; (2) 1; and (3) 3 fish $\text{fish}\cdot\text{m}^{-2}$ reared for six months fed three times a day with trash fish to apparent satiation; and (b) comparing feed types: (1) trash fish; (2) moist diet; and (3) formulated dry pellet at a stocking density of 1 $\text{fish}\cdot\text{m}^{-2}$ fed to apparent satiation three times a day for seven months. The stocking density (SD) experiment showed significantly higher weight gain, absolute growth and specific growth rate ($P<0.05$) in 0.5 $\text{fish}\cdot\text{m}^{-2}$ SD (184.9 g; $1.04\text{ g}\cdot\text{day}^{-1}$; $2.50\%/ \text{day}$) than 3 $\text{fish}\cdot\text{m}^{-2}$ SD (172.7 g; $0.96\text{ g}\cdot\text{day}^{-1}$; $2.38\% \cdot \text{day}^{-1}$). No significant difference was detected between 0.5 $\text{fish}\cdot\text{m}^{-2}$ SD and 1 $\text{fish}\cdot\text{m}^{-2}$ nor between 1 $\text{fish}\cdot\text{m}^{-2}$ and 3 $\text{fish}\cdot\text{m}^{-2}$ ($P>0.05$). Survival rate (SR) and feed conversion ratio (FCR) were not statistically different between treatments ($P>0.05$), which ranged from 78% to 92% and 5.0 to 5.9, respectively. Cost analysis showed high net returns for 1 and 3 $\text{fish}\cdot\text{m}^{-2}$ SD but low in 0.5 $\text{fish}\cdot\text{m}^{-2}$ SD. The feeding experiment study showed that feed types significantly affected weight gain, SGR, and SR ($P<0.05$). Snappers fed with trash fish attained significantly higher mean absolute growth (298.2 g) and SGR ($1.81\%/ \text{day}$) than those fed moist feeds (232.8 g and $1.61\%/ \text{day}$, respectively) and formulated feeds (236.1 g and $1.51\%/ \text{day}$, respectively). The survival rate was significantly higher in snappers fed trash fish (93.33%) and dry pellets (94.00%) than fed moist feeds (81.34%). FCR in trash fish, moist and dry pellet treatment was 6.4, 6.3, and 2.7, respectively. Cost analysis showed high net returns for trash fish and formulated pellet fed snappers but low in moist diet feed treatment. Cost-benefit analysis showed the feasibility of mangrove red snapper for freshwater aquaculture at a recommended stocking density of 1 to 3 $\text{fish}\cdot\text{m}^{-2}$ using trash fish, moist diet, or formulated dry pellet.

Keywords: mangrove red snapper, freshwater aquaculture, pond culture, moist diet, formulated dry pellets, Fisheries

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Quality assessment of processed sandfish (*Holothuria scabra*) using papaya leaves to remove its hard spiculy layer

Obinque, Adoracion V., Nebres, Vivian T., Delos Santos, Virginia H., Salem, Gielenny M., Cabigao, Junwell S., Ramos, Charlotte Ann M., Madrid, Ariel Joshua J., Ragaza, Rosario J., Bassig, Rosa A.

The presence of chalky deposits or hard outer covering and extraneous matter are some reasons for product downgrading of dried sandfish, *Holothuria scabra*, locally known as *balat* or *balatan*. Various amounts of fresh papaya leaves, namely, 50, 75, 100, 150, and 200 grams, were used to test its effectiveness in removing the hard spiculy layer on cooked sandfish and assessing its product quality. Results showed that using 75 grams of papaya leaves with 80 minutes of brushing time was found to be effective as 71-85% of the hard spiculy layer was removed. The final products' colors were black to brown, no off-odor or decomposition detected, with a hard texture and completely dried product. The mean water activity (A_w) was 0.787, an amount within the range of 0.80-0.60 for dried foods, and the mean moisture content was 4.31%, which is far below the acceptable limit of 15% for dried sea cucumber. In addition, the dried sandfish had 69.5% protein, 1.42% fat, 1.88% total carbohydrates, and 298 kcal food energy. The study was conducted on a laboratory scale only, and commercialization should be carried out.

Keywords: balat, balatan, sea cucumber, processing, papaya leaves, papain, hard spiculy layer, Fisheries

Reproductive biological performance of *Otolithes ruber* (Bloch and Schneider 1801) in San Miguel Bay, Philippines

Gallego, Errol M., Baltar, Jethro Emmanuel P., Lanzuela, Noemi SB.

The tigertooth croaker, *Otolithes ruber* (Bloch and Schneider 1801), was studied to determine its reproductive biology characteristics for 34 months from March 2015 to November 2017. A total of 7,977 individuals were sampled and the measured total lengths (TL) ranged from 8.1 cm to 32.1 cm (16.70 ± 2.53 cm) and 10.0 cm to 33.5 cm (17.95 ± 2.95 cm) for male and female, respectively. The length-weight relationship can be summarized as $W = 0.00521 L^{3.18}$ and $W = 0.00837 L^{3.01}$ for female and male, respectively. The length at first maturity of this species was determined to be 13.95 cm, which is smaller compared to other studies. The overall sex ratio of this species was 1:0.8, with males dominating the female sex ($P < 0.05$, $X^2 = 64.3$). In addition, synchronized development of male and female gonads was observed. It was also verified that mature individuals were present all throughout the study period indicating that this species spawn continuously and the presence of juveniles during the sampling period indicated continuous recruitment. Mean monthly GSIs indicate July to November as the main spawning season of this species. The in-site occurrence of mature and juvenile stocks in the bay further implicates that San Miguel Bay is a nursery ground for this species. The fecundity varied between 3,420 to 422,100 with an average fecundity of 86,142 eggs. Lastly, the spawning potential ratio is still above the limit reference point (SPR = 0.36), indicating that the stock can still replenish their biomass.

Keywords: *abo, fecundity, gonado-somatic index, sex ratio, spawning season, reproductive biology, San Miguel Bay, Fisheries*

Screening of ciguatoxins in the Philippines by animal assay: symptoms, levels, and distribution in fish tissue

Tanyag, Bryan E., Perelsonia, Karl Bryan S., Cambia, Flordeliza D., Mon, Ulysses M.

The Philippines is an archipelagic country that belongs to the biologically diverse Pacific Coral Triangle, rich in marine resources, including corals, reef fishes, and algae. This explains the continuous sustenance of the Filipinos on fish as a major protein source. Despite their contribution to human consumption, some commercially important coral reef fishes are a threat to food safety, compromising public health. Currently, ciguatera fish poisoning (CFP) has been focused on by scientists since it is the most frequently reported seafood-toxin illness in the world acquired from contaminated coral reef fishes. The present study investigates the contamination of reef fishes in the West Philippine and Sulu Seas using animal assay. Ciguatoxins (CTX) are present in commercially important reef fishes such as barracuda (*Sphyraena barracuda*), parrotfish (*Scarus quoyi*), rabbitfish (*Siganus guttatus*), grouper (*Plectropomus leopardus*), moray eel (*Gymnothorax melanospilos*), and snapper (*Lutjanus campechanus*). *Scarus quoyi* had the highest toxicity of 0.65 ± 0.55 ppb and 0.48 ± 0.36 ppb found in flesh and viscera, respectively. Although higher toxicities were observed from fish viscera, toxicities between fish parts did not vary greatly ($p > 0.05$). Positive samples exceeded the 0.01 ppb guideline established by the US Food and Drug Administration and the Philippines' regulatory limit set by the Bureau of Fisheries and Aquatic Resources. Symptoms of mice showing the presence of Pacific CTX-1 were noted. Since mouse bioassay was used in screening reef fishes that pose non-specificity and insensitivity problems, the researchers suggest that analytical methods must be used in characterizing and quantifying these types of toxins. Establishing the methodologies in detecting CTX would greatly help monitor and manage CFP in commercially identified reef fishes in the country.

Keywords: food safety, ciguatera, toxic reef fish, West Philippine Sea, Sulu Sea, Fisheries

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0315

Single-stream recycling inspires selective fish passage solutions for the connectivity conundrum in aquatic ecosystems

Zielinski, Daniel P., McLaughlin, Robert L., Pratt, Thomas C., Goodwin, R. Andrew, Muir, Andrew M.

Barrier removal is a recognized solution for reversing river fragmentation, but restoring connectivity can have consequences for both desirable and undesirable species, resulting in a connectivity conundrum. Selectively passing desirable taxa while restricting the dispersal of undesirable taxa (selective connectivity) would solve many aspects of the connectivity conundrum. Selective connectivity is a technical challenge of sorting an assortment of things. Multiattribute sorting systems exist in other fields, although none have yet been devised for freely moving organisms within a river. We describe an approach to selective fish passage that integrates ecology and biology with engineering designs modeled after material recycling processes that mirror the stages of fish passage: approach, entry, passage, and fate. A key feature of this concept is the integration of multiple sorting processes each targeting a specific attribute. Leveraging concepts from other sectors to improve river ecosystem function may yield fast, reliable solutions to the connectivity conundrum.

Keywords: Selective connectivity, Connectivity conundrum, Fish passage, Barriers, Invasive fish management, Fisheries

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0316

A study on the distribution and level of cadmium in scallop *Bractechlamys vexillum* (Reeve 1853) from the Visayan Sea, Philippines

Banicod, Riza Jane S., Benitez, Kathlene Cleah D., Tadifa, Gezelle C., Tanyag, Bryan E., Cambia, Flordeliza D., Montojo, Ulysses M., Perelonia, Karl Bryan S.

Bivalves such as scallop *Bractechlamys vexillum* are considered an essential resource for livelihood and revenues in the Visayan Sea, central Philippines. To date, there are several reports that the local marine ecosystems are contaminated with heavy metals like cadmium; hence, these species are also susceptible to bioaccumulation of cadmium because they feed mainly by filtering particles from contaminated water. In recent studies, scallops are suggested to be a potential bioindicator for cadmium contamination due to their ability to accumulate and tolerate the metal. This research aims to examine the anatomical distribution of cadmium in *B. vexillum* and measure the relationship between shell weight and cadmium concentration. The sites for this study include Carles, Iloilo, Madridejos, Cebu, and Cawayan, Masbate. Five organs were analyzed: adductor muscle, digestive gland, gonad, gill, and mantle. The analysis for quantification of cadmium in the different scallop parts was carried out by Inductively Coupled Plasma – Optical Emission Spectrometry (ICP-OES Model ICPE-9820, Shimadzu, Kyoto, Japan). Results showed that cadmium preferentially accumulates in the digestive gland, accounting for 76.39% of the total metal concentration. Moreover, a significant positive correlation ($r = 0.798$, $p < 0.01$) between the cadmium content in the whole digestive gland and shell weight were observed. Thus, this tissue tends to have a potential marker of metal contamination in the environment.

Keywords: cadmium, anatomical distribution, scallop, Visayan Sea, contamination, Fisheries

**Supply and value chain analysis of freshwater sardine, *Sardinella tawilis* (Herre 1927),
in Taal Lake, Batangas, Philippines**

Muyot, Myla C., Balunan, Rielyn L., Mutia, Maria Theresa M.

The supply and value chain of the world's only freshwater sardine, *Sardinella tawilis* endemic to Taal Lake, were studied from January to December 2016. This study aimed to identify the actors in the value chain, evaluate each actor's value addition, identify the roles of men and women in the chain, and identify the issues, concerns, and entry points for intervention. Key informant interviews, focus group discussions, and tracer survey interviews were done to gather data. A semi-structured questionnaire was directed to 189 respondents within and outside Taal Lake. The study showed that the tawilis marketing system is limited to the local market. Tawilis is traded fresh and processed. The chain's key actors include the fishers, fish buyers (wholesaler, retailer, peddlers, and contracted fish buyers), processors, and consumers. The outcome of the value chain analysis of the tawilis industry showed that commercial processors have the highest value-added due to the place, form, and time transformation of the product. Meanwhile, the fishers and small-scale fish buyers have the lowest value-added during lean and peak season, respectively. The tawilis industry provides livelihood to the marginal fisherfolk, which is the first supply chain link. Several strategies were recommended in the form of process, product, function, and overall upgrading to uplift the economic benefit of the different actors in the chain and boost the tawilis industry. These include the improvement on the fishing operations, upgrading of fishing gear and other paraphernalia, provision of training on post-harvest techniques (handling, preservation, processing, value-adding, product development, etc.), market matching strategies, improvement in farm to market road transportation, establishment of fish processing facilities, and access to credit, loans or grants from the national and local governments.

Keywords: *Sardinella tawilis*, value chain analysis, Taal Lake, stakeholders, Fisheries

Value chain analysis of maliputo, *Caranx ignobilis* in the Philippines

Myla C. Muyot, Rielyn L. Balunan, Frederick B. Muyot, Maria Theresa M.

Maliputo (*Caranx ignobilis*) is a high-value food fish in the Philippines with limited studies on market potential. This value chain analysis study was conducted to understand the industry, to identify the key actors, supply and value chain, and to identify issues and concerns to support the development of *C. ignobilis* industry. A survey interview was conducted using purposive sampling in nine *maliputo*-producing regions with 224 respondents, and focus group discussion validated the analyzed data. Key chain actors identified are fishers, fish cage operators, fish buyers categorized as small-scale (local vendors and peddlers) and large-scale intermediaries (commission agents and wholesalers), and processors (restaurants and resorts). Annual production was 188,722 kg valued at PHP 33,752,859.79 with 58.12% coming from capture fisheries and 41.88% from aquaculture. Major producing regions for captured and cultured *C. ignobilis* are Regions 2 (Cagayan), 6 (Iloilo), and 3 (Central Luzon). The industry's value chain map showed a gross value addition of PHP 116.58, 135.65, 75.04, 23.58, and 749.71 per kg *maliputo* for capture, aquaculture, small-scale fish buyer, large-scale fish buyer, and processors, respectively. Processors attained the highest net returns while fishers got the lowest. This study noted that *C. ignobilis* is a non-target species in capture fisheries resulting in an inconsistent supply of the fish. For aquaculture, there is a need to improve its culture technology, develop seed production technology, and formulate an artificial diet. Various

upgrading strategies to improve the industry and to increase the benefits derived by the key actors had been identified and presented in the paper.

Keywords: *Caranx ignobilis, value chain analysis, stakeholders, Fisheries*

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FOOD SCIENCE AND TECHNOLOGY

0319

Characterization of powdered pectin from watermelon (*Citrullus lanatus*) rind *Lo, Melson John C.*

Watermelon rind is considered as a major solid waste in the Philippines due to the high consumption of watermelon pulp. It is said to contain at least 13% of pectin. Pectin is used as a gelling agent for jam and jellies. This study aims to extract pectin from watermelon rind and to characterize the extracted pectin to determine the pectin yield, equivalent weight, methoxyl content, total anhydrouronic acid content and degree of esterification. The watermelon rind was dried using a cabinet dryer @ 50°C for 24hrs before conducting the extraction. The extraction of the pectin was conducted using microwave assisted extraction (pH 2, 700 W, 158 sec). The extracted coagulated pectin was characterized obtaining the following results: pectin yield (.17%), equivalent weight (192.31), methoxyl content (1.18%), total anhydrouronic acid content (15.84%) and degree of esterification (0.42%). Based on the results obtained, it shows that watermelon rind has a low content of pectin.

Keywords: *watermelon rind, microwave assisted extraction, pectin, Food science and technology*

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0320

Development of vitamin A-rich pasta using rice bran flour as partial substitute to wheat flour *Giagonia, Lindsay D.*

Micronutrient deficiencies are a continual lack of nutritional vitamins and minerals and constitute a huge public health problem. Vitamin A deficiency increases vulnerability to a variety of illnesses which includes diarrhea, measles, and respiratory infections where it is common amongst children. In order to address this, great interest in rice bran has led in the discovery of various health benefits. With this, the study aimed to develop a pasta using the rice bran as partial substitute to wheat flour and to determine the Vitamin A content of the rice bran pasta in comparison to commercially available pasta. The rice bran has undergone dry heating method at 130°C for 20 minutes and was formed into dough. The sample pasta was then analyzed for proximate analysis which consists of moisture content, ash, carbohydrates, protein, fat and crude fiber. Vitamin A content analysis was also conducted. Moreover, aerobic plate count, yeast and mold count was observed for microbial activity. It was found out that the rice bran pasta is high in Vitamin A showing a high content of 188 µgRE/100g which is 47% of the recommended dietary allowance compared to the commercially available pasta. Researchers recommend developing a rice bran pasta that should be cut and shaped into different sizes, undergo further tests with different ratios of rice bran flour and can be used for supplementary feedings in the community. From this study, it can be concluded that rice bran is safe for human consumption and can be used as a food supplement.

Keywords: *Food science and technology, substitute, proximate composition, vitamin A content, micronutrient deficiency supplement, rice bran pasta*

**Food availability and access through participatory intervention: Descriptive
Quantitative evidence from Metro Manila**
Gagarin, Mariel M.

Food availability and access is one of the pillars of food security. By evaluating the performance of the National Food Authority in Metro Manila, the study argues that participatory intervention is the key toward an improved food security program. Quantitative data were gathered from poor communities, particularly from 400 respondents living below the poverty line as determined by Department of Social Welfare and Development. Results showed that there is a low level of implementation of the NFA food security program. In particular, the evaluation results of the effectiveness, efficiency, impact and sustainability of the program are low, which respectively revealed the mean results of 1.95, 1.87, 1.94 and 1.91. This evaluation discloses several components of participatory intervention: treatment of poor communities as equal partners; having a flexible policy or program of action for targeting and services; mixing of evaluation, intervention and participation components; and support linkages. The initial findings about participatory intervention critically delineate the fusion between governmentality and state regulation approaches to promote a more effective food security program.

Keywords: *Food security, Rice policy, National Food Authority, State regulation, Governmentality, Non-government actor, Food science and technology*

Macro dimensions of food security in the Philippines
Ebo, Jenny Beb

Time series data of the selected commodities and crops based on the Food Staples Sufficiency Program (FSSP) covering 27 years from 1990 to 2016 were used in the study. In terms of the food availability, accessibility and utilization, there is a negative or a declining pattern showing threats on food security condition of the country. As a whole, however, the food security index measured using the principal component analysis, shows an upward trending pattern condition of food security. This result suggests that the Philippines is food secure taken collectively the interaction of the three dimensions. Empirical results validated the major role of experts in agriculture in sustaining the food security condition of the country.

Keywords: *Availability, Accessibility, Utilization, OLS, Food science and technology*

Perceptions on the extent of *Cocos nucifera* toddy collectors' food safety practices: A basis for integration of food safety in the science curriculum

Antiquando, Nova Marie E.

This study intended to determine the extent of food safety practices as perceived by the *Cocos nucifera* toddy collectors where one hundred forty (140) coconut toddy collectors from the different areas of Guihulngan City serve as respondents. The study is descriptive and correlational in nature and based from the results of the respondents – toddy collectors' responses. The set of questionnaires is based on the Good Manufacturing Practices (GMP) of the Philippine National Standards. Frequency Distribution, Percentage, Weighted Mean, t-test, and Pearson Product-Moment Correlation Coefficient are the statistical tools. The findings reveal that the respondents' average age is 53 years old, and of low literacy. The least experienced of whom have worked in 1-5 years, the rest 17-24 years. The average household size is about 5.5 and most depend on toddy collection for their livelihood. Two groups of respondents are examined as to their hygienic practice perceptions and their actual practices. As the number of work experience increases, the use of the more modern and hygienic metal screw cap was used as lid for toddy containers, the rest used guava (*Psidium guajava*) leaves. Both groups do not essentially differ in their perception on safety practices except the one cited on container lids. Neither does their profile, except that the more experienced used the more hygienic metal screw cap, as cited earlier. In summary, according to the respondents' perceptions, their hygienic practice, in all facets of their toddy collection, is quite high. But if we take into account, their hygienic practices have still a lot to be improved.

Keywords: *Food safety, Cocos nucifera, Toddy collectors, Science curriculum, Food science and technology*

Luz y Saber, Volume No. 13 Issue No. 2, 22-29
2019,
(Filipiniana Analytics)
NP

Utilization of breadfruit (*Artocarpus altilis*) flour into baked products

Lipo, Renie R.

The overall objective of the study is to develop breadfruit (*Artocarpus altilis*) as an additional source of flour in baked products. The matured and unripe breadfruits were washed in clean running water to remove latex and dirt. Then the fruits were peeled manually using a stainless kitchen knife. Peeled fruits are sliced into chips, weighed and blanched for 5 minutes then dried in hot air oven at 100°F for 5-6 hours. The dried chips were grounded using electric grinder. The product was used to bake a pie crust, cookies, and batter cake. Sensory evaluations were conducted as well as cost benefit analysis, with the breadfruit flour yielding favorable results for each. Comparisons with existing products were also done, with the breadfruit flour gaining a slightly higher adjectival rating than existing products. Overall, it is concluded that breadfruit is a good source of flour for baked products.

Keywords: *Breadfruit, Flour, Food, Food science and technology*

Luz y Saber, Volume No. 13 Issue No. 2, 48-54
2019,
(Filipiniana Analytics)
NP

Carbon sequestration by large leaf mahogany (*Swietenia macrophylla* King.) Plantation in Mount Makiling Forest Reserve, Philippines: a decade after

Racelis, Elenita L., Racelis, Diomedes A., Luna, Amelita C.

The study on monitoring carbon accumulation and sequestration potential of Large Leaf Mahogany (*Swietenia macrophylla* King.) plantation in Mount Makiling Forest Reserve was a continuation of the same study conducted in 2000. It aimed to look into the sequestration rate of the plantation after a 10-year period. The study measured the biomass, C and CO₂ stored in the aboveground, ground and belowground biomass. It also quantified the rate of C captured with the 2000 study as baseline data. The latest study showed that the plantation has a total biomass production of 1,120 Mg ha⁻¹ which is equivalent to 542 Mg ha⁻¹ of C and 1,989 Mg ha⁻¹ of CO₂. Within a 10- year period, it registered a biomass buildup of 43 Mg ha⁻¹ yr⁻¹ and sequestered carbon at 22 Mg ha⁻¹ yr⁻¹ and 81 Mg ha⁻¹ yr⁻¹ of CO₂. Its carbon storing capacity surpasses that of an old growth forest, natural stand and other types of vegetation. It can be concluded that the potential of forest plantation to sequester carbon can be maximized given a good-site condition, appropriate silvicultural practices applied, less human disturbances thus allowing the stand to attain its optimum growth as manifested by the plantation studied.

Keywords: Biomass, C, CO₂, Sequestration rate, Forestry

The Journal of Environmental Science and Management, Volume No. 22 Issue No. 1, 67-76
2019,
(Filipiniana Analytics)
NP

Estimation of basic wood density and its uncertainty for *Quercus* species in South Korea

Lee, Young Jin, Lee, Kyeong Hak, Son, Yeong Mo, Lumbres, Roscinto Ian C.

Basic wood density is recommended by the Intergovernmental Panel on Climate Change as one of the parameters that can accurately estimate carbon stocks of trees. This study was conducted to estimate the basic wood density of *Quercus acutissima*, *Quercus mongolica*, *Quercus serrata*, and *Quercus variabilis* in South Korea and to determine their uncertainty. Water displacement method was used to determine the fresh volume of the cubic specimen without bark while the oven-dry weight was determined through oven-drying with a temperature of 85°C until it reached the constant weight. The basic wood density and uncertainty were 0.695 g cm⁻³ and 2.59% for *Q. acutissima*, 0.663 g cm⁻³ and 3.33% for *Q. mongolica*, 0.664 g cm⁻³ and 6.60% for *Q. serrata* and 0.721 g cm⁻³ and 1.66% for *Q. variabilis*, respectively. Analysis of variance showed that there is a significant difference in terms of the basic wood density of the four *Quercus* species (p<0.001). The results of this study on the basic wood density and uncertainty of the different *Quercus* species are essential in providing accurate information for estimating the biomass of *Quercus* forests.

Keywords: *Quercus* species, Basic wood density, Uncertainty, Biomass, Emission factor, Forestry

The Journal of Environmental Science and Management, Volume No. 23 Issue No. 1, 13-18
2020,
(Filipiniana Analytics)
NP

Involvement of women in farm decision-making and adaptive capacity to extreme events of farming households in Ligao City, Albay, Philippines

Pulhin, Florencia B. , Lasco, Rodel D. , Peras, Rose Jane J. , Predo, Canesio D. , Peria, Aileen S. , Nelson, Gloria Luz M. , Pulhin, Juan M. , Tapia, Maricel A., Evangelista, Regine Joy P.

This study examined the involvement of women in agricultural decision-making among farming households in Ligao City, Albay, Philippines and related this to enhancement or decline of their adaptive capacity to extreme weather events. Data were collected through a household survey in the three selected barangays representing coastal, lowland and upland communities. More than 50% of husbands solely made decisions on choice of food crops, cash crops, tree species, and farm production. This parallel findings in the Philippines showing male dominance in agricultural production. Nevertheless, women still participated in decision-making in a limited way as 13-16% of them singly decided on behalf of the household while 30-38% made decisions together with the husband. Following the Sustainable Livelihood Framework, an adaptive capacity index was developed for the households. The analysis revealed that 96.17% of the respondents had low (<0.5) and 3.83% had medium adaptive capacity (>0.5), with all scores ranging from 0.0982 to 0.6171. Age and choice of trees species by husband positively influence adaptive capacity, while choice of cash crops by husband has negative relationship. Farm decision-making is gendered, and giving authority to the person with more capabilities to make effective decisions based on his/her relationship to this resource-based livelihood should be considered despite prevalent notion of the dominance of one gender.

Keywords: *Adaptive capacity, Farm decision-making, Gender, Feminist political ecology, Forestry*

The Journal of Environmental Science and Management, Volume No. 21 Issue No. 2, 70-81
2018,
(Filipiniana Analytics)
NP

GEOLOGY

Assessment of native flora species in relation to soil profile on Mount Kasunogan *Balt, Ben Rashid A.*

Biodiversity is the basis of the state of an ecosystem and our entire planet. This study aims to assess the soil profile's effects on the native flora species on mount Kasunogan. The research was conducted on the west ridge of mount Kasunogan in Barangay Aclan, Nasipit, Agusan del Norte. Flora species of shrubby trees were assessed along with the soil profile on the area. The researchers established three quadrants where leaf and soil samples were taken for assessment. The botanical expedition on mount Kasunogan recorded 37 native flora species. The Malatambis was present on all quadrants, while other species occurred only in one or two quadrants. These flora species have characteristics that allowed them to thrive on the mountain. The soil was determined acidic, and nutrients like potassium, phosphorus, and organic matter mostly ranged from low to moderately low. Planting Falcata, Narra, and Agoho should be considered since these species can withstand intense exposure to sunlight and acidic soil. However, exotic plant plantations must be well studied because there were no exotic plants around in the area.

Keywords: *assessment, Community-based Environment and Natural Resources Office-Nasipit (CENRO), flora, Mount Kasunogan, native flora species, quadrant, soil profile, Philippines, Geology*

SMCC Interdisciplinary Journal, Volume No. 1 Issue No. 1,
2020,
(Filipiniana Analytics)

The Australian experience and a view of the changes from wanton destruction and can't care less to be best practice in mine restoration

Doronila, Augustine I.

The mining industry in Australia as in most of the highly industrialized nations endowed with abundant mineral resources has created a major legacy of land degradation. This has been due to the removal of the previously functional vegetation communities and creating unstable and barren waste materials which also produced heavy metal pollution. Attitudes and practices have evolved and moved on and the industry has recognized the need to formulate various prescriptions, with the overall objective of mine closure to prevent or minimize adverse long-term environmental (physical, social and economic) impacts, and to create a stable landform suitable for some agreed subsequent land use. Mine site rehabilitation is defined as the return of a disturbed site to a form and productivity level that conforms to a defined end land use that may not be necessarily the original use. I will describe a landmark mine closure program to reclaim a highly polluting mining operation and present examples of our work which reflect the changes in mining environmental operations in Australia. In my opinion, because we, as educational institutions in Australia, have produced this large pool of competent students who are aware of environmental stewardship, the educational outputs e.g., skilled students, has also allowed the mining industry to significantly improve its performance. This would be a worthwhile scenario to consider in the Philippine context. In realistic terms, government funding agencies as well as current mining operations must be encouraged to contribute to the upskilling of college and university students by supporting research projects through provision of logistic support to undertake these experiments. We have effectively showed that empirical data generated from these projects are important. Experiments carried out by students under the guidance of competent plant and soil scientists simply provide good evidence of what can and cannot grow on mine wastes. Implementing academic programs of this kind in the Philippines can generate very useful information for the whole industry within a very short span of time (2-3 years) which would allow progressive mine restoration to be undertaken.

Keywords: *mine restoration, bioremediation, mine site rehabilitation, pollution, environmental concern, Geology*

NAST Monograph Series 18, Volume No. Issue No. , 7-18
2012,
(Filipiniana Analytics)

Impacts of human activities on archeological sites in Southern Egypt using remote sensing and field data

Abdelkareem, Mohamed , Moubark, Karem , Abdalla,

The famous archaeological sites of Egypt are potentially affected due to human activities that constitute the main threats through rising of groundwater level as a result of seepage of drainage and sewage water, despite of the arid and hyper arid conditions. This area witnessed several changes during the last four decades, particularly loss of agricultural/arable lands to residential and commercial development. The characterization and evolution of human activities were examined and discussed based on spatial and temporal analysis and interpretation of remote sensing data and field survey. Multi-temporal analysis using Principal Component Analysis (PCA), classification and Normalized difference vegetation index (NDVI) techniques were applied to a series of satellite images. Increasing population and the lack of reticulated wastewater systems allowed recharging and pollution of groundwater in the study area. Results of the chemical analysis of the collected groundwater samples indicate that sodium chloride and sodium sulphate are the two most common destructive salts in the groundwater. Such salts were observed in the deteriorated monuments of the studied temples and foundations. The dewatering processes help in preserving the monuments from deterioration by reducing the groundwater level from 73 to 71.30 and from 73 to about 71 at Karnak and Luxor temples, respectively.

Keywords: *Groundwater, Multi-temporal analysis, Archaeological site, Deterioration, Remote sensing, Dewatering, Egypt, Geology*

HEALTH AND WELLNESS

0331

Barriers and facilitators of treatment-seeking: case studies of Filipino active duty soldiers diagnose with combat-related PTSD

Fajarito, Cariñez Dela Cruz, De Guzman, Rosalito G.

Military personnel face mental health challenges as they are continually deployed, and oftentimes engage in actual combats. One mental health diagnosis identified from soldiers, posttraumatic stress disorder (PTSD), has escalated along with their deployment. But albeit many soldiers suffer from mental health problems, only few seek treatment. This is disturbing, because acquiring treatment is necessary for a healthy and effective workforce. To this end, studies investigated barriers and facilitators of mental health treatment seeking, but those studies had limitations. Using a case study design, this study aims to investigate on the mental health treatment-seeking barriers and facilitators of three Filipino active duty soldiers diagnosed with combat-related PTSD. It employed data triangulation of multiple data sources from all the interviews with the participants, participants' significant others, attending nurses, and resident psychiatrist. Findings reveal two mental health treatment-seeking barriers of the participants: (a) belief about health care personnel and (b) stigma. Meanwhile, the participants' mental health treatment-seeking facilitators are as follows: (a) recognition of PTSD symptoms' severity, (b) desire to regain former self, and (c) social support. Discussion on these findings and implications for practice are provided.

Keywords: *Mental health treatment-seeking barrier, Mental health treatment-seeking facilitator, Mental health care, Military personnel, Soldiers, Combat-related PTSD, Health and wellness*

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2017,
(Filipiniana Analytics)
NP

HYDROLOGY

0332

Strategies for managing household water demand in Carcar City, Cebu, Philippines

Bargayo, Serge Jude B.

This study aims to analyze water demand among households in Carcar City, an urban city in southern Cebu that experienced an unparalleled population and economic growth after its cityhood in 2007. This situation put pressure on the Carcar Water District (CWD), the major water provider in the city, to expand its service capacity. Policy implications for water demand management are drawn from the findings of this study. Hard and soft mechanisms that can be jointly undertaken by the water district and the local government unit are recommended to better manage water demand in Carcar City.

Keywords: *household water, water demand, water demand management, Carcar City, Cebu, governance, Hydrology*

Philippine Journal of Development, Volume No. 45 Issue No. 1,
2018,
(Filipiniana Analytics)

Survival Analysis of Export Relationships of Philippine MSMEs*Bautista, Mark Edison Q.*

This study examines the survivability of Philippine micro, small, and medium enterprises' (MSMEs) exports to select countries within the frameworks of the Asia-Pacific Economic Cooperation Boracay Action Agenda to Globalize MSMEs and the Association of Southeast Asian Nations Strategic Action Plan for SME Development. It documents the survival rate and duration of Philippine exported goods and shows that most export relationships of the Philippines are brief. It also finds that MSMEs, on average, account for a more significant number of the Philippines' export relations than large establishments.

Keywords: *MSMEs, export, micro, small, and medium enterprises, survival analysis, Asia-Pacific Economic Cooperation Boracay Action Agenda to Globalize MSMEs, Association of Southeast Asian Nations Strategic Action Plan for SME Development, Industry, trade and industry*

Philippine Journal of Development, Volume No. 45 Issue No. 1,
2018,
(Filipiniana Analytics)

Computerized medical record and monitoring system of Saint Michael College of Caraga, Philippines*Bergado, Trisha Mae G.*

Life in the digital age raises the need for computerized medical records. This study was conducted to determine the advantages that the system brings to the school clinic and ease managing the students' medical records and personnel of Saint Michael College of Caraga (SMCC). The current CPD framework, while superior to paper in general, frequently doesn't address the client's issues halfway because they depend on an obsolete paper-outline' worldview (Gad & Ramadan, 2013). The study revealed that the system was necessary for managing the medical records and that it is very beneficial for the school. In addition, this system stores files with security and adds information to both students and personnel, including their consultation with the clinic. Moreover, the system updates the information whenever there are changes in the patient - fast-tracking data that can be convenient for the clinic attendant. The system also prints three classes of reports that are easy to manipulate. It was recommended that applying the system to the school clinic to boost the performance in managing the medical records, and improve the security standards, maintain privacy and confidentiality of patient data.

Keywords: *system, computerized, electronic, health, medical record, monitoring, Philippines, Information and Communications Technology*

SMCC Interdisciplinary Journal, Volume No. 1 Issue No. 1,
2020,
(Filipiniana Analytics)

Cyberlearning: the learning management system and the influence of its usage on student engagement

Mandap, Marco C.

With the integration of the Internet into the teaching system, education today has rapidly evolved into cyber learning. Consequently, several educational institutions have adopted learning management systems (LMS), a comprehensive digital platform, to facilitate online instruction. The present study seeks to measure extent of the influence of LMS usage on student engagement.

Keywords: *digital platform, learning management systems, student engagement, e-learning, cyberlearning, Information and Communications Technology*

Enderun Colleges Scholarly Review, Volume No. 3 Issue No. 2,
2020,
(Filipiniana Analytics)

Internet-based car collision verification system for car insurance companies

Guinto, Mary Grace C.

The study has focused in the development of a product that could help the insurance company to verify if their policyholder has encountered an accident or collision. When the car owner encounters an accident or collision it will notify the insurance company via web by sending the pictures of collision and the details of the vehicle, this serves a supporting tool for the insurance policy holder whenever they encountered an accident or collision. The method used for the development of the project is the agile development method. Agile development method attempts to develop a system incrementally, it emphasizes continuous feedback. The hardware materials that were used in this project are the single board which is the raspberry pi, collision sensors that detects the collision, cameras that captures the images when there is an impact detected. The raspberry pi will send the information such as the location of the accident or collision using the GPS, vehicle's plate number and the owner's name via web. A text message will be received by the policyholder when the information is received in the insurance company's web site. And the insurance company can manage the status of the policyholder's claim.

Keywords: *Insurance, Raspberry pi, Sensors, Information and Communications Technology*

Luz y Saber, Volume No. 13 Issue No. 1, 55-60
2019,
(Filipiniana Analytics)
NP

SMS based election software

Bermundo, Cesar , Abanto, Rusty

This study aims to find a solution to the perennial problem of inefficient and costly conduct of elections in the Philippines. It proposes the use of the SMS-Based Election software run by a computer program linked to a designated server, computers, and cell phones. It is assumed that the use of this program will significantly reduce the time to conduct and determine the results of elections. In addition, it will reduce the cost of the conduct of elections and this will mean savings for the government. The program was pilot tested in a school election. Using triangulation, the results were generated less than an hour after the voting and were found to be 100% accurate. A focused group discussion with the student voters later confirmed that the results matched the names of the

candidates for whom they actually voted. The research concluded therefore that the program is not only efficient, but also 100% accurate.

Keywords: *SMS, Software, Server, Parsing, Validity, Information and Communications Technology*

Luz y Saber, Volume No. 13 Issue No. 1, 16-20
2019,
(Filipiniana Analytics)
NP

MATHEMATICS

0338

Insights from early mathematical models of 2019-nCoV acute respiratory disease (COVID-19) dynamics

Rabajante, Jomar F.

In December 2019, a novel coronavirus (SARS-CoV-2) has been identified to cause acute respiratory disease in humans. An outbreak of this disease has been reported in mainland China with the city of Wuhan as the recognized epicenter. The disease has also been exported to other countries, including the Philippines, but the level of spread is still under control (as of 08 February 2020). To describe and predict the dynamics of the disease, several preliminary mathematical models are formulated by various international study groups. Here, the insights that can be drawn from these models are discussed, especially as inputs for designing strategies to control the epidemics. Proposed model-based strategies on how to prevent the spread of the disease in local setting, such as during social gatherings, are also presented. The model shows that the exposure time is a significant factor in spreading the disease. As crowd density increases, the higher the chance an infected person could infect other people. The attendees of the social gathering should have effective protection or preventive measures (e.g., administrative and engineering controls) to minimize further disease transmission.

Keywords: *Coronavirus, Wuhan, Infectious diseases, Mathematical modeling, Huge crowd, Mathematics*

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2020,
(Filipiniana Analytics)
NP

MEDICINE

0339

Accuracy of endometrial 2D ultrasound and power doppler in predicting endometrial pathology among patients with endometrial disease at Dr. Jose Fabella Memorial Hospital

Coloma, Leilani C. , Olalia, Madelynne P.

Transvaginal sonography with Doppler study has helped improve the clinician's ability to diagnose and manage intrauterine abnormalities. Use of International Endometrial Tumor Analysis (IETA) may help predict the risk of endometrial pathologies based on ultrasound appearance. To determine the accuracy of 2D ultrasound and power Doppler in the examination of the endometrium using the international endometrial tumor analysis classification in predicting intrauterine disease among patients with endometrial pathology in Dr. Jose Fabella Memorial Hospital. A cross-sectional study was done on patients who were diagnosed with abnormal uterine bleeding and underwent 2D ultrasound and power Doppler studies. Sonographic features were classified using International Endometrial Tumor Analysis group classification and correlated with the histopathologic diagnosis. Seventy-three

patients were included in the study. The age of the subjects was significantly associated with the the histopathologic findings of benignity or malignancy. At 40-49 years old, there was significantly higher proportion of subjects with benign lesions, and 60 years and above had predominance of malignancy. The top three histopathologic diagnoses: endometrial polyp 41 cases (46.2%), proliferative endometrium 9 cases (12.3%), and simple hyperplasia without atypia 8 cases (11.0%). Patients diagnosed with malignancy had significantly thickened endometrium at 2.9 cm. The color content of the endometrium (color score) were statistically significant among different pathologies. Positive predictive value is the same for both, while Doppler showed a higher negative predictive value. Total accuracy was higher for Doppler. Both greyscale ultrasound and Doppler are 100% accurate in predicting benign lesions but Doppler has a higher accuracy in predicting malignant lesions. The IETA group consensus on descriptive and morphologic nomenclature in describing endometrial findings for power Doppler and on greyscale ultrasound is clinically valuable.

Keywords: *Ultrasound, Power Doppler, Terminology, Endometrium, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 4, 1-8
2017 July to August,
(Filipiniana Analytics)
NP

0340

The accuracy of frozen section of uterine lesions in the practice of gynecologic surgery: a retrospective assessment study in a tertiary government training hospital

Geraldino, Nelson T. , Domingo, Efren J. , Billod, Jimmy A.

This study aimed to determine the accuracy, sensitivity and specificity of frozen section (FS) in the diagnosis of uterine neoplasm in a tertiary government training hospital. This is a retrospective validation study from 2004-2015 involving cases of uterine lesions from gynecologic surgeries. All histopathologic results of frozen and paraffin sections were retrieved and reviewed. Chi square test with 2x2 Fischer Exact test adjustment was used to check for associations. Accuracy indices of FS tool were estimated such as sensitivity, specificity, likelihood ratios, negative and positive predictive values, and overall accuracy. A p-value of < 0.05 alpha is considered significant. A total of 143 uterine specimens were submitted for frozen section analysis. The utilization rate of FS is 1% per year. The FS results were correlated with the final histopathologic diagnosis with 96% agreement rate. Utilizing a median number of 3 sections per specimen provides an overall accuracy rate of 97%. The accuracy rate of FS is equal between combined benign-premalignant and malignant cases at 96%. The accuracy rate is not statistically affected by the procedure by which the specimen was taken, as well as the source and gross morphology of the specimen. Moreover, a minimum of 11 sections per specimen is needed to obtain an accuracy rate of 99-100%. The accuracy rate particularly for endometrial lesions is between 94 and 100%. Accuracy rates of frozen section on uterine lesions are high regardless of the sampling procedure and source of the specimen. Increasing the number of sections during FS parallels that of the final histopathologic diagnosis. FS for uterine lesions is a vital and cost-effective intraoperative decision tool to maximize care of patients.

Keywords: *Accuracy rate, Frozen section, Uterine lesion, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 3, 16-24
2018 May to June,
(Filipiniana Analytics)
NP

The accuracy of the international ovarian tumor analysis (IOTA) simple rules in predicting malignant ovarian tumors with biopsy as the reference standard

Balcita, Jediza Jessa B., Galbo, Pherdes E.

The IOTA Simple Rules provide a standardized ultrasound description in order to correctly classify ovarian tumors as benign or malignant even among non-expert readers. Its high accuracy rate was noted in foreign studies but was never validated in the local setting. The IOTA inconclusive tumors that were either assumed to be malignant or referred to experts in other studies were separately addressed in this research. To determine the accuracy of the IOTA Simple Rules to predict malignant ovarian tumors. Patients with ovarian tumors admitted for surgery with complete ultrasound records done at Women's Health Unit and those with histopathologic report from the Department of Pathology admitted to Department of Obstetrics and Gynecology in a tertiary hospital from August 2015 to February 2017 using a cross-sectional Diagnostic Accuracy Test. After obtaining approval from the IRB and Office of the Medical Director, the ovarian tumors were tallied and categorized according to their IOTA classification and final histopathologic diagnoses. The sensitivity, specificity, positive and negative predictive values, and accuracy were obtained using a 2x2 table. The biopsy reports of the inconclusive tumors were also reviewed and the sonographic characteristics of those which turned out to be malignant were noted. A total of 110 adnexal masses were included, with the IOTA Simple Rules applicable in 84.55% of cases. It produced an accuracy rate of 100%. Among the 17 inconclusive tumors, two proved to be truly malignant with the presence of only one papillarity in a borderline tumor and the complex appearance of a germ cell tumor. The IOTA Simple Rules is an accurate preoperative diagnostic tool in predicting ovarian malignancy. Two malignant tumors were classified as inconclusive and their sonographic characteristic of only one papillarity and the complex appearance of these tumors may warrant malignancy.

Keywords: *Inconclusive, IOTA Simple Rules, Ovarian cancer, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 5, 1-9
2017 September to October,
(Filipiniana Analytics)
NP

Accuracy of two dimensional ultrasonography in detecting lymph node metastasis in cases of uterine and cervical malignancies seen in a tertiary hospital: a five year restropective study

Reforma, Kareen N. , dela Llana, Kathlynn Ann R.

This study aims to determine the accuracy of two-dimensional ultrasound in detecting lymph node metastasis in uterine and cervical (stage IA2-IIA) malignancies. This is a five-year retrospective, cross sectional study conducted for 6 months among uterine and cervical malignancy patients who underwent bilateral pelvic lymph node dissection and para-aortic lymph node sampling with ultrasound performed within two months prior to surgery in a tertiary hospital. Ultrasound findings were compared with histopathologic results as gold standard. The study included 319 patients, 267 uterine and 52 cervical malignancies. Uterine cancer (pelvic-7.1% and para-aortic-2.6%) and cervical cancer (pelvic-1.95%) nodal involvement showed majority having round shape. Mean pelvic nodal size was 1.75 x 0.93cm-uterine, 1.83 x 0.93cm-cervical and para-aortic 3.3x2.0cm-uterine. The study revealed accuracy, sensitivity, specificity, PPV and NPV of 91.5%, 29.4%, 96.4%, 25.0% and 96.0% respectively for pelvic node metastasis and 95.6%, 11.1%, 98.1%, 14.3% and 97.4% respectively for para-aortic involvement. Ultrasound accuracy in detecting pelvic node extension was 98.1%-cervical and 90.3%-uterine (sensitivity-50% vs 26.7%; specificity-100% vs 94.1%; PPV-100% vs 21.1% and NPV-100% vs 95.6%). Para-aortic nodal metastasis detection among cervical and uterine cancer patients showed the following: accuracy (98.1% vs 95.1%), specificity (100% vs 97.7%), and NPV (98.1% vs 97.3%). Two-dimensional ultrasound is reliable in ruling in the presence of pelvic and para-aortic lymph node metastasis among patients with uterine and cervical malignancies. However, its low sensitivity of detection makes it less dependable in ruling out nodal involvement. Larger size and round shape of lymph nodes represent nodal meatastasis.

Keywords: *Uterine malignancy, Cervical malignancy, Pelvic lymph nodes, Para-aortic lymph nodes, Nodal metastasis, Two-dimensional ultrasound, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 4, 18-28
2017 July to August,
(Filipiniana Analytics)
NP

0343

Acquired platelet dysfunction with eosinophilia *Villanueva, Emilio III*

The study is about six-year-old male that was brought in with 1-month history of recurrent spontaneous bruising which resolves without intervention. There was no history of trauma, other bleeding episodes, medication intake, nor recent viral infection. Birth, past medical, and family histories were unremarkable. Pertinent physical examination showed multiple, non-tender ecchymosis of varying chronicity and sizes on his upper and lower extremities and abdomen. The rest of the examination was essentially normal. The patient was suspected of acquired platelet dysfunction with eosinophilia (APDE).

Keywords: *thrombocytes, thrombocytopathy, cell morphology, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 1, 50-51
2020,
(Filipiniana Analytics)

0344

Acupuncture as an alternative technique in establishing uterine contractions in contraction stress test: a randomized controlled trial *Arcangel, Corazon R. , Rivera, Leah Socorro N. , Tolentino-Orlina, Paula Christi P. , Holgado, Polla Lorence K.*

Acupressure may stimulate oxytocin release from the pituitary gland, which in turn regulates uterine contractions to improve the progress of labor; hence, studies have shown that acupressure on the Spleen 6 (SP6) point may be a complementary strategy for augmenting labor and/or shortening the first stage of labor without causing adverse effects to the mother or the newborn. To compare contractions produced by acupuncture technique from the contractions produced by conventional method using oxytocin in terms of: intensity, duration and interval of the uterine contractions and to determine if acupuncture technique at Sanyinjiao (spleen 6) and Hegu (Large Intestine 4) can be used as alternative method in establishing uterine contractions in Contraction Stress Test (CST) as a means of fetal surveillance. This is a Randomized Controlled Trial done in University of Santo Tomas Hospital. This included 54 term pregnant patients who met the inclusion criteria and were randomized into two groups: 27 patients in Acupuncture group and 27 patients in Oxytocin group (control group). All recruited patients were hooked to electronic fetal monitor to obtain baseline strips for 20 minutes. Acupuncture needles were applied bilaterally at Sanyinjiao (spleen 6) and Hegu (Large Intestine 4) for 20 minutes to the study subjects. Subjects who received acupuncture had greater intensity ($p=0.551$) and significant longer duration ($p=0.001$) of uterine contractions than the oxytocin group. However, there was significant shorter interval of uterine contractions after oxytocin treatment ($p=0.013$) than acupuncture. Furthermore, subjects who were in the acupuncture group obtained initial uterine contractions and achieved desirable uterine contractions faster than oxytocin. Application of acupuncture in Spleen 6 (Sanyinjiao SP6) and Large Intestine 4 (Hegu LI4) can initiate and induce uterine contractions faster. Acupuncture technique when compared to the conventional method using oxytocin, produces stronger and longer contractions. Furthermore, there is shorter mean time to achieve initial and adequate contractions thru acupuncture technique. Contractions also disappear in a much shorter time in acupuncture technique than in oxytocin group hence ideal for outpatient setting.

Keywords: *Acupuncture, Uterine contraction, Oxytocin, Medicine*

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0345

Acute coronary syndrome non-ST elevation in a young lady

Ho, James , Yap, Emily Mae , Toledano, Bryan Rene

Acute coronary syndrome (ACS) presenting as non-ST-elevation myocardial infarction (NSTEMI) in a very young Filipina female with a maternal history of premature coronary artery disease and no comorbidities is a rare occurrence and seldom suspected. An integral approach using clinical presentation, information derived from ECG, cardiac troponin and risk assessment criteria should be used in order to arrive at the proper diagnosis and management. The other challenges encountered were angioedema secondary to clopidogrel hypersensitivity and financial constraints. These factors should be taken into consideration when deciding the short and long-term treatment especially after percutaneous coronary intervention and stenting. A 27-year-old active, female, Filipino, single, with a normal body mass index, non-smoker non-alcoholic drinker, no use of recreational drugs, no history of previous hospitalization, and comorbidities presented with sudden onset severe angina accompanied by diaphoresis and dyspnea. She was immediately brought to a local hospital, 12LECG showed T wave inversion on the inferior leads, troponin I was positive at 0.51ng/ml (0-.08) She was given aspirin, followed by clopidogrel in which she developed periorbital edema, dyspnea and was treated immediately with intravenous hydrocortisone and maintained on cetirizine and prednisone for five days. The clopidogrel was shifted to cilostazol. A coronary angiogram was done which showed a severe coronary artery disease at proximal right coronary artery. She underwent percutaneous coronary with stenting and was discharged stable and improved. A delay in diagnosis and management may happen in a very young Filipino female presenting with acute chest pain and no comorbidities. A family history of premature coronary artery disease is a clinical marker of risk for acute coronary syndrome. A genetic testing may further establish this relationship. The clinical presentation of typical angina, T-wave inversions on inferior leads, highly abnormal cardiac troponin and very-high-risk criteria of recurrent or ongoing chest pain refractory to medical treatment warrants an immediate invasive strategy of coronary angiogram with revascularization. An angioedema secondary to clopidogrel hypersensitivity is a rare complication and can cause reluctance in a patient. The financial capacity to maintain long term treatment of dual antiplatelet should be considered for better compliance. A shared decision making between the physician and patient is a valuable tool in facing these challenges.

Keywords: *Myocardial infarction, Young adult, Cilostazol, Clopidogrel hypersensitivity, Case report, Medicine*

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NP

0346

Acute kidney injury in COVID-19 is associated with mortality: a meta-analysis

Daniella, Dian , Mariano , Lastiana, Ni Made

By March 2020, The World Health Organization (WHO) has declared Coronavirus disease-19 (COVID-19) as a global pandemic. Further investigations found that COVID-19 may lead to acute kidney injury (AKI). Some studies have been done, but the incidence and outcome of AKI in COVID-19 are variable between studies. Moreover, given the high number of COVID-19 cases in our country, we aimed to perform a systematic review and meta-analysis regarding the detailed outcome of AKI in COVID-19 patients as reported in the available literature. We performed a comprehensive literature search from several databases, such as EuropePMC, PubMed,

ProQuest, Directory of Open Access Journal (DOAJ), and related references between December 1, 2019, and December 5, 2020. The primary outcome was mortality, and the secondary outcomes were the need for Intensive Care Unit (ICU) care, severe and critical COVID-19 infection, and Acute Respiratory Distress Syndrome (ARDS). There were a total of 25,990 patients from 21 studies. Acute kidney injury was associated with increased odds of mortality (OR 13.43 [8.35, 21.60], $p < 0.00001$; I²: 82%, $p < 0.00001$), need for ICU care (OR 14.57 [8.51, 24.94], $p < 0.00001$; I²: 84%, $p < 0.0001$), critical COVID-19 (OR 10.41 [3.88, 27.90], $p < 0.00001$; I²: 67%, $p = 0.02$), and ARDS (OR 2.84 [1.30, 6.22], $p = 0.009$; I²: 91%, $p = 0.001$). Acute kidney injury is associated with mortality, need for ICU care, critical COVID-19 patients, and ARDS.

Keywords: AKI, COVID-19, Coronavirus, Mortality, Outcomes, Medicine

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0347

Acute kidney injury in non-shock dengue hemorrhagic fever patient

Alisjahbana, Bachti, Suseno, Joko, Darmawan, Guntur

Acute kidney injury (AKI) is one of the severe complications in dengue hemorrhagic fever, usually occurred in shock. We report an interesting case of AKI in a hemodynamically stable dengue hemorrhagic fever patient. An 18-year-old male dengue fever patient referred to our institution in his day eight of illness due to three days of decreased urine output. He was hemodynamically stable with thrombocytopenia, increase in creatinine, positive for Anti dengue IgM, proteinuria, and hematuria. Ultrasound examination showed ascites. He was diagnosed with AKI stage III related to dengue hemorrhagic fever and underwent hemodialysis. A total of four series of hemodialysis and furosemide drip were performed during 12 days of admission and he was finally improved. Renal injury might occur in hemodynamically stable dengue hemorrhagic patients. It is a reversible condition; hence, appropriate treatment and close monitoring result in good outcomes.

Keywords: Acute kidney injury, Dengue hemorrhagic fever, Dengue infection, Stable hemodynamic, Medicine

Philippine Journal of Internal Medicine, Volume No. 58 Issue No. 1, 39-41
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NP

0348

Acute limb ischemia: a rare and devastating complication of infective endocarditis

Tuano, Norberto O., Medrano, Ana Beatriz R., Cuenza, Lucky R., Yap, Emily Mae L.

In contrast to embolic events to the brain, lungs and spleen which have been comprehensively discussed in literature, acute limb ischemia (ALI) due to septic embolism (SE) from infective endocarditis (IE) are uncommonly reported. There have been no reported cases of ALI as a complication of IE among Filipinos to date making this case report the first in our country. We report two cases of community-acquired native valve endocarditis caused by streptococcus spp. and enterococcus faecalis. Both patients had large and mobile vegetations in the mitral valve and aortic valve respectively on transthoracic echocardiography. The first one developed ALI (IIa) on the R leg after the initiation of antibiotics. The second case presented with ALI (IIa) on the R leg on admission. They were given the appropriate antibiotics and received systemic anticoagulation with heparin. The first case underwent successful emergency embolectomy on the R leg but developed new-onset ALI on the L leg and refused further intervention. Embolectomy was also recommended on the second patient who also re-fused any intervention. Despite maximal medical management, both patients subsequently expired. Infective endocarditis (IE) patients are at risk to develop SE before or during the initiation of appropriate

antibiotics. ALI is a life threatening extra cardiac complication of IE. Early recognition and prompt aggressive management are therefore imperative.

Keywords: *Infective endocarditis, Acute limb ischemia, Septic embolization, Large vegetation, Case series, Medicine*

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NP

0349

Adenomyosis in Mayer-Rokitansky-Kuster-Hauser syndrome *Pacuing-Songco, Debby F. , Ramos, Laurice Gizelle C., Reyes, Maria Lilia T.*

Mayer-Rokitansky-Kuster-Hauser syndrome, the second most common cause of primary amenorrhea, is a congenital anomaly caused by defective Mullerian duct development. It is the absence of uterus, cervix and upper two thirds of the vagina that results in primary amenorrhea. This is a case of a 42-year-old, nulligravid with primary amenorrhea complaining of acute abdominal pain. She has no co-morbidities or previous surgeries. Examination revealed an absent cervix and a left adnexal mass. Ultrasonography revealed an atrophic uterus with no endometrial stripe and cervix, with possible ovarian tumor versus myoma. Impression was mullerian agenesis with pelvoabdominal mass in torsion. She then underwent total abdominal hysterectomy with bilateral salpingectomy and adhesiolysis. Intraoperatively, there were two hemiuteri connected by a fibromuscular stalk. Left hemiuterus was dextrorotated, adherent to the sigmoid mesentery and peritoneum. Histopathology confirmed absence of endometrial cavity but with adenomyosis in bilateral uterine buds. Chromosomal analysis confirmed 46, XX karyotype.

Keywords: *Adenomyosis, Primary Amenorrhea, Mullerian Agenesis, Medicine*

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2019 November to December,
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NP

0350

Analysis of trends in maternal mortalities in Bicol region using national health surveys and maternal death reviews

Llave, Cecilia L. , San Juan, Filomena S. , Garcia, Jr., Fernando B. , Salonga, Raymark D. , Ang-Bon, Rita Mae , Cagayan, Ma. Stephanie Fay S., Llamas-Clark, Erlidia F.

Since 1976, Bicol Region had higher maternal mortality ratio (MMR) than the Philippine average and became the fourth region with the highest MMR in 2012. Looking at trends of maternal health outcomes and determining risk factors among mothers who died may guide interventions to reduce MMR. To determine the changes in maternal mortality ratio (MMR) in the Bicol region from 2004 to 2017 and determine the sociodemographic profile of pregnant women who died from 2015 to 2018. A records review of Bicol's Regional Field Health Services Information System from 2004 to 2017 and maternal death review reports from 2015 to 2018 was done. Changes in MMR was determined using Poisson regression. The sociodemographic characteristics and causes of maternal deaths were analyzed using frequencies and proportion. From 2004 to 2017, MMR of 100.9 remained higher than the regional target of 31.6. Significant reductions in MMR were achieved in 2007 to 2008 and in 2011 to 2012 wherein MMR ranged between 75.3 to 89.3. However, by the end of 2012, maternal deaths again increased which reached 122.5 in 2017. From the maternal death reviews, it was observed that 29.5% of maternal deaths were aged 35 years and above and 7.5% were less than 20 years old. Mothers who had more than five pregnancies were 30.1% of total deaths. In terms of place of death, 15.7% died at home or in-transit to referral facilities. Hemorrhage

or hypertension-related causes were the leading reasons for maternal deaths. Significant reduction in MMR was not sustained after 2012 and higher deaths were reported in the succeeding years. Maternal deaths can be further reduced by using a systems approach, by promoting family planning, and by strengthening service delivery networks to effectively manage hemorrhage and hypertension-related emergencies.

Keywords: *Maternal Mortality, Maternal Health, Health Services Delivery, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 6, 39-48
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NP

0351

Androgen insensitivity syndrome (AIS)

Alensuela, Anna Belen I. , Iskandar,

Androgen Insensitivity Syndrome (AIS) is a rare condition, it is an X-linked-mutation that is considered as a disease caused by resistance of androgen receptor to its actions. It is expressed in a variety of phenotypes ranging from male infertility to completely normal female external genitalia. This is a case of a 25-year old with Complete Androgen Insensitivity Syndrome (CAIS), presented as phenotypical female with secondary sexual development, bilateral inguinal masses. Gonadectomy, estrogen replacement therapy and psychological support are part of long term management.

Keywords: *Androgen insensitivity syndrome, Complete androgen insensitivity syndrome, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 2, 38-46
2016 June,
(Filipiniana Analytics)
NP

0352

Angiomyofibroblastoma of the vulva: a diagnostic dilemma

Poblete, Rex Marco M. , Romblon, Katrina D.

Angiomyofibroblastoma (AMFB) is a rare, benign, well-circumscribed mesenchymal soft tissue neoplasm predominantly occurring in the vulvovaginal region among women of reproductive age (35-45 years old). Histologically, it is characterized by presence of alternating hypo and hypercellular areas containing spindle and round stromal cells admixed with blood vessels. At present, there are 137 cases reported since it was first described in 1992. Currently, there are no published cases of Angiomyofibroblastoma in the Philippines. This is a case report of a 31-year old, nulligravid patient who presented with unilateral labial enlargement which was noted to be painless and slow growing. The initial impression was that of a benign tumor of the labia. The mass was excised and histopathologic results were consistent with the microscopic findings of Angiomyofibroblastoma. Simple excision of the mass is the only treatment, as in this case, and is noted to have extremely low rate of recurrence. The clinical importance to distinguish this unusual neoplasm from Aggressive Angiomyxoma and other mesenchymal malignant neoplasm with metastatic potential should be emphasized for appropriate management.

Keywords: *Angiomyofibroblastoma, Mesenchymal Tumors, Vulva, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 3, 30-36
2018 May to June,
(Filipiniana Analytics)
NP

Arteriovenous malformation: a review of four cases

Gorgonio, Nephtali M. , Dominguez, Anna Eloisa M.

In summary, we presented 4 cases of uterine arteriovenous malformation, all presenting with heavy, refractory bleeding. These cases were diagnosed using gray scale and color Doppler studies, as well as CT angiography. Treatment differed based on specific clinical findings, patient status, and desire for fertility preservation. And although more advanced interventions have been discovered, surgical management like a hysterectomy may still be performed when other options are unavailable or not feasible. Diagnostic modalities and treatments employed should be individualized to every patient's needs. In a patient presenting with unexplained, intermittent vaginal bleeding, especially with a history of previous operations, or curettages, it is worth considering uterine arteriovenous malformation as a probable cause. The lack of any hard-set rules or algorithms, as well as the scarcity of information regarding and dealing with this condition, emphasizes the importance of documentation and dissemination of literature. A high index of suspicion is necessary to properly work up and identify or exclude this diagnosis.

Keywords: *Uterine arteriovenous malformation, CT angiography. Treatment, Intermittent vaginal bleeding, Medicine*

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NP

Assessing myometrial infiltration by measuring the tumor free distance and depth of invasion through 2D transvaginal ultrasound among patients with endometrial cancer

David-Bustamante, Lara Marie , Navarete, Harry C. Jr.

Myometrial invasion is one of the most important prognostic factors in the preoperative evaluation of patients with endometrial cancer. Several techniques have been used for the preoperative evaluation such as transvaginal ultrasound (TVS), magnetic resonance imaging (MRI) and computed tomography (CT). Transvaginal ultrasound has been shown to have comparable accuracy with MRI, cost effective and is widely available. To determine the diagnostic accuracy of 2D transvaginal ultrasound in assessing myometrial infiltration by measuring the tumor free distance (TFD) and depth of invasion (DOI) among patients with endometrial cancer admitted for elective gynecologic surgery at Philippine General Hospital Department of Obstetrics and Gynecology. This prospective validation study involved 49 patients with endometrial cancer admitted for elective surgery at the Department of Obstetrics and Gynecology of the Philippine General Hospital from October 1, 2016 to February 28, 2017. All patients had 2D transvaginal ultrasound at least within 1 week prior to schedule of surgery. The tumor free distance (TFD) and the depth of invasion (DOI) were prospectively measured and compared with the histopathologic result. Diagnostic accuracy in assessing myometrial infiltration by measuring the tumor free distance and depth of invasion through 2D transvaginal ultrasound were computed and test of association was done using 2x2 Fischer Exact test at 0.05 α while AUC-ROC was plotted. The association between transvaginal ultrasound and final histopathology in assessing the myometrial infiltration was statistically significant ($p=0.004$). Moreover, the transvaginal ultrasound for assessing myometrial infiltration demonstrated 94.4% sensitivity and 43.8% specificity in detecting >50% infiltration wherein a likelihood would likely to occur by 1.68 times higher than those with <50% based on the final histopathology. Moreover, the accuracy values of TVS reflected in the AUC index were as follows, a TFD cut off value of ≤ 0.82 cm showed a higher sensitivity (46.88%) and specificity (100%) in predicting >50% myometrial infiltration while a DOI ratio of 0.50 is the cut off value which initiated a sensitivity (16.7%) and a higher specificity (75%) in predicting >50% infiltration. Finally, TFD (AUC = 0.749) yielded a higher accuracy as compared with DOI (AUC = 0.388) in predicting myometrial infiltration. Assessment of myometrial infiltration by measuring the tumor free distance and depth of invasion through 2D transvaginal ultrasound among patients with endometrial cancer demonstrated clinically acceptable accuracy with higher sensitivity in detecting >50% myometrial infiltration. TFD (cut off value of ≤ 0.82 cm) has a higher accuracy compared with DOI in predicting >50% myometrial infiltration.

Keywords: Endometrial Cancer, Tumor Free Distance (TFD) Depth of Invitation (DOI), Medicine

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NP

0355

Assessment of climacteric symptoms among Filipino women ages 40 years and above seen at a tertiary hospital in Metro Manila

Maceren-Medina, Catherine Irene L. , Calimbas, Krystle R.

The common climacteric symptoms experienced by women 40 years and above can be classified into vasomotor, physical, psychological and sexual complaints. This may be associated with sociodemographic factors. The timing of menopause is also believed to be associated with sociodemographic factors. To determine the prevalence and associated factors of climacteric symptoms experienced by women ages 40 years and above seen at a Tertiary Hospital in Metro Manila. By using Modified Menopause Rating Scale questionnaire (Rahman, et al.), 360 Filipino women aged 40 years and above were interviewed and were asked of their sociodemographic data and presence of climacteric symptoms (divided into somatic, psychological and urogenital domain). Majority of the participants had menopause at age 51, with mean age at menopause of 48.4 + 3.58 (SD) years. The most prevalent symptom reported was joint and muscular discomfort (65-75%) and this was more common among perimenopausal women. This was also the most common reason for absence at work of the participants. There was no significant association found between sociodemographic factors and climacteric symptoms, as well as with the timing of menopause. Unlike other studies in different countries, no significant association was found on this study between sociodemographic factor and climacteric symptoms. Sociodemographic factors also did not show any significant association with the timing of menopause.

Keywords: Climacteric, Menopause, Menopause rating scale, Menopausal symptoms, Medicine

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(Filipiniana Analytics)
NP

0356

Assessment of the knowledge, attitude and practice of pregnant women towards hepatitis B infection seen at a tertiary hospital in the Philippines

Arada, Maria Angelica B., Jose, Stella Marie

Multiple studies have described the insufficiency in knowledge, attitude and practices of the general population and of healthcare workers towards HBV infection across different countries. This study aims to assess the knowledge level and correlate it with the attitude and practices of pregnant women towards Hepatitis B infection. This is a descriptive study on pregnant women consulting for their first antenatal visit in the outpatient department of a tertiary hospital. A structured self-administered questionnaire, adapted from a study by Han et al, was reviewed and modified by infectious disease experts, and then validated prior to use. 164 pregnant patients, aged 18-45 years old, were recruited. Logistic regression analysis was used to correlate attitude and practice to knowledge scores. Most participants (48.78%) belonged to the 18-25-year old age group. Only 7.32% of the participants answered all knowledge questions correctly while 39.02% answered at least 2/3 of the questions correctly. Knowledge scores were not associated with patient demographic information but were correlated with their attitude and practices towards Hepatitis B infection. A lack of knowledge regarding Hepatitis B infection exists among pregnant patients. Government and private institutions must invest time and effort to bridge this knowledge gap. Health promotion should be directed towards the pregnant population since vertical transmission remains to be the most common route of transmission in our country.

Keywords: Hepatitis B, HBV, Pregnancy, Knowledge, Attitude and Practices, Medicine

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NP

0357

Association between anemia and intestinal parasitism among pregnant women (ages 15-44 years-old) attending antenatal clinic in a tertiary hospital

Reyes, Ida Magnolia Y. , Amado, An Jubyl Y.

Intestinal parasitic infection is one of the leading public health problems encountered more especially of the developing countries. Parasitic infections affect millions of pregnant women worldwide, and may directly or indirectly lead to a spectrum of adverse maternal and fetal effects, one of which is anemia that may result to detrimental fetal and maternal outcomes. The objective of this study is to determine the prevalence of intestinal parasitism and anemia among pregnant women ages 15-44 years old consulting for antenatal check-up in a tertiary hospital. Study population was based on inclusion criteria and was significance was statistically determined using odds ratio statistical analysis using SPSS software. The results of this study showed evidences of an alarming association between prevalence of soil-helminthiasis and anemia among Filipino pregnant women. These diseases have been a major global public health concern and up to date have been very difficult to address despite the efforts done by the local and international health organizations. Although this study is limited only in gathering sufficient data on the prevalence of anemia and intestinal parasitism, this may have provided future researches on possible benefits of deworming among pregnant women. Health education and promotion truly have great impact in reducing the prevalence of the burden of these diseases. Therefore, antenatal care should be further emphasized in improving the maternal health in the country.

Keywords: Anemia, Intestinal Parasitism, Medicine

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2015 September,
(Filipiniana Analytics)
NP

0358

Association between VEGF + 936 C> T gene polymorphism with degrees of neutrophils and lymphocytes infiltration in gastritis

Lindarto, Dharma , Siregar, Gontar A , Tarigan, Junita

Activation of angiogenesis stimulated by Vascular endothelial growth factor (VEGF) in host cells play a role in response to damaged gastric mucosal in gastritis patient with *Helicobacter pylori* (*H. pylori*) infection. The study showed that presence of polymorphisms in VEGF gene is associated with an increased risk of several disorders like gastric cancer. Infiltration of neutrophils in the gastric mucosa characterized acute gastritis. It can become chronic inflammation characterized by lymphocyte infiltration. This condition will complicate glandular atrophy and intestinal metaplasia in the gastric mucosal epithelium and subsequently cause gastric malignancy. The aim of this study to analyze association between VEGF +936 C>T polymorphism gene with degree of neutrophils and lymphocytes infiltration in gastritis patients with *H. pylori*. Samples were obtained through consecutive sampling in April-August 2019. Gastritis was ensured by endoscopy while histological feature was defined by Sydney system. *H. pylori* was examined by Campylobacter Like Organism test (CLO) and VEGF + 936 C> T gene polymorphism was ensured using PCR TaqMan SNP Genotyping Assay rs2010963. Chi-square analysis was used in this study to determine the association between VEGF + 936 C>T gene polymorphism with degree of neutrophils and lymphocytes infiltration. Of 60 gastritis patients, there were CT genotype (37.5%), followed by CC genotypes (36.7%), and TT genotypes (35%). Patients with CC genotype increased the risk of 18 times

moderate and severe neutrophil infiltration compared to CT+TT genotypes ($p=0.001$). There was no relationship between VEGF + 936 C>T polymorphism and the degree of lymphocytes infiltration ($p=0.293$). There was a significant association between VEGF + 936 C>T polymorphism and the degree of neutrophil infiltration but there was no association between VEGF + 936 C>T polymorphism and the degree of neutrophil infiltration.

Keywords: *VEGF+936 C>T polymorphism, Gastritis, h. pylori, Medicine*

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(Filipiniana Analytics)
NP

0359

The association of chronic hepatitis B infectivity with fetomaternal outcome: a retrospective cohort study in a tertiary hospital

Jose, Stella Marie L. , Mendoza, Irish T.

Hepatitis B infection on pregnancy has been linked to preterm labor, risk of prematurity, low birth weight, and the occurrence of gestational diabetes mellitus. To determine the association between Chronic Hepatitis B infectivity and fetomaternal outcome such as preterm birth, low birth weight, gestational diabetes and preeclampsia among pregnant patients admitted in a Tertiary Hospital. A retrospective cohort study was done among pregnant women diagnosed with chronic hepatitis B infection admitted in a tertiary hospital from January 1, 2014 to December 31, 2018. The association of Hepatitis B infectivity and fetomaternal outcomes namely preterm birth, gestational diabetes, preeclampsia and low birth weight was determined. Chronic Hepatitis B infection had 1.43% prevalence among the study group. 149 patients were able to fulfill the inclusion criteria. Pregnant women with high infectivity Hepatitis B infection tend to be younger, have lower BMI, have lesser gravidity and parity than patients who are nonreactive to Hepatitis B e-antigen. AST and ALT were also higher among those with high infectivity Hepatitis B. However, there was no significant difference among the two groups in terms of elevated ALT. There was no significant association between Hepatitis B infectivity and fetomaternal outcomes such as preeclampsia, gestational diabetes mellitus, preterm birth and low birth weight. There is no increased risk for patients with high infectivity for preeclampsia, gestational diabetes mellitus, and low birth weight. There appears to be an excess risk in the likelihood of preterm birth/labor among those women who have a high infectivity Hepatitis B infection during pregnancy. The prevalence of chronic hepatitis B infection among Filipino pregnant women admitted in a tertiary hospital was 1.43% from 2014 to 2018. There was no association between chronic hepatitis B infectivity and preeclampsia, Gestational diabetes mellitus. There seems to be an increased risk for HBeAg positive patients for preterm birth preterm labor, and occurrence of low birth weight, but was not statistically significant in the study population.

Keywords: *Chronic hepatitis B infectivity, Fetomaternal outcome, Medicine*

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NP

0360

Association of erectile dysfunction and extent of coronary vessel involvement by syntax score in coronary artery disease patients undergoing coronary angiography at Perpetual Succour Hospital from October 2014 – September 2015

Tiempo, Edwin K. , Junia, Alex T. , Calinawagan, Brian Joseph M.

Erectile dysfunction (ED) has numerous links to cardiovascular disease. Numerous studies show the severity of ED is strongly associated with atherosclerosis and endothelial dysfunction implicated in the pathogenesis of

coronary artery disease (CAD). These common vascular pathways have led to evidence that ED onset may be used as a marker of the severity of CAD as well as a pre-clinical marker of early onset-CAD. The researchers aim to determine the association of ED and CAD in terms of prevalence, clinical presentation and severity and extent of vessel involvement by SYNTAX score among CAD patients undergoing coronary angiography. This is a prospective, cross sectional, analytical study design set at Perpetual Succour Hospital – Cebu Heart Institute, a private, tertiary hospital with cardiac specialty units located in Cebu City. This study includes all Filipino patients admitted at Perpetual Succour Hospital suspected to have coronary artery disease based on symptoms of angina, dyspnea or other anginal equivalent with indications to undergo coronary angiography during the period of October 1, 2014 to September 30, 2015 were included. A total of 160 patients were included in the study. The mean age is 57.23 years with most of the patients admitted for stable ischemic heart disease (SIHD) of 54.7%, non-ST elevation acute coronary syndromes (NSTEMI) 33.5% and ST-elevation myocardial infarction (STEMI) 11.8% with multiple cardiovascular risk factors like hypertension, diabetes mellitus, smoking and dyslipidemia. Eighty-two percent complained of ED symptoms with a mean International Index of Erectile Function (IIEF) score of 15.15. Most ED patients identified had mild to moderate ED (31.7%), mild ED (21.7%), moderate ED (17.4%) and severe ED (11.8%). There were only 17.4% of patients who had undergone coronary angiography for CAD complaints that had no ED symptoms on admission. Per clinical presentation, there was a significant association between patients presenting with severe ED, moderate ED and mild to moderate ED with those presenting with SIHD and ACS-NSTEMI on admission, moderate ED and mild to moderate ED. ED was significantly associated with obstructive CAD ($p=0.001$) and correlated directly with the number of vessels involved ($p<0.01$) and inversely related to SYNTAX scores ($p<0.001$). ED symptoms were noted to precede CAD diagnosis by 4.9 to 5.9 years. In conclusion, there is a high prevalence of ED among CAD patients and its existence is significantly associated with obstructive CAD varying directly with extent and number of vessel involvement. There is a significant inverse relationship with severity of ED and SYNTAX scores. The existence of ED was present in all subsets of CAD patients, regardless of presentation of admission and preceded CAD symptoms and diagnosis by four to five years.

Keywords: *Erectile dysfunction, Coronary artery disease, Syntax score, Medicine*

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 (Filipiniana Analytics)
 NP

0361

The association of histopathologic features and postmolar gestational trophoblastic neoplasia among patients with complete hydatidiform mole

Samonte, Kathleen Gizelle J., Soriano-Estrella, Agnes L.

The study aims to correlate the histopathologic characteristics of patients diagnosed with complete hydatidiform moles with the risk of developing postmolar gestational trophoblastic neoplasia. A retrospective review of 71 histopathologically-confirmed cases of complete hydatidiform moles was made. Group 1 consisted of 65 patients who achieved normal titers and remained to have normal β -hCG titers after at least 1 year of follow up. Group 2 included 6 patients who developed postmolar gestational trophoblastic neoplasia. Histopathologic slide review was done to assess the following: trophoblastic proliferation, nuclear atypia, hemorrhage, necrosis along with measurement of the shortest diameter of the largest hydropic villus. The association of the histopathologic features and the development of postmolar gestational trophoblastic neoplasia was done using chi square. Analysis of the association of histopathologic features included in the study predictive of the development of postmolar gestational trophoblastic neoplasia was done. Analysis of several histopathologic parameters which may precisely identify which patients with complete hydatidiform moles were more likely to develop postmolar gestational trophoblastic neoplasia failed to produce statistically significant results. However, among the all the features studied, the presence of extensive necrosis favored the occurrence of postmolar sequela. Trophoblastic proliferation, nuclear atypia, hemorrhage and villus size of complete hydatidiform moles do not predict progression to postmolar disease. In spite of this, all patients with complete hydatidiform moles should be considered for prophylactic chemotherapy or should be monitored closely.

Keywords: *Complete hydatidiform mole, Postmolar gestational trophoblastic disease, Histopathologic features, Villus size, Medicine*

Association of HIV knowledge, testing attitudes and risk assessment with the acceptance rate of HIV counseling and testing among pregnant Filipino patients seen in a tertiary government hospital

Madamba, Helen V. , Cardenas-Hamoy, Lorelyn C.

HIV counseling and testing (HCT) should be routinely offered to all pregnant patients since HCT is considered as a gateway to the access of treatment and prevention of spread to non-infected individuals. This study aims to determine the association of HIV knowledge, testing attitudes and risk assessment for HIV with the acceptance of HIV counseling and testing among pregnant patients seen at the antenatal clinic of a tertiary government hospital. A total of 293 respondents were included and asked to answer an investigator-guided self-administered questionnaire on HIV knowledge, testing attitudes, assessment of risk for HIV and acceptance of HIV counseling and testing. Results were analyzed using descriptive statistics and multiple logistic regression analysis. The respondents of this study were on average 28 years old, with a range of 15 to 44 years old, mostly Catholic and single, high school graduates who are currently unemployed. The respondents generally have low level of HIV knowledge, positive testing attitudes and assessed to be at low risk factors for HIV. The findings showed level of knowledge and condom use was not associated with acceptance of HIV counseling and testing. Acceptance of HIV counseling and testing was significantly associated with positive testing attitudes, and low prevalence of risk factors such as, no history of multiple sex partners, no history of IV drug use, no history of imprisonment and no history of having sex in exchange for money or drugs.

Keywords: *HIV knowledge, Testing attitudes, HIV counseling and testing, Pregnancy, Medicine*

Association of hypokalemia and preeclampsia and correlation of levels of serum potassium to blood pressure severity in preeclampsia

Cacas-David, Ireene G. , Paulino-Morente, Joanne Marie A.

Although decreased potassium levels may have a role in the etiopathogenesis of preeclampsia, small number of studies has been done to determine their relationship. This study was done to know whether serum potassium is significantly decreased in hypertensive disorders of pregnancy, to determine if the level of potassium correlates with the severity of hypertension, to know whether we can recommend serum potassium as part of preeclamptic work up, and ultimately, to determine if potassium supplementation can be advised to preeclamptic women during prenatal check-up. In this prospective, cross sectional study, subjects were 338, 169 of whom had uncomplicated pregnancies, while 169 had preeclampsia (72 of whom had systolic BP(SBP) 140-150mmHg, while 97 had SBP \geq 160mmHg). Baseline serum potassium were taken upon admission. The mean serum potassium was significantly lower at 3.37 ± 0.41 mmol/L (p -value < 0.0003) in hypertensive women (versus 3.62 ± 0.31 mmol/L in uncomplicated pregnancies). Furthermore, the serum potassium was significantly decreased in patients with SBP > 160 mmHg (3.31 ± 0.46) when compared with those with SBP 140-150 mmHg (3.45 ± 0.32), with $p = 0.013$. Wilcoxon Signed-Rank Test showed Z-value -5.68 (significant at $p \leq 0.05$), showing a significant difference between the level of serum potassium in normotensive compared to hypertensive patients. Chi-Square test showed $X^2 \approx 45.46$ (in the critical region 5.9), therefore the level of serum potassium is dependent on the level of BP. Pearson Correlation

coefficient showed $r = -0.1135$ stating a negative correlation, hence, as the BP increases, serum potassium decreases. This study suggests that hypokalemia observed in preeclamptic patients may bring about altered homeostasis in serum and therefore may act as predisposing factors in pathogenesis of preeclampsia. The authors recommend the addition of serum potassium as part of the criteria of severity of preeclampsia. Hypertensive pregnant women are advised to consume diet containing adequate amount of potassium or have a potassium supplementation during prenatal check-up.

Keywords: *Hypokalemia, Preeclampsia, Medicine*

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NP

0364

Association of intrapartum maternal blood glucose control and neonatal hypoglycemia in a private tertiary hospital

Gonzaga, Zarinah R. , De Leon, Maria Edwardina G.

Diabetes in pregnancy is associated with maternal and fetal risks that include maternal hyperglycemia and neonatal hypoglycemia. Intrapartum plasma glucose concentration has a stronger association with decreased neonatal hypoglycemia paralleled with antepartum plasma glucose levels. The objective of the study is to determine the association between intrapartum glucose monitoring and neonatal hypoglycemia. This is a retrospective cohort study that involves parturients of any age with term gestation (>37 weeks) with gestational type or overt type of diabetes mellitus, either insulin-requiring or on medical nutrition therapy, with or without mean capillary blood glucose levels during labor. Multiple logistic regression was used for analysis, which quantifies the magnitude of association between maternal blood glucose control and neonatal hypoglycemia adjusted for significant confounders. The incidence of diabetes among pregnant in this private tertiary hospital over the study period was 7.82%. Most of the diabetic parturients were primigravid, with gestational type of diabetes mellitus, and on medical nutrition therapy. More than half were referred to an endocrinologist intrapartum. The incidence of maternal hyperglycemia intrapartum is 33%. The birthweights of the neonates ranged from 2095 to 5250 grams. Among the diabetic parturients, the incidence of neonatal hypoglycemia is 10%. There was no significant association between neonatal hypoglycemia and intrapartum maternal hyperglycemia ($p=0.05$). There is no significant association between intrapartum maternal hyperglycemia and development of neonatal hypoglycemia. Antepartum and intrapartum management of maternal hyperglycemia did not appear to be associated with the development of neonatal hypoglycemia. A standardized institutional management protocol on glucose monitoring and control among diabetic parturients is strongly suggested.

Keywords: *Diabetes in pregnancy, Intrapartum blood glucose monitoring, Neonatal hypoglycemia, Medicine*

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2016 March,
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NP

0365

Awareness and practices on adult vaccination of obstetrician-gynecologists in the Philippines

Manalastas, Ricardo M. , Elauria, Jean Aileen M.

Adult vaccination is necessary in the prevention of many of the most common infectious diseases because immunity from infant vaccination typically wanes in adulthood. In the female population, the obstetrician-gynecologist is placed at the forefront of health promotion and disease prevention. In 2011, the Philippine

Obstetrics and Gynecology Society (POGS) released a Clinical Practice Guideline on Immunization for Filipino Women but no study has been done to determine its impact. This study determined the awareness and practices of OB-GYN specialists on adult vaccination and their perceived hindrances to routine administration of the recommended vaccines. A self-administered questionnaire was given to the POGS fellows through email, phone and personal visits. Almost all of the respondents (95%) were aware of Clinical Practice Guideline on Immunization but only 4% of the OB-GYNs routinely administered all the vaccines. The most common vaccine administered was Human Papilloma Virus (HPV) vaccine (42.7%), followed by Influenza virus vaccine (28.1%), and Hepatitis B vaccine (27.3%). There is no significant relationship between age of the respondent, the number of years in practice, place of practice, affiliation with a teaching hospital, or subspecialty training and vaccine recommendation and administration. There is a significant positive relationship between awareness of the guidelines and the frequency of recommending the Tetanus-Diphtheria-Pertussis (Tdap) vaccine and the Influenza vaccine. Similarly, awareness of the guidelines was related to increased frequency of administering the Human Papilloma Virus (HPV) vaccine and the Influenza vaccine. Hence, adult vaccination coverage may be promoted by increasing the awareness of the obstetrician-gynecologists of the POGS Clinical Practice Guidelines on Immunization. Although cost remains to be an issue (identified by 93% of the respondents), increasing awareness among OB-GYNs on the importance of adult vaccination through the CPG on Immunization and/or through attendance of the Vaccinology 101 Course through vaccinology courses may ultimately help decrease the incidence of some of the most common infectious diseases affecting the Filipino women and their children.

Keywords: *Awareness, Obstetrician-gynecologist, Practices, Vaccination, Medicine*

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 (Filipiniana Analytics)
 NP

0366

Awareness on and availment of Philhealth's maternity care benefits among the selected patients of a tertiary hospital in Southern Luzon from February 2015 to February 2016

Burog, Honorata Lalaine P. , Bernardino, Joeima D.

In spite of policy changes and government programs aimed to improve maternal health and reduce maternal morbidity, the Philippines failed to achieve its Millennium Development Goals targets because of several identified factors. To determine the relationships of maternal profile and awareness on and availment of PhilHealth maternity care benefits among the selected patients of a Tertiary Hospital in Southern Luzon Department of Obstetrics and Gynecology were investigated from February 2015 to February 2016. Descriptive cross-sectional survey method was used in the study involving 365 respondents selected through convenience sampling. Chi-square test and Cramer's V was used to determine relationships among the variables. Maternal profile, which included the patient's age, educational attainment, employment, family income, health insurance coverage, access to mass media and the Internet and number of pregnancies were considered as an intervening variable. The results of the study revealed low level of benefit awareness even for the respondents who have existing PhilHealth coverage. They also failed to avail most of the benefits. Statistical analyses revealed that age, family income, health insurance coverage and number of pregnancies were significantly related to awareness while only family income and health insurance coverage were significantly related to availment. It was established further those pregnant women who were more aware of their benefits were more likely to avail them. To achieve optimum availment of benefits, an iterative process of awareness campaign should be instituted starting from high school education to women's employment and from initial contact with Barangay Health Workers to their consultation with health care providers.

Keywords: *Awareness, Availment, PhilHealth, Medicine*

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 (Filipiniana Analytics)
 NP

Balanced crystalloids versus normal saline as intravenous fluid therapy among critically ill patients: a meta-analysis of randomized controlled trials

Benedicto, Jubert P. , Chiu, Harold Henrison C. , Chua, Jamie R.

Recent studies on critically ill adults has shown that use of normal saline with its supraphysiologic chloride content has been associated with an increased incidence of hyperchloremic metabolic acidosis, acute kidney injury (AKI), renal replacement therapy (RRT), hypotension and death. The objective of this meta-analysis was to assess the clinical outcomes associated with the use of balanced crystalloids versus normal saline solution. We searched PubMed/MEDLINE, Embase and Cochrane Library (CENTRAL) databases in accordance with PRISMA guidelines. Our inclusion criteria were the following: randomized controlled trials, adult critically ill patients, comparisons between patients receiving either balanced crystalloids (lactated ringer's solution, plasma-lyte) or normal saline, and at least one endpoint that measure intensive care unit mortality, risk of AKI (defined as stage 2 or greater in the RIFLE criteria) and risk of RRT. Risk ratios (RRs) and confidence intervals (C.I) were calculated via Review Manager Version 5.3 using the fixed-effect modelling. A total of four randomized controlled trials, which were all assessed to be good quality and low risk of bias, with 19,105 patients were included. Use of balanced crystalloids showed a trend towards lower incidence of AKI (RR 0.94, 95% C.I [0.87-1.02], P=0.69), RRT use (RR 0.91, 95% C.I. [0.77-1.07], P=0.29) and ICU mortality (RR 0.91, 95% C.I. [0.82-1.01], P=0.95). There is no significant heterogeneity identified. Use of balanced crystalloids as intravenous fluid therapy among critically ill patients demonstrated a trend toward lower incidence of AKI, RRT and ICU mortality, compared to normal saline solution.

Keywords: *Intravenous fluids, Acute kidney injury, Critical illness, Medicine*

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NP

Bamboo node as an unusual cause of dysphonia in a Filipino patient with mixed connective tissue disease

Del Mundo, Daryl Anne A. , Salido, Evelyn O. , Carillo, Ryner Jose D. , Quilisadio, John Elmer C.

Bamboo node is a rare vocal cord pathology causing dysphonia among patients with autoimmune disorders. These "bamboo-joint-like" transverse deposits on the vocal cords interfere with the vibratory cycle during phonation leading to voice hoarseness. A review of Schwemmler from 1993-2009, showed seven cases of bamboo node among patients with mixed connective tissue disease (MCTD). With the patient's consent, this case is presented to contribute to current knowledge about MCTD. A 36-year-old Filipino female developed voice hoarseness one year after she was diagnosed with MCTD. Videostroboscopic findings revealed bilateral bamboo nodes, vibratory defects, and amplitude abnormalities. Treatment with prednisone, methotrexate, hydroxychloroquine, along with voice rest and speech therapy resulted in normalization of amplitude, mucosal wave and vibratory behavior during repeat videostroboscopy. To date, this is the first known case of bamboo nodes associated with MCTD in a Filipino patient. This case highlights the importance of properly investigating the symptom of hoarseness among patients with rheumatologic diseases. A multidisciplinary approach involving the rheumatologist, otorhinolaryngologist, and speech therapist play an important role in the complete care of this patient.

Keywords: *Bamboo nodes, Dysphonia, Mixed connective tissue disorder, Filipino, Case report, Medicine*

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NP

Basal cell carcinoma of the vulva: a rare case in the postmenopausal woman

Luna, Jericho Thaddeus P. , Señeris, Aubrey Y.

Basal cell carcinoma (BCC) is a rare tumor of the vulva because BCC is frequently seen in skin sites exposed to sun. Vulvar basal cell carcinoma accounts for < 1% of all BCCs and 2-5% of all vulvar carcinomas. The standard treatment for vulvar BCC is surgical excision and it produces good survival outcomes. This is a case report of an 83-year-old female who presented with a vulvar nodule associated with pruritus and bleeding. Initial vulvar biopsy revealed squamous cell carcinoma (SCCA). Patient underwent concurrent chemoradiation therapy for a Stage IIIB disease. Radical vulvectomy was subsequently done for tumor persistence. Surprisingly, the histopathology report of the persistent vulvar nodule revealed pigmented nodular basal cell carcinoma with lymphovascular invasion (LVSI). Patient was advised postoperative systemic chemotherapy but patient and relatives did not consent for the systemic treatment. Patient had no evidence of disease at 8 months post-surgery.

Keywords: *Basal cell carcinoma, Vulvar carcinoma, Medicine*

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NP

Beating the odds: a case report on the successful management of a non-immune hydrops fetalis due to hemoglobin Bart's disease

Abat, Marinella Agnes G. , Javier, Maria Jane Ellise S., Cheng, Maria Rosario C.

Hemoglobin Bart's hydrops fetalis, characterized by a deletion of all four α -globin genes is the most severe and lethal form of Thalassemia disease. Mortality rate usually ranges from 60-100% of cases. Given the poor overall prognosis, most countries resort to pregnancy termination or expectant management as the only options to offer affected pregnancies. This paper presents a case of the successful management of a primigravid, diagnosed with hydrops fetalis at 29 4/7 weeks age of gestation. She delivered successfully to a live, preterm, baby boy who was later found out to have hydrops fetalis due to Hemoglobin Bart's disease, and currently, continues to thrive past eight months of age. This report aims to improve the clinicians' knowledge regarding the work up and management of pregnant patients diagnosed with hydrops fetalis, and increase the clinician's awareness on the epidemiology, importance of targeted screening, and diagnosis of Alpha-Thalassemia in Filipino patients.

Keywords: *Alpha-Thalassemia, Hemoglobin Barts, Hydrops Fetalis, Philippines, Medicine*

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A before and after study on the effect of fetal acoustic stimulation test on non stress test parameters

Bautista-Zamora, Brenda Bernadette P. , Dela Rosa, Catherine Rose DG.

To determine the effect of Fetal Acoustic Stimulation Test on Non Stress Test Parameters. A total of 650 subjects (power of 80%) were enrolled. Subjects were both high risk and non high risk pregnancies, at more than 36 weeks AOG with normal AFI. All subjects underwent non stress test followed by non stress test with acoustic stimulation

test for minimum of 20-40 minutes. Once consent was obtained, a low frequency sound transducer (40 hertz) was applied on the maternal abdomen to provide acoustic stimulation. The data was gathered, analyzed and compared. Acoustic Stimulation Test improved the results of NST by having reactive results, longer duration accelerations, improved variability from minimal to moderate variability, and increased number of fetal movements. AST is not a standalone procedure but merely an adjunct to other antenatal tests for fetal surveillance such as BPS and Doppler.

Keywords: *Non stress test, Acoustic stimulation test, Low frequency sound transducer, BPS, Doppler, Medicine*

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NP

0372

Bicarbonate enhances the inflammatory response by activating JAK/STAT signalling in LPS + IFN- γ -stimulated macrophages

Kawakami, Tomoya , Koike, Atsushi , Maehara, Toko , Hayashi, Tetsuya

Macrophages, which develop by changing their functions according to various environmental conditions and stimuli, defend against the pathogens and play roles in homeostasis and disease states. Bicarbonate (HCO_3^-) is important in the maintenance of intracellular and extracellular pH in the body. However, the effects of bicarbonate on macrophage function have not been examined. In this study, we investigated the effects of bicarbonate on macrophage activation in lipopolysaccharide (LPS) and interferon (IFN)- γ (LPS + IFN- γ)-stimulated murine macrophage-like RAW264.7 cells. The expression of the interleukin (IL)-6, inducible nitric oxide (NO) synthase and cyclooxygenase-2 genes was enhanced by sodium bicarbonate (NaHCO_3) in a concentration-dependent manner in LPS + IFN- γ -stimulated RAW264.7 cells. The production of IL-6, NO^- and prostaglandin E2 was also increased by treatment with NaHCO_3 in these cells. Moreover, NaHCO_3 -mediated elevation of inflammatory gene expression was abrogated by solute carrier (SLC) transporter inhibitors. Furthermore, its NaHCO_3 -mediated activation was negated by a JAK inhibitor, tofacitinib. NaHCO_3 -enhanced phosphorylation of STAT1, and its enhancement was abrogated by pre-treating with SLC transporter inhibitors in LPS + IFN- γ -stimulated RAW264.7 cells. In addition, similar results were obtained in murine bone marrow-derived macrophages. These results indicate that bicarbonate enhanced the inflammatory response through the JAK/STAT signalling in LPS + IFN- γ -stimulated macrophages.

Keywords: *Bicarbonate, Inflammation, JAK/STAT, Macrophage, SLC transporter, Medicine*

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0373

Bilateral internal pudendal artery angiographic embolization of labial metastasis from gestational trophoblastic neoplasia

Soriano-Estrella, Agnes L. , Yap, Bernadette C.

Patients with Gestational Trophoblastic Neoplasia commonly experience bleeding from metastatic sites in the vulvovaginal area. Digital pressure and early institution of chemotherapy usually achieve control of the hemorrhage, but massive hemorrhage ensues in some cases. This paper documents the case of a 48 year-old Gravida8 Para7 (7017) who previously underwent total hysterectomy for endometrial mass. On histopathologic examination, it was diagnosed as Choriocarcinoma. Patient was then advised multiagent chemotherapy indicated for high-risk metastatic gestational trophoblastic neoplasia. Chemotherapy was discontinued due to intermittent,

profuse, vaginal bleeding that rendered the patient anemic, a contraindication to starting another cycle of chemotherapy. Despite direct pressure on the vulvar mass, the bleeding became intractable, rendering the patient hypotensive and hooked on ionotropes for hemodynamic stability. The only option remaining for the patient was emergency embolization. This paper documents the first embolization to be done in the Philippines for labial metastasis from gestational trophoblastic neoplasia.

Keywords: *Choriocarcinoma, embolization, Gestational trophoblastic neoplasia, Emergency angiographic embolization, Massive hemorrhage, Vulvovaginal metastasis, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 2, 27-31
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NP

0374

Breathlessly bleeding: a case report of catamenial pneumothorax

Lao, Susana Siy, Tan, Jonie C.

Catamenial pneumothorax is the monthly manifestation of air in the lungs that relates to menstruation. Main objective is to impart knowledge on the mechanism and management of catamenial pneumothorax in a patient with recurrent pneumothorax. We describe a case of catamenial pneumothorax with description, images and histopathologic evidence of the diagnosis. Standard treatment plan should be made for cases of catamenial pneumothorax.

Keywords: *Catamenial, Endometriosis, Pneumothorax, Medicine*

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NP

0375

Calcifying fibrous tumor of the jejunum in a 27-year-old primigravid: a case report

Masalunga, Marvin

The most common mesenchymal tumors of the gastrointestinal tract are gastrointestinal stromal tumors (GIST) and smooth muscle neoplasms; however, other soft tissue tumors may also present in the intestines and cause diagnostic dilemmas. We report the case of a 27-year old primigravid, with no known complications, who underwent cesarean section for cephalopelvic disproportion. Intraoperatively, a well-demarcated, solid mass measuring 1.5 x 1.0 x 0.7 cm was noted at the jejunum. The patient underwent segmental resection of the mass. Microscopic examination of the mass reveals a non-encapsulated, solid mass composed of bland spindle cells and dense, hyalinized collagen in whorls and bundles. Dystrophic calcifications and a lymphoplasmacytic inflammatory infiltrate are seen within the collagen bundles. Immunohistochemical staining with desmin, CD117, and DOG-1 was done, which are all negative. The case was signed out as calcifying fibrous tumor (CFT). Inclusion of CFTs in the differential diagnoses for mesenchymal tumors of the gastrointestinal tract is important, as these neoplasms are benign and have an excellent prognosis.

Keywords: *calcifying fibrous tumor, jejunum, neoplasms, fibrous tissue, Medicine*

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Carcinoid tumor arising in a mature cystic teratoma: a case report

Galang, Katherine Abegail P., Aquilizan, Leo Francis N.

This report will discuss a case of carcinoid tumor arising in a mature cystic teratoma in a 27-year-old single nulligravid, who initially consulted for primary amenorrhea and right lower quadrant pain. Pelvic ultrasound was done and revealed an ovarian cyst on the right, to consider mature cystic teratoma. She underwent right oophorectomy with unremarkable post-operative course. Furthermore, this case report will tackle the diagnosis, definitive management and prognosis of the condition.

Keywords: *Mature cystic teratoma, Carcinoid, Malignant Transformation, Nulligravid, Medicine*

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NP

Cardiovascular risk factors in Filipinos with rheumatoid arthritis included in the rheumatoid arthritis database and registry (RADAR)

Penserga, Kenneth Tee, Ester G. , Limgenco-Hipe, Juneth Ria R.

Rheumatoid arthritis (RA) is the most common autoimmune inflammatory arthritis of unknown etiology. Cardiovascular disease (CVD) remains a major problem for these patients. This paper aims to describe the presence of cardiovascular risk factors among Filipino patients with rheumatoid arthritis seen in the Philippine General Hospital Rheumatology outpatient department. This will also serve as a baseline database for patients with cardiovascular risk factors for future studies on the impact of rheumatoid arthritis on cardiovascular morbidity and mortality. Objective: to describe the presence of cardiovascular risk factors among Filipino patients with rheumatoid arthritis seen in the Philippine General Hospital Rheumatology outpatient department included in the Rheumatoid Arthritis Database and Registry (RADAR). Cases entered in the study were taken from the RADAR. Included patients were those worked up for traditional and non-traditional cardiovascular risk factors. Demographic data, traditional and nontraditional cardiovascular risk factors and management for RA and CVD were extracted. Descriptive statistics were applied. This study is approved by the Institutional Review Board. Ninety-eight patients were included in this study. Ninety four percent were female with mean age at diagnosis of 49.95 ± 10.17 (SD) years and mean disease duration of 63.01 months. For traditional cardiovascular risk factors: 18% were smokers; 34% (24/71) were obese; mean BMI was 23.85 ± 4.60 (SD) kg/m²; 39% (38/98) had hypertension of which 87% were on antihypertensive medication; 19% has impaired fasting glucose (IFG) or diabetes and 55% had dyslipidemia but only 53% and 33% were on oral hypoglycemic agents and statins, respectively. For non-traditional CV or disease related risk factors, 20% still had high disease activity and 65% had elevated sedimentation rate (mean 45.58 ± 18.36 (SD) mm/hr) on latest consult. Eighty seven percent were taking methotrexate but only three percent were on biologic agents. This study shows the presence of important traditional risk factors such as hypertension, diabetes, dyslipidemia, and obesity in this population. Significantly, more than half the cases have dyslipidemia. In addition, RA disease activity was high to moderate. The combination of traditional and disease related risk factors for cardiovascular disease is ominous and warrants aggressive treatment. In addition, patient education and weight control should be emphasized. It is recommended that this cohort be followed up prospectively.

Keywords: *Rheumatoid arthritis, Cardiovascular risk, Filipino patients, Medicine*

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NP

A case of ovotesticular disorder of sexual development (45 XO/46 XY: Mosaicism versus Chimerism)

Toral, Jean Anne B. , de Jesus, Ma. Sheryll R.

Ovotesticular disorder of sex development (OT-DSD), previously known as true hermaphrodite, is a rare disorder of sexual differentiation in which the gonads of an individual are characterized by the presence of both mature ovarian and testicular tissues. The diagnosis has traditionally been applied only if an individual has 1) histologically verified ovarian follicles or proof of their prior existence (e.g. corpora albicantia) and 2) seminiferous tubules or spermatozoa. This paper introduces you to a 14 year-old, who presented with primary amenorrhea and enlarging abdominal mass, underwent exploratory laparotomy, salphingoophorectomy, histologically diagnosed as a possible case of a true hermaphrodite and chromosomally diagnosed as 45XO/46XY who developed endodermal sinus tumor, a germ cell tumor, considered highly malignant.

Keywords: *Chimerism, Endodermal sinus tumor, Mosaicism, Ovotesticular Disorder of Sex Development (OT-DSD), True hermaphrodite, 45X/46XY, Medicine*

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NP

A case report of an uncommon extra-pulmonary tuberculosis presenting as an isolated tuberculous liver abscess in a 63-year-old immunocompetent male

Saturinas, Lucas Emir Sheikh R., Hernandez, Elfleda A.

Hepatic or liver tuberculosis is an uncommon form of extra-pulmonary tuberculosis which accounts for less than 1% of all tuberculous infections. Furthermore, tuberculous liver abscess (TLA), a subset of hepatic tuberculosis is extremely rare with a prevalence of 0.34% and is usually associated with foci of infection either in the lung, gastrointestinal tract, or an immunocompromised state. A case of a 63-year-old immunocompetent male, with no history of prior pulmonary tuberculosis, was initially diagnosed with pyogenic liver abscess and treated with empiric two-week therapy of Metronidazole 500mg/tab 1 tablet TID and Ciprofloxacin 500mg/tab 1 tablet BID. However, there was the persistence of right upper quadrant pain and jaundice despite compliance to therapy, hence admission. Initial antibiotics were re-initiated and subsequently underwent ultrasound-guided liver aspiration draining a thick, light brown abscess. Microbiologic cultures of the abscess turned out negative but AFB smear revealed 1+ on the AFB national TB program scale signifying 10-99 AFB seen/ 100 visual fields in at least 50 fields. Currently, there are no local treatment recommendations specific for isolated tuberculous liver abscess, thus was empirically started on 2HRZE/4HR for six months. On follow-up, the patient had no recurrence of liver abscess via a repeat ultrasound of the whole abdomen. This is an uncommon presentation of extra-pulmonary tuberculosis, an isolated tuberculous liver abscess in an immunocompetent male presenting with persistent right upper abdominal quadrant pain and jaundice. Despite the endemicity of tuberculosis in the Philippines, an isolated tuberculous liver abscess is uncommon or often overlooked. The excellent clinical prognosis of these patients with appropriate therapy necessitates timely diagnosis of this infrequent clinical entity and will prevent further unnecessary surgical interventions.

Keywords: *Tuberculosis, Extra-pulmonary tuberculosis, Liver abscess, Case report, Medicine*

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NP

A case report on catamenial epilepsy

Murao, Lara Jessica G., Penolio, Vaneza Valentina , Apepe, Emille Teresa

A case of a 17-year-old nulligravid with onset of seizure episodes since menarche is reported. She was diagnosed with Seizure Disorder treated with Phenobarbital and was seizure free for 2 years. Two years prior to consult, seizure recurrences were noted to coincide with menstruation, hence, was diagnosed with Catamenial Epilepsy. Patient was shifted to Lamotrigine but seizure exacerbations were still observed, prompting referral to the Reproductive Medicine service for adjunctive hormonal therapy. Depot medroxyprogesterone acetate was added to the antiepileptic drug which provided seizure control. Adjunctive hormonal therapy proved to be helpful in the management of intractable seizures in this patient. The report aims to give a better understanding of the neuroactive properties of estrogen and progesterone and its role in the development of Catamenial Epilepsy. Gender-related and psychosocial issues in the treatment of Epilepsy in the child-bearing years up to the menopause are also discussed.

Keywords: *Catamenial epilepsy, Seizure, Antiepileptic drug, Hormonal therapy, Medicine*

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(Filipiniana Analytics)
NP

A case report on ovotesticular disorder of sexual development 46, XY with malignant mixed germ cell tumor (yolk sac tumor, dysgerminoma, mature cystic teratoma)

Estuart, Darleen SJ. , Bonguyan, Tessa Mae J.

This paper reports a case of a 19 year-old born with ambiguous genitalia, who presented with abdominopelvic mass diagnosed to have Ovotesticular Disorder of Sexual Development (OT-DSD) 46, XY with Malignant Mixed Germ Cell Tumor (Yolk Sac Tumor, Dysgerminoma, Mature Cystic Teratoma.). She underwent two surgeries and had gone through six cycles of Vincristine, Dactinomycin and Cyclophosphamide chemotherapy. OT-DSD is a rare condition by the presence of both histologically proven testis and ovary in the same individual. The report describes the clinical, biochemical, imaging, and histopathologic findings and outcomes of OT-DSD complicated with gonadal tumor. Diagnostic work up, pre-operative preparations, intra operative management, post-operative follow up and chemotherapy along with psychiatric support for gender identity and assignment are discussed. This paper emphasizes the importance of multidisciplinary effort from the different fields of medicine namely reproductive endocrinology, gynecologic oncology, surgery, psychiatry, and anesthesiology.

Keywords: *46, XY disorders of sex development, Disorders of sexual development, Neoplasms, Germ cell and embryonal, Ovotesticular disorder of sexual development, Medicine*

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NP

A case report on primary cutaneous mucoepidermoid carcinoma of the vulva and its clinico-pathologic identity

Bagadiong, Jonalyn G. , Abrenica, Joan Kristel B., Cole, Lilli May

Mucoepidermoid Carcinoma (MEC) is an epithelial malignant tumor that was first described as a salivary gland malignancy. Though common in salivary gland, it is extremely rare in the vulva with only 2 cases reported in the English language literature and none yet in the Philippines. Due to its low incidence, prognosis and definitive management is still unclear. This is a case of a 68-year-old woman with a history of vulvar pruritus and vulvar mass at the left labia majora. Punch biopsy and review of slides revealed Invasive Squamous Cell Carcinoma, Non-Keratinizing type. She underwent Radical Vulvectomy and Bilateral Lymph Groin Dissection; Wide Excision of Perineal Area; Protective Transverse Loop Colostomy; Gracilis Myocutaneous Flap with Identification of Right and Left Median Circumflex Artery with a final histopathology report of Primary Cutaneous MEC of the vulva with lymph node metastasis.

Keywords: *Vulvar Carcinoma, Primary Cutaneous Mucoepidermoid Carcinoma, Medicine*

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(Filipiniana Analytics)

NP

Case report: Rosai-Dorfman disease, pelvic manifestation

Alday, Joanna Marie M., Cortez, Antonio C.

This is a case of a 51-year-old, Filipino, multipara, presenting with a five-month history of gradually enlarging pelvoabdominal mass. Initially assessed with multiple myoma, a total abdominal hysterectomy with bilateral salpingo-oophorectomy and excision of pelvic mass were done. Histopathology report of the mass showed Rosai-Dorfman Disease (RDD) and immunohistochemical stains, CD68 and S100, were both confirmatory. RDD within the pelvic cavity is an extremely rare occurrence with only seven reported cases globally on a wide-literature search. This paper describes the clinical presentation, imaging, management and histopathology of the case. The objective is to increase awareness on the pelvic manifestation of RDD and to provide health care professionals with additional knowledge for diagnosis and management of similar cases.

Keywords: *Case report, Extranodal, Pelvis, Rosai-Dorfman, Medicine*

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2018 November to December,

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NP

Two cases of uterine vascular malformations diagnosed by color doppler ultrasound and managed conservatively by uterine artery embolization

Nierva-Velante, Rosa , Delena, Mary Ann C.

Vascular malformations of the uterus are rare, but could be a cause of life-threatening profuse abnormal uterine bleeding. Most reported cases in the literature are the arteriovenous malformations (AVM's), arterio-venous (AV) fistulas or pseudoaneurysms. The true incidence is not yet known though they represent about 1-2% of all the genital and intraperitoneal hemorrhages. AVM is an abnormal connection between uterine arteries and veins while

pseudoaneurysm or false aneurysm is an extraluminal collection of blood with turbulent flow that communicates with the parent vessel through a defect in the arterial wall. Both conditions could cause profuse or torrential abnormal uterine bleeding after uterine surgery, manipulation, or cesarean section or any procedures that could cause injury to the uterus. Treatment options or modalities are similar for both. The treatment of choice whether conservatively or surgically depends on the symptoms, age, desire for future fertility, location and size of the lesion. Pelvic angiography is the gold standard diagnostic modality, though transvaginal ultrasound with color Doppler provides a valuable, non-invasive and readily accessible initial diagnostic procedure. Uterine artery embolization is the treatment of choice in symptomatic patients desirous of future fertility. We report a case of AVM after dilatation and curettage (D&C) for missed abortion and pseudoaneurysm after cesarean section (CS) which were initially diagnosed with transvaginal color Doppler ultrasound – as vascular malformation (AVM versus AV-fistula vs. Pseudoaneurysm), prior to angiography and successfully treated by uterine artery embolization.

Keywords: *Vascular Malformations, AV Malformation, Pseudoaneurysm, Abnormal Uterine Bleeding, Medicine*

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NP

0385

Cervical length measurement using an improvised cervicometer as a predictor of spontaneous preterm birth in uncomplicated pregnancies in a tertiary hospital in Southern Luzon in 2015: a cohort study
Burog, Honorata Lalaine P. , Mendoza, Melanie P.

Preterm birth is a major public health problem and cervical length measurement using transvaginal ultrasound is the gold standard for predicting its occurrence. However, its cost and the limited availability of equipment and trained sonologists has limited its use only for screening for high-risk patients and those with history of preterm birth. Those patients without risk factors are not recommended for routine screening although they constitute the majority of spontaneous preterm deliveries. The newly marked cervicometer, Cervilenz©, an easy-to-use and cheaper device, has been found to be comparable to transvaginal ultrasound in predicting preterm birth and may be used to universally screen all patients regardless of their risk status, however, at present, it is only available in the United States. This study aims to determine if an improvised cervicometer such as the insertion tube of an intrauterine device can also be used as a screening tool for predicting spontaneous preterm birth in uncomplicated pregnancies. The cervical length of 126 patients at 14 to < 37 weeks age of gestation were measured and patients were followed up until delivery. It was found that those with short cervical length of < 25mm were not an increased risk of preterm birth (p-value > 0.05 at CI 95%). The negative predictive value was found to be 100%, 95%, and 88% at < 32, <34, and <37 weeks, respectively, in which those with normal cervical length were less likely to deliver prematurely, and this finding is comparable to the outcome of Cervilenz© studies. An improvised cervicometer such as the insertion tube of an intrauterine device can be used as a screening tool for predicting spontaneous preterm birth in uncomplicated pregnancies.

Keywords: *Cervical length, Cervicometer, Premature, Preterm birth, Medicine*

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NP

Cervical pessary in prevention of preterm birth: a case series

Tabaquero, Mary Anne , Hernandez, Erika Gail G.

Preterm birth defined as birth between 20-37 weeks age of gestation, poses major concerns as it causes serious health problems. Across 184 countries, the rate of preterm birth ranges from 5% to 18% of babies born and the Philippines ranks 8th out of 184 countries for the number of babies born prematurely, and ranks 17th for the total number of deaths due to complications from preterm birth. Management of incompetent cervix as one of the causes of preterm birth is cerclage. However, pessary insertion is an alternative especially in cases where cerclage may not be employed. To date, there have been no local published reports on effectiveness of pessary in prevention of preterm birth. Hence this study aims to report on cases supporting the use of pessary in preterm birth. This is a case series of three patients with short functional cervical lengths (<2.5 cm) seen in ultrasound, managed with pessary insertion showing its effectiveness in prolonging pregnancy. In conclusion, pessary is an affordable and safe alternative management of preterm birth which may be employed in our setting. Future clinical trials may be helpful in strengthening this evidence.

Keywords: *Pessary, Preterm birth, Cervical incompetence, Medicine*

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NP

Cervicovaginal agenesis: a case report

Dichoso, Marian C., Sasuca, Kristine S.

Congenital absence of the uterine cervix and vagina in the presence of a functional endometrium is an extremely rare congenital anomaly. Women born with this anomaly present with collection of blood in the uterine cavity or hematometra, disabling pelvic pain and progressively worsening endometriosis. Presented is a case of a 16-year old girl with severe pelvic endometriosis and hematometra complicated by cervicovaginal agenesis. She was managed by total abdominal hysterectomy with bilateral salpingectomy, left oophorocystectomy and adhesiolysis. Surgical management of congenital cervicovaginal agenesis remains controversial. The decision to do a conservative surgical procedure or a hysterectomy depends on the clinical profile of the patient, the expertise of the surgeon, the extent of the malformation and its association with other Mullerian anomalies.

Keywords: *Cervicovaginal agenesis, Endometriosis, Hematometra, Mullerian anomalies, Medicine*

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2015 June,
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NP

Cesarean scar pregnancy “a rarity no more?” a report of 2 cases

Gamboa, Michelle E., Reyes, Lylah D., Reyes, Denise Elaine A., Torres, Romerico F.

Cesarean scar pregnancy is the rarest form of ectopic pregnancy. In the Philippines, little is known about its incidence and occurrence. However, increasing rates has been documented worldwide, closely related to the increasing cesarean section rates. This paper reports two cases of cesarean scar pregnancy who both presented with vaginal bleeding. The first case, a Gravida 6 Para 5 (5005), while the second case, a Gravida 3 Para 2 (2002). Both diagnosed early by ultrasonography but managed differently. The first case, managed by hysterectomy, while

the second case, managed conservatively by laparoscopic excision of the cesarean scar pregnancy. This paper intends to raise awareness of the increasing incidence of cesarean scar pregnancy, its pathophysiology, different options in the diagnosis and management. Prevention is the key to decrease the incidence of cesarean scar pregnancy. To achieve this, reducing the cesarean section rate should be the primary goal.

Keywords: *Ectopic pregnancy, Cesarean scar pregnancy (CSP), Cesarean section, Medicine*

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NP

0389

Chemoprophylaxis in the prevention of postmolar gestational trophoblastic neoplasia: a 5-year review

Lu-Lasala, Lynnette R. , Tan, Reyalu T.

Administration of chemotherapy to prevent postmolar gestational trophoblastic neoplasia was first implemented in the 1960's. However, its use has remained controversial. This study aimed to describe the effect of chemoprophylaxis in preventing progression of hydatidiform mole to gestational trophoblastic neoplasia among patients managed in a tertiary hospital in Davao City from 2011 to 2015. This retrospective cross-sectional study evaluated 123 cases of hydatidiform mole who were managed at a tertiary hospital in Davao City from the years 2011 to 2015. The patients' charts were retrieved to get the clinicodemographic profile, progression to gestational trophoblastic neoplasia, and occurrence of adverse effects secondary to chemoprophylaxis. Patients with rising or plateauing beta human chorionic gonadotropin titer were identified within the 3-year period from molar evacuation. Collected data were analyzed using frequency and percentage distribution. The mean age of the patients was 30.5 years, 24% of whom were noted in women more than 40 years of age. The average age of gestation on admission was 14.89 weeks. All patients had a histopathologic diagnosis of complete mole and at least one risk factor for developing postmolar gestational trophoblastic neoplasia. Patients did not experience any significant side effect to chemoprophylaxis. None of the patients developed gestational trophoblastic neoplasia within the 3-year period of monitoring. The administration of chemoprophylaxis to patients diagnosed with hydatidiform mole may be effective against the development of postmolar gestational trophoblastic neoplasia.

Keywords: *Chemoprophylaxis, Gestational trophoblastic neoplasia, Hydatidiform mole, Postmolar gestational trophoblastic disease, Medicine*

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0390

Choriocarcinoma of the colon: a rare case

Lu-Lasala, Lynnette R. , Tapodoc, Jannah A.

Gestational trophoblastic neoplasia is a group of tumors which includes invasive mole, choriocarcinoma, placental site trophoblastic tumor and epithelioid trophoblastic tumor, all of which develop after a recognized pregnancy. Choriocarcinoma is a highly invasive and metastatic neoplasm which arises in women of reproductive age. Local spread is reported at 15% while distant metastasis at 4%. Of the 4% of cases having distant metastasis, 60% goes to the lungs, 30% to the vagina, and 10% to other sites. Less than 5% of patients with metastatic gestational trophoblastic neoplasia have involvement of the gastrointestinal tract. This is the case of a 47-year-old multigravid patient who came in with an enlarging abdomen 8 years after she had a hydatidiform mole. Work-ups were done

which revealed metastases to the colon, liver and lungs. The plan of management was to give multiple agent chemotherapy.

Keywords: *Choriocarcinoma, Gestational Trophoblastic Neoplasia, Hydatidiform Mole, Gastrointestinal tract, Medicine*

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0391

Clinical profile and major adverse cardiovascular outcomes in patients who underwent coronary revascularization for left main coronary artery disease and left main equivalent coronary artery disease in a tertiary hospital

Tiongco, II, Richard Henry P. , Chua, III, Enrique M. , Aherrera, Jaime Alfonso M. , Taquiso, Jezreel L.

Percutaneous coronary intervention (PCI) for left main (LMCA) coronary artery disease (CAD) was found to be non-inferior and had similar major adverse cardiovascular events (MACE) to coronary artery bypass grafting (CABG). In the local setting, the clinical profile and MACE of patients who underwent either revascularization are, however, unknown. To determine the clinical profile and in-hospital MACE of patients who underwent revascularization (PCI or CABG) for LMCA and left main equivalent CAD. This is a prospective descriptive study. Clinical profile and in-hospital, 30-days and 90-days post revascularization MACE were determined. Thirty-seven (37) adults were included. Most were males, diabetics, dyslipidemics, smokers, with previous cardiovascular events and premature CAD. Hypertension was significantly prevalent in the CABG group (PCI=62.50% vs CABG=90.48%, $p=0.04$). Patients who underwent CABG mostly presented with stable angina ($p=0.0453$). The majority of the PCI (68.75%) was done as an emergent/urgent procedure, with clear indications for PCI (i.e. STEMI). In-hospital all-cause mortality was significantly higher in the PCI group (PCI=50% vs CABG=0%, $p<<0.05$). Patients with LMCA and left main equivalent CAD were mostly males and had traditional CAD risk factors. In-hospital mortality was significantly higher among the PCI group; however, those who underwent PCI were unstable and unlikely to be good surgical candidates for CABG.

Keywords: *Coronary artery disease, Left main coronary artery disease, Percutaneous coronary intervention, Coronary artery bypass grafting, Major adverse cardiovascular outcome, Medicine*

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0392

Clinical profile and outcomes of Filipino lupus patients with myocarditis in a tertiary hospital

Magno, Jose Donato A. , Zamora, Geraldine T. , Tiongson, Marc Denver A. , Remalante, Patricia Pauline M.

Myocarditis is a rare but serious complication of systemic lupus erythematosus (SLE). Existing literature on adult Filipino SLE patients with myocarditis is limited. This study aims to determine clinical characteristics and outcomes of myocarditis in Filipino patients with lupus. Review of medical records (between 2015 and 2017) of eight adult patients with lupus myocarditis in a tertiary government hospital was done. Clinical features, electrographic and echocardiographic findings, management, and outcomes were described. All patients were females with a mean lupus duration of 10 months at the time myocarditis was diagnosed. Half of them had severe lupus activity, mostly with concomitant hematologic activity (100%) and nephritis (75%). Echocardiography showed wall motion abnormalities in all patients, with 63% having global hypokinesia and 75% having moderate

to severe hypokinesia of the left ventricular wall. Treatment included methylprednisolone pulse therapy (88%) and high-dose steroids (13%). One patient died from cardiogenic and septic shock prior to receiving MPPT. Most patients (75%) were clinically improved at the time of discharge. Filipino patients with lupus typically present with myocarditis early in the course of the disease, with high disease activity and concomitant hematologic activity and nephritis. Outcomes are generally favorable with early immunosuppressive therapy.

Keywords: *Systemic lupus erythematosus, Lupus, Myocarditis, Filipino, Medicine*

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0393

Clinical profile and prognostic factors of mortality among adult tetanus patients in Cagayan Valley Medical Center: a cross-sectional study

Valencia, Jose Carlo B. , Dalanao, Evervic Joy G.

Tetanus remains a public health threat in developing countries and is associated with a high morbidity and mortality rate. There is paucity of published data regarding the management of tetanus in the Philippines, hence, the study was conducted to determine the demographic, clinical profile, and prognostic factors that are associated with mortality among adult tetanus patients admitted in Cagayan Valley Medical Center (CVMC). This is a retrospective study of patients who presented with a clinical diagnosis of tetanus, above 19 years old at CVMC between September 1, 2012 to October 31, 2018. A total of 194 patients were studied. The male to female ratio was 11:1. Majority of patients were aged > 40 years (68.56%), rural dwellers (88.66%), farmers (84.02%) and males (91.75%). Only 3.09% of patients had prior tetanus immunization. Most common antecedent injury is trauma (84.53%), most commonly due to punctured wounds (63.40%). All patients had generalized tetanus, and majority were admitted in moderate grade (68.56%). Most common manifestations were trismus (92.78%), spasms (84.02%), dysphagia (80.93%) and rigidity (68.04%). Complication rate is 64.43%. Mortality rate is 38.66%. Most common cause of death is acute respiratory failure. Poor prognostic factors determined by univariate analysis were age more than 40 years (OR=2.24, p-value=0.0160), incubation period less than seven days (OR=2.65, p-value= 0.0027), period of onset less than three days (OR=2.52, p-value=0.0150) , severity of disease (OR=17.35, p-value=<0.0001), need for ventilatory support (OR=22.20, p-value=<0.0001) and presence of complications (OR=2.96, p-value= 0.0013). In multivariate analysis, only need for ventilatory support is associated with mortality (OR=31.57, p-value=0.000). Mortality rate of adult tetanus in Cagayan Valley Medical Center is high. Therefore, health education is highly encouraged to promote awareness, specifically in immunization and basic wound management.

Keywords: *Tetanus, Clinical form, Complications, Treatment outcome, Prognostic factors of mortality, Philippines, Medicine*

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0394

C-Myc-activated long non-coding RNA PVT1 enhances the proliferation of cervical cancer cells by sponging miR-486-3p

Wang, Chang , Zou, Hao , Chen, Aiping , Yang, Hongjuan , Yu, Xinping , Yu, Xiao , Wang, Yankui

Cervical cancer is one of the most prevalent gynecological malignancies. Although the functions of long non-coding RNA (lncRNA) plasmacytoma variant translocation 1 (PVT1) and c-Myc in tumorigenesis have been

acknowledged, the roles of c-Myc and lncRNA-PVT1 in the proliferation of cervical cancer are still unclear. Our study is designed to demonstrate the regulatory network involving c-Myc and lncRNA-PVT1 in cervical cancer. Quantitative real-time PCR and western blot assays were performed in our research to estimate the expression levels of RNA and proteins. CCK8 assays were applied to demonstrate the viability of HeLa and SiHa cells. Immunofluorescence assay was then used to investigate the co-localization of lncRNA-PVT1 and miR-486-3p. Binding of c-Myc to the promoter region of PVT1 was identified by ChIP-assay. Functionally, upregulation of lncRNA-PVT1 enhanced the proliferation and viability of cervical cancer cells. Mechanistically, lncRNA-PVT1 sponged miR-486-3p and released its repression of extracellular matrix protein 1. Besides, c-Myc functioned as an activator of lncRNA-PVT1 and upregulated its expression by binding to the promoter of PVT1 in cervical cancer cells. lncRNA-PVT1 was upregulated by c-Myc and thus enhanced the proliferation of cervical cancer cells by sponging miR-486-3p.

Keywords: *Cervical cancer, Plasmacytoma variant translocation 1 (PVT1), Polymerase chain reaction, Medicine*

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0395

Colloid carcinoma of the cervix and endometrial adenocarcinoma: a case report of collision tumor

Uy-Abuan, Ali Anjelica, Tupas, Maria Lora C.

Collision tumors are defined by the co-existence of two or more tumors in the same or adjacent organs which are topographically and histologically distinct with minimal or no histological admixture. Collision tumors are rare but some have been reported in other organs, as well as the female genital tract. To define and explain the pathogenesis, histogenesis and management; as well as present previously reported collision tumors in different countries as well as in our local setting. This is a rare case of a 68-year-old nulligravid who complained of postmenopausal bleeding. Imaging studies revealed a uterine mass. Differential diagnosis non-neoplastic conditions and benign and malignant neoplasms. Radical Modified hysterectomy with bilateral salpingo-oophorectomy with frozen section and complete staging was performed. Histopathology revealed a coexistence of a colloid carcinoma of the cervix and endometrial adenocarcinoma. Collision Tumors are infrequent neoplasias, there are few reports about them in medical literature. Colloid carcinoma of the cervix is a rare subtype and few studies are reported in literature. Their prognosis is unknown since there are no previous similar cases. Colloid carcinomas present a histologic as well as clinical dilemma. Their histogenetic origin remains controversial and their rarity precludes determination of the best treatment options to improve survival outcomes.

Keywords: *Colloid carcinoma, Endometrial adenocarcinoma, Mucin, Tumors, Medicine*

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 NP

0396

Comparative efficacy of oral *Lactobacillus rhamnosus* (protexin) against metronidazole (flagyl) in the treatment of bacterial vaginosis: a randomized clinical trial

Roque, Rosendo R. , Go, Marianne Rose L.

Bacterial vaginosis (BV) is a very common gynecologic infection associated with a vast number of complications both in gynecologic and obstetric patients. One of the major concerns in its treatment is a high recurrence rate which was multifactorial and the choice of the suitable antimicrobial is important to decrease the treatment failure.

All gynecologic patients aged 18 years old and above in a tertiary hospital diagnosed with bacterial vaginosis according to Amsel's criteria. A total of 80 patients were randomly assigned into two groups; one group to receive oral Probiotics (Protexin) while the other group to receive Metronidazole. The patients will be followed up accordingly on Days 1, 3, 7 and 30 and will be graded according to Amsel's criteria. The primary endpoint of the study is the treatment of bacterial vaginosis based on the mentioned criteria. (Anukam, 2006). The results showed that there was a significant improvement in the character of the vaginal discharge based on the Amsel's criteria on Day 1 of treatment for the Metronidazole group (0/40; 100%, p value <0.001) and Day 3 for Oral Lactobacillus arms. (7/40; 20%, p value 0.01). The Metronidazole arm showed a significant improvement in the fishy odor on vaginal examination with addition of 10% KOH on day 1 (0/40; 100%, p value <0.001) and Day 3 for oral Lactobacillus (0/40; 100%, p value 1.00). Then vaginal pH was noted to be more acidic in the Metronidazole compared to the Protexin arm on Day 1 of treatment (0/40; 0% and 40/40; 100% p value <0.001 respectively). However, both groups had no significant difference of vaginal pH in Days 3-30 (0/40; 100% p value 1.0). There was a note of less number of recurrence rate under the Protexin arm after 30 days of treatment (5/40; 12.5% p value <0.001) as reflected in the decreased number of clue cells. The Metronidazole remains to be the standard treatment for Bacterial vaginosis. There was also faster recovery and clinical improvement in the character of the vaginal discharge, amount and smell based on the Amsel's criteria as early as Day 1 of follow-up; however, there was a small number of population with poor compliance resulting to higher recurrence rate which was evident on the 30th day of follow-up. The oral *Lactobacillus rhamnosus* showed advantage over Metronidazole due to lower recurrence rate of BV as noted on Day 30 of follow up.

Keywords: *Bacterial vaginosis, Oral lactobacillus, Metronidazole, Medicine*

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 NP

0397

Comparative study on the diagnostic accuracy of the different international ovarian tumor analysis (IOTA) predictive model in discriminating between benign and malignant ovarian new growths: logistic regression 1 and 2 (LR1 and LR2) and assessment of the different neoplasias of the adnexa (ADNEX) model

Espiritu-Concepcion, Marnie Ann, Reforma, Kareen N.

To compare the diagnostic accuracy of the International Ovarian Tumor Analysis (IOTA)- Logistic Regression 1 and 2 (LR1 and LR2) and the Assessment of Different Neoplasias in the Adnexa (ADNEX) model in discriminating between benign and malignant ovarian new growths. The study was a prospective validation study. It included all patients admitted at the Gynecology ward of the Philippine General Hospital for elective surgery for ovarian new growths. Demographic information and clinical data were recorded for eligible patients. Two-dimensional ultrasonography with Doppler studies were performed. Ovarian new growths were classified based on IOTA LR1, LR2 and ADNEX model. Correlation of the ultrasound findings with the histopathology report and final staging based on Federation of Gynecology and Obstetrics (FIGO) classification was done. Sixty-seven (67) patients were included in the final analysis. The mean age was 43 years old (range of 17-78). There were sixteen (16) nulligravid patients (22%). Eighteen (18) out of the 67 patients (27%) had malignant ovarian masses on histopathology. The IOTA LR1 had an area under the curve (AUC) of 0.96, sensitivity of 89% (95%CI, 74-100) and specificity of 92% (95%CI, 84-100). The IOTA LR2 had an AUC of 0.88, sensitivity of 61% (95%CI, 39-84) and specificity of 96% (95%CI, 90-100). The IOTA ADNEX had an AUC of 0.96, sensitivity of 89% (95%CI, 74-100) and specificity of 76% (95%CI, 63-88). Sensitivity and specificity of IOTA ADNEX for the diagnosis of specific malignant subtypes were as follows: Borderline, 80% and 76%, Stage I, 100% and 100, Stage II-IV, 86% and 100%. Accuracy values were not computed for the metastatic cancer since there was only one case seen. There was no significant difference in the accuracy values of IOTA ADNEX with or without CA 125. In conclusion, IOTA LR1, LR 2 and ADNEX models were all useful tools in discriminating between benign and malignant ovarian masses. IOTA LR1 had the highest accuracy in differentiating between benign and malignant ovarian masses.

Keywords: *Ovarian new growth, Ultrasonography with Doppler studies, IOTA LR1, LR2, ADNEX model, Medicine*

Comparing differential gene expression in chronic traumatic encephalopathy, Parkinson's disease, and bipolar disorder

De Los Reyes, Francia Victoria

Chronic traumatic encephalopathy (CTE) is a progressive neurodegenerative disorder that is defined, neuropathologically, by the presence of aggregated hyperphosphorylated tau in the neurons and astrocytes of the perivascular area that is located deep in the cerebral sulci. The lesion is associated with repetitive brain trauma, from the spectrum of asymptomatic subconcussive head injury to grossly identifiable features of concussion. Although the diagnostic neuropathology of CTE is well-characterized, the precise mechanism that causes this to occur in CTE is not yet clearly elucidated. The features of hyperphosphorylated tau in CTE is quite similar with Alzheimer's Disease (AD), as is the reduced expression of certain genes that are required to dephosphorylate tau, which is the putative culprit in the generation of amyloid aggregates and hyperphosphorylated tau. In comparison, Parkinson's Disease (PD) is a neurodegenerative disease that is caused by accumulation of misfolded alpha-synuclein (α -syn) that causes the formation of intraneuronal Lewy Body aggregates. The pattern of accumulation for α -syn involves the olfactory bulb and the gut with progressive involvement of the posterior part of the brain. Despite establishing the presence of two different intraneuronal inclusions for CTE and PD, contact sports associated with the clinical spectrum of CTE has been shown to present with Parkinsonian features along with dementia. Mood disorders has been reported to occur in patients with these neurologic conditions. Several studies have documented that patients had a previous experience of traumatic brain injury prior to the diagnosis of Bipolar Disorder (BD). A review of electronic literature suggested that having an earlier diagnosis of BD increased the likelihood of having a diagnosis of PD in the future. This research aimed to compare the over- and underexpressed genes in cases with Parkinson's Disease (PD), cases with Bipolar Disorder (BD), and cases with Chronic Traumatic Encephalopathy (CTE) versus normal controls. This was done to determine if parallel overexpression in certain genes may indicate the possible association at the level of gene expression. Identifying similar RNA sequence establishing gene expression may provide an insight to the relationship of the diseases in terms of pathobiological behavior. Determining the similar over- or underexpression pattern may provide an insight on the common pathobiologic mechanisms that may be the reason for the three disorders being associated by way of pre-morbid or co-morbid condition. Transcripts from the public domain archive of the NCBI SRA were identified for the RNA sequence (RNAseq) of interest using the search string "Chronic Traumatic Encephalopathy," "Bipolar Disorder," and "Parkinson." Only public domain transcriptome files of post-mortem brain samples labeled as RNAseq data extracted thru the Illumina platform that have a paired normal control were selected. A total of ten (10) cases for each disorder and thirty (30) normal subjects for control in the NCBI SRA RNAseq database with a whole exome sequence file that was available for public domain use was utilized for differential gene expression analysis. Among 21,122 identified genes from the RNAseq, the analysis was able to identify 26 genes exhibiting increased expression of up to >15 log2 fold change among cases with CTE, PD, and BD compared with normal controls. In contradistinction, only 6 well-described genes exhibited a decreased expression among cases with CTE and BD compared to normal controls. However, there were no identified genes that exhibited underexpression in cases with PD compared with normal controls. The identification of parallel gene overexpression among the CTE, BD, and PD groups with respect to structural integrity, cellular metabolism, homeostasis, and apoptosis may indicate a common pathway that have been initiated as part of the response to maintain tissue function or as a consequence of the underlying pathobiologic mechanism that caused the primary lesion.

Keywords: *differential gene expression, RNAseq, Chronic Traumatic Encephalopathy, Bipolar Disorder, Parkinson's Disease, Medicine*

A comparison between palpation method and Johnson's rule to estimate fetal weight in term singleton pregnancies with cephalic presentation in a tertiary hospital: a prospective cross-sectional study

Marcaban, Menabelle A., Ochoco-Sotto, Ma. Regale Noemi R.

Estimation of fetal weight through ultrasound or clinically, is important in the management of pregnant women. In low resource settings, where ultrasound is scarce, determination of the superior clinical method between Johnson's rule and palpation method is of significant value. The objective of this study was to determine the best clinical method in estimating fetal weight in term parturients in a tertiary government hospital. 140 term mothers with singleton pregnancies in cephalic presentation were included in this study. Fetal weight was estimated using both palpation method and Johnson's rule and compared to the actual fetal weight. Effects of body mass index (BMI), cervical dilatation, and engagement on the accuracy of both methods were evaluated using one-way ANOVA and test of proportions. The accuracy of both methods were calculated by mean absolute error and bias. Bland-Altman analysis was used to see limits of agreement and the mean difference between estimated fetal weight to actual birthweight. Mean estimated fetal weight (EFW) was 2846.39 ± 427.29 g by Johnson's and 2904.29 ± 372.79 g by palpation with a mean actual birthweight of 3028.30 ± 441.52 g. Using paired t-test, no significant differences were found in EFW by the two methods and actual birthweight. Palpation had more estimates that differed from actual by < 100 grams at 41.43% compared to 16.43% for Johnson's with $p < 0.001$. Lower bias (7.11%) was seen in palpation compared to Johnson's (12.09%) and with more precise estimates. Palpation method is more accurate and reliable than Johnson's rule. Clinical palpation is easy, cost effective, simple and should be considered as a diagnostic tool for fetal weight estimation especially in rural areas. The effect modifiers are cervical dilation for palpation and engagement for Johnson's. BMI has no effect in accuracy of estimates in both methods.

Keywords: *Estimated fetal weight, Johnsons rule, Palpation method, Medicine*

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Comparison of digital image analysis and conventional microscopy in evaluating erythrocyte morphology in peripheral blood smears

Yurralde, Erick Martin H.

The use of conventional microscopy still forms the basis for the morphologic evaluation of erythrocytes despite widespread use of automated tests in the hematology laboratory. This requires a considerable length of time and expertise, and have the potential of becoming a source of errors and delay in reporting. Advances in image processing and machine learning in recent years have shown acceptable performance characteristics and have promising applications in the diagnostic laboratory. Use of these newly-developed technologies can address the stated problems and provide an alternative approach in the microscopic analysis of erythrocytes. This prospective validation study compared digital image analysis using a machine-learning based image recognition algorithm with conventional microscopy performed by a trained microscopist, which served as the reference standard. Random deidentified anticoagulated peripheral blood samples submitted to the hematology laboratory were assessed. A total of 956 erythrocytes were evaluated after image processing using support vector machine and routine microscopy as classifiers of erythrocytes into three categories: size, central pallor, and shape. The tested software was able to achieve a strong level of agreement compared to conventional microscopy, having kappa values ranging from 0.81 to 0.86. Accuracy for size, central pallor and shape were 89.88%, 93.72% and 87.89%, respectively. The validated image recognition software is an acceptable diagnostic test in determining erythrocyte morphology in peripheral blood smears. Its integration can potentially minimize hands-on time and improve the diagnostic laboratory workflow.

Keywords: *erythrocyte morphology, digital imaging, microscopy, Medicine*

Comparison of intravenous oxytocin infusion versus intracervical dinoprostone followed after 6 hours by intravenous oxytocin infusion for labor induction in prelabor rupture of membranes: a randomized controlled trial

Rivera, Leah Socorro N. , Garcia, Maria Ines A.

A prolonged interval from prelabor rupture of membranes to delivery is associated with an increase in the incidence of maternal and neonatal morbidities and mortality. Various agents have been tested to improve the cervical Bishop score to expedite the delivery of the fetus and lessen the maternal and neonatal complications. To compare two protocols for labor induction in pregnant women with prelabor rupture of membranes (PROM). Subjects were recruited from the University of Santo Tomas Hospital (Private Division and Clinical Division). Pregnant women with a live, term, singleton fetus, cephalic presentation, a reactive Non stress test, who presented with PROM and a Bishop score of ≤ 5 , with no previous Cesarean section, or other uterine surgery. This is a two-arm superiority, open label, randomized controlled trial. Pregnant women with a live, term, singleton fetus, cephalic presentation, a reactive Non stress test, who presented with PROM and a Bishop score of ≤ 5 , and with no previous Cesarean section or other uterine surgery were randomly assigned to receive either intravenous (IV) oxytocin infusion or intracervical dinoprostone 0.5 mg gel followed 6 hours later by IV oxytocin infusion. Vaginal delivery within 24 hours of labor induction increased significantly with intracervical dinoprostone gel followed by IV oxytocin infusion (87% versus 61%; RR: 1.43; 95% CI: 0.99 – 2.06; $P < 0.044$). Comparable result was observed for nulliparous women included in the study population. The time interval from labor induction to active phase was significantly shorter in the dinoprostone-oxytocin group than in the oxytocin alone group (2.4 ± 2.1 versus 6.3 ± 1.4 hours; $p < 0.001$). The time interval from labor induction to delivery was also significantly shorter in the dinoprostone-oxytocin group (6.3 ± 1.5 versus 10.4 ± 1.4 hours; $p < 0.000$). Cesarean delivery rates were statistically similar in the dinoprostone-oxytocin and oxytocin alone groups (17% versus 40%; $p = 0.102$). The neonatal outcomes were comparable in both groups, except for birth weight. Intracervical dinoprostone 0.5 mg gel followed 6 hours later by an oxytocin infusion in term women presenting with PROM and an unfavorable cervix (Bishop Score of 5 or less) was associated with a higher rate of vaginal delivery within 24 hours, shorter time interval from labor induction to active phase of labor, and shorter time interval from labor induction to delivery, and no difference in maternal and neonatal complications was observed compared with oxytocin infusion alone.

Keywords: *Intravenous oxytocin infusion, Intracervical dinoprostone, Labor induction, Prelabor rupture of membranes (PROM), Medicine*

A comparison of maternal and perinatal outcomes and mode of delivery of twin and singleton gestations in a tertiary government hospital during a 10-year period

Yap, Bernadette C., Silao, Joyceline Noemi I.

Multiple gestations, including twin gestations are commonly associated with adverse maternal, perinatal and neonatal outcomes compared with singleton pregnancies. Its incidence has shown a significant increase over the last decades. A retrospective cohort study was made at the Department of Obstetrics and Gynecology by review of medical records of twin pregnancies and their neonates. The purpose of this study is to describe and compare

the outcomes of twin gestation against singleton pregnancies, in terms of the following: the presentation of the twin gestation, chorionicity, the mode and timing of delivery and fetomaternal complications. This study aimed to determine whether an association exists between the twin gestation and adverse perinatal outcomes. The study included singletons and twin gestations admitted at a tertiary government hospital admitting section within a ten-year period, 2006-2015. Confirmation of diagnosis of multiple pregnancies was obtained by ultrasound. This retrospective cohort study conducted at a tertiary government hospital included 228 singletons and 110 twin gestations in a ten-year period. Results showed women with twin pregnancies had a higher incidence of preterm labor and delivery. Compared to singleton pregnancies, complications of prematurity are not uncommon in twin gestations. This should encourage prenatal and antenatal care in women who have twin gestations. The incidence of preterm labor and delivery for twin gestation, relative to singletons, was high in the study. Twin gestations are 3-4 times more likely to present with preterm labor relative to singletons.

Keywords: *Multiple gestation, Twin gestation, Mode of delivery, Maternal morbidity, Neonatal morbidity, Medicine*

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0403

A comparison of the clinical outcome of late preterm neonates with versus without antenatal corticosteroids

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Preterm birth remains to be the largest cause of neonatal deaths worldwide. Improvement in preterm neonatal outcomes with antenatal corticosteroids (ACS) given to mothers at 24 to 34 weeks gestation who are at risk for preterm birth is well established. Nevertheless, the use of ACS in the late preterm, which comprises the majority of preterm births, remains an area of discussion. Recent international studies have recommended the use of ACS on the late preterm group. However, such studies in a low-income setting are lacking. Moreover, there has been no local studies and guidelines supporting the use of ACS in the late preterm. To determine the difference in late preterm neonatal outcomes between neonates of mothers given versus those not given antenatal corticosteroids. This was a cross sectional study done at a tertiary hospital on all singleton late preterm deliveries from 2016 to 2018. The population was divided into the no ACS and with ACS group. Data were presented in means and proportions. T test and Z test were used to determine the significant difference. Test statistic with p value less than 0.05 was considered significant. The need for intubation was higher in neonates without ACS compared to the those with ACS, whether the course was completed or not (p value=0.024). Furthermore, respiratory distress syndrome and need for surfactant was significantly higher in the no ACS group when compared to those who completed the ACS course (p value=0.024 and 0.044, respectively). Though, no significant difference was noted in the other neonatal outcomes (p values >0.05). ACS, whether completed or not, resulted in a lesser need for intubation. Furthermore, a complete ACS course results in a decreased risk of respiratory distress syndrome and need for surfactant among late preterm neonates.

Keywords: *Late Preterm, Antenatal Corticosteroids, Medicine*

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Comparison of the clinical response of high-risk and ultra high-risk gestational trophoblastic neoplasia to etoposidemethotrexate-actinomycin-cyclophosphamide-vincristine: experience at the Philippine General Hospital

Soriano-Estrella, Agnes L. , Bonggao, Jeejane A.

Recent studies have shown poorer outcomes for patients with prognostic score above 12. Authors have proposed categorizing these patients as ultra high-risk to emphasize the need for a different treatment regimen. This study was conducted to compare the clinical response of high-risk and ultra high-risk Gestational Trophoblastic Neoplasia (GTN) patients who were managed at the Philippine General Hospital, from January 1, 2010 to December 31, 2015, after receiving the EMACO regimen as first line treatment. All patients diagnosed with metastatic high-risk GTN who were managed at the Philippine General Hospital from January 1, 2010 to December 31, 2015 and given the EMACO regimen as first-line treatment were included in the study. Patients were divided into high-risk disease or patients with a WHO prognostic score of 7-11 and ultra high-risk disease or patients with WHO prognostic score of 12 and above. Using the Z-test on two proportion, treatment outcome between the two groups were compared. A total of 57 patients diagnosed with metastatic high-risk GTN were included in the study. Of these, 35 or 61% were classified as high-risk while 22 or 39% were ultra high-risk. The primary remission rate of the high-risk group was 89% compared to 77% for the ultra high-risk group. The difference was not statistically significant ($p=0.2542$). Out of the 57 patients included in the study, 48 patients achieved remission after being treated with EMACO. An additional 4 patients achieved remission after being shifted to EPEMA due to resistance to the first line agent. All patients were alive after one year of follow-up, giving a one-year survival rate of 91.2%. The result of this study showed a relatively higher remission rate for high-risk (89%) than ultra highrisk GTN (77%) with EMACO as first line chemotherapy regimen, but statistical analysis revealed no significant difference. This finding suggests that EMACO may still be used as first line regimen for ultra high-risk GTN to attain remission.

Keywords: *Gestational trophoblastic neoplasia, High-risk, Ultra high-risk, EMACO, Medicine*

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Comparison of the diagnostic accuracy of early screening for preeclampsia by NICE guidelines, ACOG guidelines and comprehensive first trimester screening using maternal characteristics, ultrasonographic findings and maternal serum biochemical markers in the prediction of the development of preeclampsia in a tertiary hospital

Javier, Maria Jane Ellise S., Gonzaga, Zarinah G.

Preeclampsia remains to be a major cause of both fetal and maternal morbidity and mortality, particularly in severe forms leading to preterm birth. There is a lack of consensus, however, on the preferred screening test for early diagnosis with the aim of reducing the prevalence and morbidity of the disease. To compare the performance of the comprehensive first trimester screening using maternal characteristics, ultrasonographic findings and serum biochemical markers, with the NICE and ACOG guidelines in predicting the development of preeclampsia. The study also aims to determine the compliance rate of clinicians in giving aspirin prophylaxis using the different screening tests. This is a retrospective, analytical, cross sectional study of all pregnant patients between 11 to 13 6/7 weeks referred for comprehensive first trimester screening for preeclampsia from January 2014 to January 2018. Maternal factors were assessed to determine the risk of preeclampsia using NICE guidelines, ACOG guidelines and comprehensive first trimester screening. The compliance on aspirin administration for high-risk patients was also determined. The outcome measure was diagnosis of preeclampsia and the detection rate (DR) of the three screening tests were compared. A total of 202 women were included in the analysis where 24 (11.9%), 11 (5.4%) and 13 (6.4%) developed preeclampsia, early-onset preeclampsia (EO-PE) and late-onset preeclampsia (LO-PE) respectively. The NICE and ACOG guidelines were able to detect preeclampsia with an accuracy of

76.73% (Sn 75%, Sp 77% PPV 30.5%) and 43.07% (Sn 83.3%, Sp 37.6% PPV 15.3%) respectively. The comprehensive first trimester screening was able to detect preeclampsia with an accuracy of 89.60% (Sn 83.3%, Sp 90.5% PPV 54.1%). EO-PE and LO-PE were detected with an accuracy of up to 97.2% using the comprehensive screening (Sn 90.9%, Sp 97.9% PPV 71.4%), compared with the NICE guideline (up to 74.26%, Sn 81.8%, Sp 73.8% PPV 15.3%) and the ACOG guideline (up to 39.6%, Sn 90.9%, Sp 36.6, PPV 7.63%). Compliance with the NICE and ACOG recommendation on aspirin administration was only 42.37% and 33.33%, respectively, and this increased to up to 62% when comprehensive first trimester screening was used. This study confirmed that the performance of screening for PE, and therefore appropriate selection of the patients that would benefit from prophylactic use of aspirin and closer surveillance, is by far superior if the comprehensive first trimester screening is used than the method advocated by ACOG and NICE.

Keywords: *ACOG Guidelines, Early-Onset Preeclampsia, Late-Onset Preeclampsia, NICE Guidelines, Preeclampsia, Preeclampsia screening, PAPP-A, PIGF, Medicine*

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0406

Comparison of the efficacy and patients' satisfaction of povidone iodine and commercially prepared guava extract feminine wash as an external genital antiseptic among women who underwent vaginal delivery with episiorraphy in a tertiary hospital: a randomized clinical trial

Ignacio, Josephine G., Co, Jennifer T.

One of the most common complications of episiotomy is infection. Most infections will resolve with local perineal care. Hence, episiotomy wound care is important. In preventing wound infection cleansing the vulva and external genital area with an antiseptic solution prior to, and several days after the procedure until the wound is healed is potentially beneficial. To compare the efficacy and patients' satisfaction of commercially prepared guava extract with povidone iodine as external genital antiseptic wash in women who underwent vaginal delivery and had episiorraphy in a Tertiary Hospital. There were 248 women who underwent episiotomy and randomized to the guava leaf extract (n=122) and povidone-iodine (n=126) feminine wash groups. Episiotomy wound infection rate between guava (0.81%) and povidone iodine (2.38%) feminine wash, was not significantly different (p=0.33). Occurrence of adverse event was lower in the guava leaf extract (1, 0.81%) as compared to povidone iodine (4, 3.17%) feminine wash group, but is not statistically significant (p=0.19). The mean patient satisfaction score for the guava feminine wash is 4.4 which was significantly higher than the mean score of those in the povidone iodine feminine wash which is 3.6 (p< 0.001). The efficacy in preventing episiotomy wound infection and rate of adverse reaction with the use of commercially prepared guava leaf extract is comparable with povidone iodine as an external genital antiseptic. With regards to patients' satisfaction and cost this was found to favor the use of commercially prepared guava leaf extract external genital wash.

Keywords: *Episiotomy, Wound infection, Guava leaf extract, Povidone iodine feminine wash, Antiseptic external genital wash, Medicine*

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Comparison of the efficacy of iron amino acid chelate and ferrous sulfate in the treatment of iron deficiency anemia among pregnant women seen at the out-patient department of a tertiary medical center on 2016-2017

Olivar, Joseph U. , Santiago, Ma. Agnes A., Reyes, Lylah D.

Anemia is a major global problem that affects women and prevalent during pregnancy. Effective management is needed to prevent adverse maternal and pregnancy outcomes. Ferrous iron salts are the preparation of choice and recommended for both prevention and treatment of iron deficiency anemia (IDA). However, most commonly available iron supplement are poorly absorbed, with gastrointestinal disturbances as side effect. To compare the efficacy of iron amino acid chelate and ferrous sulfate in the treatment of IDA among pregnant women seen at the out-patient department of a tertiary medical center. This study is a single blind randomized clinical trial which included women 18 to 40 years old, with singleton pregnancies diagnosed with IDA without any co-existing fetal and maternal complications seen at the Out-Patient Department. Forty-eight eligible participants were randomized, with 24 women allocated on each treatment arm who took their assigned treatment twice a day for 90 days. Hemoglobin, hematocrit, MCHC, MCV, RDW & serum ferritin levels were taken at baseline and monitored on days 30, 60 and 90 from initiation of treatment. Mean blood parameters between two treatment arms were compared on days 30, 60 and 90 post-treatment as well as the mean difference of blood parameters on days post-treatment from the baseline using T-test. Chi-square was used to compare adverse effects between two treatment arms. No statistically significant differences in the mean blood parameters on days 30 and 60 of treatment between Iron amino acid chelate and Ferrous sulfate. It was only on day 90 from initiation of treatment when there were a significantly higher hematocrit and MCHC and lower RDW in Iron amino acid chelate compared to Ferrous sulfate group. All of the CBC parameters on days 30, 60, and 90 post-treatment when compared to baseline level were significantly increased for both treatment arms. However, day 90 level of serum ferritin in the Iron amino acid chelate group significantly increased unlike those in ferrous sulfate group. Iron amino acid chelate is comparable to Ferrous sulfate in the treatment of IDA among pregnant women. Iron amino acid chelate was found to be superior to Ferrous sulfate in achieving optimum treatment response even at a lower dose with lesser adverse effects. Hence, better oral iron treatment tolerability, thereby, compliance to long-term therapy can be expected resulting to successful treatment outcome.

Keywords: *Iron deficiency anemia in pregnancy, Iron amino acid chelate, Ferrous sulfate, Hemoglobin, Hematocrit, MCV, MCHC, RDW, Serum ferritin, Medicine*

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Comparison of the efficacy of metronidazole and metronidazole plus probiotics capsule in the treatment of bacterial vaginosis among non-pregnant patients seen at the outpatient department of a tertiary hospital: A single blind randomized controlled trial

Reyes, Lylah D. , Co, Jennifer T. , Muñoz-Cruz, Mary Rose

Bacterial vaginosis (BV) is the most prevalent cause of symptomatic vaginitis. In the Philippines, prevalence of BV is at 28.16%. The mainstay for the treatment of BV is Metronidazole. Although antibiotic therapy has been shown to eliminate BV associated organisms, there is extremely high recurrence rate. To compare the efficacy of metronidazole and metronidazole plus lactobacilli tablet in the treatment of bacterial vaginosis among non-pregnant patients seen at the outpatient department of a tertiary medical center. The population included non-pregnant women ages 15 to 44 years old, with bacterial vaginosis diagnosed by Amsel's criteria and Nugent's scoring. The participants were randomly assigned to their treatment group, one is Metronidazole only and the other received Metronidazole plus Lactobacillus tablet. All participants followed up on day 8, 15, 22 and 56 from initiation of treatment resolution or persistence of symptoms and collection of vaginal specimen for gram stain and inquire on adverse effects. On day 8 of treatment, there were significantly more participant in the

metronidazole plus probiotic arm with an estimated lactobacilli count of more than 30/hpf as compared to metronidazole alone. On day 15 post treatment, there was no statistically significant difference with the estimated *Gardnerella vaginalis* count, lactobacilli count, presence or absence of malodorous vaginal discharge between the metronidazole plus probiotic and the metronidazole alone arm. With metronidazole plus probiotic group, the proportion of women with less than 30 per hpf *Gardnerella vaginalis* count and absent foul-smelling vaginal discharge were accounted among 100% of the participants from day 8 to 56 post treatment. The early reduction in the causative agent and symptoms can be attributed to an increase in the estimated lactobacilli count sustained until 56 days post treatment metronidazole plus probiotic. However, from day 15 to 22 and 56 post-treatment, the proportion of participants who had a nugent's score of less than 4 were greater for both the metronidazole plus probiotic (100%) and metronidazole alone (95%) arm, when compared to day 8 post-treatment. This finding for the metronidazole plus probiotic group is due to sustained reduction in the *Gardnerella vaginalis* count and increase in lactobacilli counts. Potentially, the metronidazole plus probiotic treatment was found to be more favorable in sustaining the normal flora and probiotic can be used as an adjunct may enhance the efficacy of metronidazole in the treatment of BV. Metronidazole plus probiotic and metronidazole only treatment are comparable in treating bacterial vaginosis. In terms of restoring and maintaining the normal flora, metronidazole plus probiotic appears to be more significantly efficacious. Probiotic in the form of lactobacilli is a promising adjunct to enhance the efficacy of metronidazole in the treatment of bacterial vaginosis.

Keywords: *Bacterial vaginosis (BV), Probiotic, Lactobacilli, Amsels criteria, Nugent score, Metronidazole, Medicine*

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0409

A comparison of the maternal and perinatal outcomes of pregnant patients who are euthyroid versus those with subclinical hypothyroidism treated with levothyroxine using different TSH cut-off levels

Bilocura, Imelda L. , Lim-Pacoli, Mae Rhea, Tan, Ceryl Cindy

In 2017, the American Thyroid Association (ATA) revised their guidelines that when trimester and assay specific TSH reference intervals is unavailable, a TSH cut-off of 4.0 mIU/L replacing the previously recommended 2.5-3.0 mIU/L may be used to define maternal hypothyroidism. It states that levothyroxine treatment is considered if anti-TPO levels are elevated and TSH is between 2.5 mIU/L and the trimester-specific upper limit. These recommendations are a major departure from our current practice because the local TSH trimester-specific reference interval is not applicable due to a different assay used and the anti-TPO result is not readily available. In this population-based study, we aimed to determine and compare the maternal and perinatal outcomes of pregnant women who are euthyroid (TSH 0.3-2.4 mIU/L) versus those with subclinical hypothyroidism at different TSH cut-off levels (TSH 2.5-4.0 mIU/L, TSH 4.0-10.0 mIU/L) treated with levothyroxine. This is a single-center, prospective cohort study conducted at Chong Hua Hospital, Cebu City from September 2017 to September 2018 where a total of 505 pregnant women qualified. The cohort was divided into three groups: the euthyroid group of 404 women with TSH 0.3-2.4 mIU/L as control subjects; 101 women with subclinical hypothyroidism treated with levothyroxine further subdivided into TSH level 2.5-4.0 mIU/L (81 women) and TSH level >4.0-10.0 mIU/L (20 women). These patients were followed through to delivery to document and compare the maternal and perinatal outcomes versus euthyroid patients. There was no statistically significant difference among the group of patients with subclinical hypothyroidism treated with levothyroxine versus euthyroid patients in documented complications of pregnancy, such as GDM, gestational HPN, pre-eclampsia, PROM, low APGAR score and fetal distress. However, in patients with baseline TSH 2.5-4.0 mIU/L there was preterm delivery in six (7.41%) patients, post-term delivery in two (2.5%) patients, with seven (8.6%) small for gestational age (SGA) infants and two (2.5%) large for gestational age (LGA) infants. In patients with baseline TSH > 4.0-10.0 mIU/L, preterm delivery occurred in two (10%) patients. In secondary analysis adjusted for age and parity at enrolment, pregnant women treated with levothyroxine at baseline TSH 2.5-4.0 mIU/L and TSH > 4.0-10.0 mIU/L versus the untreated women with TSH < 2.5 mIU/L showed no difference in the maternal and perinatal outcomes of pregnancy measured. This study has shown a 12.5% prevalence of subclinical

hypothyroidism in our setting. There was no difference in the maternal and perinatal outcomes of pregnant patients who are euthyroid versus those with subclinical hypothyroidism treated with levothyroxine at a TSH threshold of 2.5-4.0 mIU/L and >4.0-10.0 mIU/L. These findings support the view that levothyroxine treatment in pregnant women with subclinical hypothyroidism at a TSH cut-off of 2.5 mIU/L shows no harmful effects.

Keywords: *Pregnancy, Subclinical hypothyroidism, Treatment outcome, Medicine*

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0410

Comparison of the operative and post-operative outcome between episiorrhaphy with and without application of policresulen solution

Rey-Matias, Christian Joanna B. , Reyes, Lylah D. , Patetico, Ashmeir Q.

Episiotomy is a surgical incision of the perineum performed to widen the vaginal opening to facilitate the delivery of an infant. Bleeding is its common complication. A certain technique must be followed so as not to incur either dyspareunia, dehiscence or infection. Hence the application of policresulen solution during repair may minimize bleeding and facilitate better wound healing. To compare the operative and post-operative outcome between episiorrhaphy with and without application of policresulen solution during repair among puerperal patients admitted in a tertiary hospital. One hundred participants were randomized to two treatment groups. Those assigned to treatment A (n=50) underwent episiorrhaphy with policresulen solution application while those in treatment B (n=50) served as the control group. The main outcome measures were estimated blood loss, operative time and duration of wound healing. There was a significantly shorter mean operative time with the participants in the Policresulen group (20.92 ± 0.90 minutes) as compared to the Control group (53.8 ± 1.79 minutes) with a P-value of < 0.001 . Estimated mean blood loss was significantly lesser in the Policresulen group (195.2 ± 5.69 ml) than in the Control group (373.8 ± 16.14 ml) having a P-value of < 0.001 . The duration of wound healing was also shorter among those in the Policresulen group (1.42 ± 0.09 weeks) than those in the Control group (2.14 ± 0.17 weeks), with a P-value of 0.003. A significantly greater proportion of participants had shorter operative time, lesser blood loss and shorter duration of wound healing in the policresulen group. (p-value < 0.005) Policresulen solution application has a good hemostatic effect on the episiotomy wound hence shortened the operative time. It also has a good wound healing effect reflected by a shortened duration of wound healing of the episiotomy wound.

Keywords: *Policresulen solution, Episiotomy, Blood loss, Operative time, Wound healing, Medicine*

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0411

Comparison of the prevalence of hypertension using three proposed classifications in a single center primary prevention setting

Vilela, Gerald C. , Yap, Emily Mae L., Valenzuela, Rhalp Jaylord L.

The American College of Cardiology/American Heart Association (ACC/AHA) revised the thresholds for the definition and treatment of hypertension that was recommended by the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) while the 2018 European Society of Cardiology/European Society of Hypertension (ESC/ESH) Guidelines for the Prevention, Detection, Evaluation, and Management of High Blood Pressure retained their previous classification but revised the recommendations for diagnosis and treatment. The impact of these changes in our setting is uncertain. This

study aims to compare the prevalence of hypertension using the three proposed criteria in a primary preventive setting. This is a cross-sectional analytical study using data at the Primary Preventive Cardiology Clinic of the Philippine Heart Center from January 1, 2002 to December 31, 2017. There were 2,082 patients in this study. The mean age is 57.1 ± 10.9 years with a female predominance (72.5%). Most of the patients were married (67.3%, 1,401) and unemployed (67.1%, 1,398). Comorbid illnesses include dyslipidemia (48.2%) and type 2 diabetes mellitus (20.3%). The prevalence of hypertension using the JNC 7 and the 2018 ESC/ESH blood pressure (BP) classification was 56% (n=1,167). When the 2017 ACC/AHA BP classification was applied, there was a significant increase in the prevalence of hypertension to 80.3% (n=1671) ($p < 0.001$) demonstrating an absolute increase of +24.2%. The study shows a high prevalence of hypertension which further increased when the 2017 ACC/AHA BP classification was applied. This can impose a significant public health burden that needs to be addressed to prevent or decrease hypertension-related complications. Use of the new guidelines may affect diagnosis and treatment of hypertension with potential cost implications.

Keywords: Hypertension, Prevalence, Filipinos, Primary prevention, Medicine

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0412

Complete excision of a rare case of subependymal giant cell astrocytoma (SEGA) in tuberous sclerosis complex

Pagar, Norman D., De Guzman, Maria Anna, Go, Criscely L.

Subependymal giant cell astrocytoma is a rare tumor that occurs in the walls of the lateral ventricles, foramen of Monro, and less frequently, in the third ventricle. It is one of the intracranial lesions found in tuberous sclerosis complex (TSC) – a rare multisystem genetic disease. We present a rare case of an adult Filipino with cutaneous signs of TSC, who initially presented with signs of increased intracranial pressure. The patient underwent right frontal craniotomy, endoport-assisted excision of the tumor with insertion of a ventriculoperitoneal (VP) shunt. Histopathology was consistent with a subependymal giant-cell astrocytoma WHO grade 1. The general status of the patient improved thereafter – there was the relief of headache and improvement in vision and gross hearing. Subependymal giant cell astrocytoma is a rare tumor of the central nervous system especially in adults, whose diagnosis is based on clinical, radiological, and histological, and immunohistochemical stains. It should be included in the differential diagnosis of a mass near the foramen of Monro. Given the hereditary nature of the disease, genetic counseling is essential when encountering patients with this condition.

Keywords: Subependymal giant cell astrocytoma, Tuberous sclerosis complex, Filipino, Adult, Case report, Endoport-assisted excision, Medicine

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0413

Complete hydatidiform mole with co-existing live fetus: a case report

Lagare, Jezzel Joice G., Lu-Lasala, Lynnette R.

The co-existence of a hydatidiform mole with a living fetus during the third trimester is extremely rare. The optimal management of such a case is controversial especially when medical and obstetric complications set in before term. The aim of management is towards avoidance of complications and planning the delivery at the most appropriate time to ensure good maternal and fetal outcome. We report the case of a 27-year-old Gravida 2 Para

1, who was diagnosed with a complete mole with co-existing live fetus at around 12 weeks age of gestation. She was referred to our institution at 31 weeks and 1 day age of gestation due to vaginal bleeding for which an emergency cesarean section was done. She delivered a live baby boy weighing 1.5 kg, with Apgar Score of 4,6,6. Chemoprophylaxis was administered and her serum beta human chorionic gonadotropin was monitored postpartum.

Keywords: *Molar pregnancy, Complete mole, Hydatidiform Mole, Twin Pregnancy, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 44 Issue No. 4, 25-28
2020 July to August,
(Filipiniana Analytics)
NP

0414

Concurrent term pregnancy and choriocarcinoma: a case report *Dueñas, Rommel Z. , Cabanag, Paula B.*

Term pregnancy with choriocarcinoma is a rare entity and cases where both the mother and fetus survive are even more rare. This paper discusses the case of a term pregnancy with a concomitant choriocarcinoma in a 21 year old, gravida 2 para 0, who presented with hematochezia on the third trimester. She delivered via cesarean section for non-reassuring fetal status with good neonatal outcome. She underwent exploratory laparotomy postdelivery due to profuse gastrointestinal bleeding associated with deteriorating hemodynamic status. Histopathologic report revealed Ileal Choriocarcinoma. Metastatic work up showed liver and lung metastasis. The patient achieved remission after 8 cycles of EMACO chemotherapy. There was no evidence of recurrence in the subsequent 10 months of regular follow up.

Keywords: *Chemotherapy, Choriocarcinoma, Gastrointestinal hemorrhage, Hematochezia, Pregnancy, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 44 Issue No. 4, 19-24
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(Filipiniana Analytics)
NP

0415

The constitutive high-affinity Met-binding site in the kringle domain is dispensable for the signalling activity of hepatocyte growth factor

Umitsu, Masataka , Sakai, Katsuya , Tamura-Kawakami, Keiko , Matsumoto, Kunio , Takagi, Junichi

Activation of a tyrosine kinase receptor Met by hepatocyte growth factor (HGF) requires binding of proteolytically activated, two-chain (tc) HGF, but the biochemical detail of this ligand–receptor interaction specificity remains elusive because biologically inactive single chain (sc) HGF can also bind to Met with high affinity. We found that this proteolysis-independent Met binding can be eliminated by mutagenesis introduced in the kringle domain without losing the ability to bind and activate cellular Met receptor after proteolytic activation, arguing against this site's involvement in the physiological signalling. This non-signal producing Met–HGF interaction can also be eliminated by addition of a heparin mimetic sucrose octasulphate (SOS). By including SOS in the running buffer, we succeeded in detecting cleavage-dependent tcHGF–Met complex formation by size exclusion chromatography.

Keywords: *Hepatocyte growth factor, Kringle domain, Ligand/receptor interaction, Met receptor, Size exclusion chromatography, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 6, 577-586
2020 June,

0416

Contraceptive use and factors associated with unmet need for family planning among postpartum women admitted in a tertiary hospital

Argel, Jay Ian R., Germar, Maria Julieta V.

Unmet need points to the gap between reproductive intentions and contraceptive behavior. This cross-sectional study aims at determining the demographic, socioeconomic and other factors underlying the unmet need for contraception among postpartum women. A face-to-face interview was conducted to among postpartum women admitted in a tertiary hospital and logistic regression analysis was performed to determine the significant predictors of unmet need for family planning. Descriptive analysis on their contraceptive use was also determined. After controlling for other respondents' characteristics, the results indicate that the total unmet need was associated with younger women, those who were in the age range 20-30 years old during their first pregnancy and religion is Roman Catholic. The most significant association was shown in those whose partners disapprove the use of family planning. Majority have heard of contraception but are not using any method. The major sources of contraceptives and contraceptive information on family planning are still the public health sector. Most have contraceptive plans and they prefer oral pills and implants. Unmet need for family planning is associated with partner's approval. With low family planning utilization among postpartum women, future programs on family planning should focus on these problems.

Keywords: *Unmet Need, Postpartum, Family Planning, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 44 Issue No. 3, 1-11
2020 May to June,
(Filipiniana Analytics)
NP

0417

Cor pulmonale secondary to pulmonary tuberculosis in pregnancy: a report of two cases

Valera, Pamela Grace V., Reforma, Kareen N.

Cor pulmonale is defined as alteration in structure and function of the right ventricle of the heart caused by a primary disorder of the lungs. Presented are two cases of gravidocardiac patients from cor pulmonale secondary to multi-drug resistant tuberculosis. The first case is a case of a 37-year-old gravida 4 para 3 (3-0-0-3) and the second case is that of a 24-year-old primigravid, both of which were on their third trimester with no known cardiac disease, both initially presenting with dyspnea and heart failure symptoms. The first patient was not in labor, managed conservatively and was discharged clinically improved; the latter was delivered abdominally who later succumbed to fatal arrhythmia. Presented are the strategies in management and challenges encountered in managing a pregnant cardiac patient from cor pulmonale, specifically from pulmonary tuberculosis.

Keywords: *Cor pulmonale, Pulmonary heart disease, Pregnancy complications, Cardiovascular, Pulmonary tuberculosis, Medicine*

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2020 September to October,
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NP

Correlation of grayscale combined with color doppler sonography from histopathology in predicting retained products of conception

Komiya-Padilla, Jeptah, Go-Suva, Leilani

Retained products of conception can be troublesome complications following miscarriages. Ultrasound has a significant impact in their diagnosis and with the advent of color doppler sonography can improve the assessment. The goal of this study was to evaluate the use of grayscale combined with color Doppler ultrasound findings and correlate with histopathology in predicting retained products of conception in a maternity hospital. This was a cross sectional prospective study of 109 patients who underwent transvaginal grayscale ultrasound with color Doppler to evaluate the presence of retained products of conception. Resistance index(RI) is measured in Pulsed doppler to assess the impedance of blood flow. The standard criterion was the histopathologic reports obtained during completion curettage. Histopathologic results validated the presence of immature placental tissues in 93 (85%) patients and decidua in 16 (15%). Endometrial mass was greater with positive histopath results ($p<0.05$). Endometrial mass had a sensitivity of 83.9% in detecting retained products of conception. Thickened endometrium was detected in 71.4 % of women with positive histopath results, but only in 28.6% with negative histopath results. Color flow was confirmed in 85% with positive histopathology results. The combination of an endometrial mass with vascular pattern had the highest positive predictive value in determining retained products of conception.

Keywords: *Retained products of conception, Miscarriages, Decidua, Color Doppler sonography, Grayscale sonography, Pulsed Doppler, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 3, 22-30
2019 May to June,
(Filipiniana Analytics)
NP

Correlation of tumor-associated leukocytes with prognosis of colorectal carcinoma based on pathologic stage

Tindoc, John Anthony

To perform a pilot study investigating the presence of correlation between the different mean tumor-associated leukocyte counts and the prognosis of colorectal cancer based on pathologic stage. A cross-sectional study design, involving colorectal carcinoma cases in the Philippine General Hospital from 2015-2016. Proportional allocation stratified random sampling was done, with pathologic stage (AJCC 7th Edition) as the stratifying variable, collecting a total of 59 samples. Tissue sections from the samples were evaluated for the different tumor-associated lymphocyte counts. Correlation coefficients were computed to determine their correlation with pathologic stage as surrogate marker for prognosis. Of the myriad populations counted within and around the tumor mass, total lymphocyte, cytotoxic T-cell (CD8+ T-cell), neutrophil, macrophage, and plasma cell populations have significant correlation with pathologic stage as surrogate marker for prognosis of colorectal carcinoma. The immune system appears to have a significant role in the natural history of colorectal carcinoma. The tumor-infiltrating lymphocytic population and especially the CD8+ T-cell subset, neutrophils, and macrophages are correlated with better prognosis. The same observation can be seen with the peritumoral CD8+ T-cells, neutrophils, macrophages, and plasma cells.

Keywords: *colorectal adenocarcinoma, tumor-infiltrating lymphocytes, peritumoral leukocytes, prognosis, Medicine*

Philippine Journal of Pathology, Volume No. 4 Issue No. 2, 24-30
2019,
(Filipiniana Analytics)

Creation of a scoring system to determine endometrial cancer risk using the international endometrial tumor analysis (IETA) features

Gorgonio, Nephtali M. , Sigue, Airen J. , Mendoza, Sharon Joyce P.

To determine endometrial cancer risk among patients with abnormal uterine bleeding based on the International Endometrial Tumor Analysis (IETA) features. Specifically, to describe the profile of patients with AUB suspected of having endometrial pathology; to describe sonologic features of patients with AUB suspected of endometrial cancer using IETA features; and to determine the association of a scoring system and endometrial cancer risk. We prospectively studied 542 participants who came in the CWCU of CSMC with a diagnosis of AUB from July 1, 2016 to December 31, 2016. We excluded patients with endometrial thickness of less than 4 mm on gray-scale sonography, those with technical difficulties in assessing the endometrium such as in cases of very large myomas, absence of histopathological diagnosis, and those whose sampling was done as an office procedure. A total of 98 participants were included, 89 (90.8%) had benign pathologies and 9 (9.2%) were malignant. Patient characteristics including, age, gravidity, BMI, medical history, and endometrial assessment using IETA were tabulated with each characteristic given a score of 0-3 depending on the degree of risk factor. Percentages, Pearson Chi-square Test with corresponding P-value and ROC curve analysis were performed. The best predictors for endometrial cancer were age more than 50 years, nulligravid, BMI of more than 25, and presence of hypertension and diabetes mellitus. Sonographic features based on IETA showed an endometrial thickness of more than 20 mm, irregular endometrial-myometrial junction, heterogenous endometrium, presence of multiple and large vessels on doppler analysis, contributed to endometrial cancer risk. These variables were used to create a scoring system with an area under the curve of 0.974 giving the best cut-off value of more than or equal to 9, with 100% sensitivity and 89% specificity. Among patients with abnormal uterine bleeding and endometrial thickness of more than 4mm, we can predict the risk for endometrial cancer and aid the clinician in decision making on who may be managed conservatively or aggressively based on the value obtained from the scoring system. The study, however, needs to be validated prior to use in clinical practice.

Keywords: *AUB, Endometrial pathology, Colon stone, IETA, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 4, 9-17
2017 July to August,
(Filipiniana Analytics)
NP

Cross-contamination in molecular diagnostic laboratories in low- and middle-income countries: a challenge to COVID-19 testing

Albano, Pia Marie S. , Notarte, Kin Israel , Macaranas, Imee , Maralit, Benedict

At the start of the pandemic, the Philippines had to send swab samples to the Victorian Infectious Diseases Reference Laboratory in Melbourne, Australia for COVID-19 confirmation. With the increasing number of suspected cases needing confirmatory diagnostic testing, there was a demand to rapidly expand the capacity for widescale testing. Remarkably, within 200 days from announcement of the first confirmed COVID-19 case in the Philippines in January 30, 2020, the country has been able to expand its testing capacity from one national reference laboratory, the Research Institute for Tropical Medicine (RITM), to more than 100 licensed reverse transcription-polymerase chain reaction (RT-PCR) and cartridge-based PCR laboratories across the country. Due to the shortage of a trained clinical laboratory workforce, diagnostic centers are forced to hire additional personnel who have limited experience and technical knowledge and skills of molecular assays, especially in processing specimens, interpreting the results, identifying errors, and troubleshooting, in order to meet the demand of increased testing. Thus, the vulnerability to diagnostic errors, including cross-contamination, is increased and with the tendency for generating false positive results that can compromise the health of the patient and disrupt the efficacy of public health policies and public health response, surveillance programs, and restrictive measures for containing the outbreak. Hence, this review article aims to present the different sources of contamination in the laboratory setting where RT-PCR assays are conducted, as well as provide efficient, effective and feasible

solutions to address these issues, most especially in low- and middle-income countries (LMICs) like the Philippines.

Keywords: *SARS-CoV2, LMICs, RT-PCR, cross-contaminations, quality control, diagnosis, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
(Filipiniana Analytics)

0422

Descriptive analysis of the adherence to the acute care protocol for adult female sexual abuse patients seen at the OB admitting section in a tertiary public hospital in the Philippines

Jose, Stella Marie L. , Mendoza, Irish T.

Hepatitis B infection on pregnancy has been linked to preterm labor, risk of prematurity, low birth weight, and the occurrence of gestational diabetes mellitus. To determine the association between Chronic Hepatitis B infectivity and fetomaternal outcome such as preterm birth, low birth weight, gestational diabetes and preeclampsia among pregnant patients admitted in a Tertiary Hospital. A retrospective cohort study was done among pregnant women diagnosed with chronic hepatitis B infection admitted in a tertiary hospital from January 1, 2014 to December 31, 2018. The association of Hepatitis B infectivity and fetomaternal outcomes namely preterm birth, gestational diabetes, preeclampsia and low birth weight was determined. Chronic Hepatitis B infection had 1.43% prevalence among the study group. 149 patients were able to fulfill the inclusion criteria. Pregnant women with high infectivity Hepatitis B infection tend to be younger, have lower BMI, have lesser gravidity and parity than patients who are nonreactive to Hepatitis B e-antigen. AST and ALT were also higher among those with high infectivity Hepatitis B. However, there was no significant difference among the two groups in terms of elevated ALT. There was no significant association between Hepatitis B infectivity and fetomaternal outcomes such as preeclampsia, gestational diabetes mellitus, preterm birth and low birth weight. There is no increased risk for patients with high infectivity for preeclampsia, gestational diabetes mellitus, and low birth weight. There appears to be an excess risk in the likelihood of preterm birth/labor among those women who have a high infectivity Hepatitis B infection during pregnancy. The prevalence of chronic hepatitis B infection among Filipino pregnant women admitted in a tertiary hospital was 1.43% from 2014 to 2018. There was no association between chronic hepatitis B infectivity and preeclampsia, Gestational diabetes mellitus. There seems to be an increased risk for HBeAg positive patients for preterm birth, preterm labor, and occurrence of low birth weight, but was not statistically significant in the study population.

Keywords: *Chronic hepatitis B infectivity, Fetomaternal outcome, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 44 Issue No. 2, 25-33
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(Filipiniana Analytics)
NP

0423

Determination of the microbiologic flora on the incision site among obstetric patients who underwent surgical skin preparation with either 10% povidone iodine or 4% chlorhexidine antiseptic solution prior to cesarean section in a tertiary hospital

Jose, Stella Marie L. , Cupino, Diana J.

To determine the microbiologic flora after surgical skin preparation of the incision site using either chlorhexidine or povidone iodine antiseptic solution prior to cesarean section among obstetric patients. This is a cross-sectional study of ninety-two (92) obstetric patients who were admitted for cesarean section. They underwent fishbowl lottery, wherein participants drew from a bag of folded stubs written chlorhexidine or povidone iodine, to

determine their distribution to either group. Forty-six (46) participants were distributed in each group. Skin cultures were obtained by the researchers from the incision site after surgical skin preparation using chlorhexidine or povidone iodine. Total of 92 participants enrolled in this study, 46 participants in chlorhexidine group and another 46 participants in povidone iodine group. There was no statistically significant difference between the 2 groups in terms of clinicodemographic characteristics. Out of the 92 participants, only one participant, under the povidone iodine group, showed a growth of 100,000 colony-forming units of *Enterobacter cloacae* and has no statistical significance in the growth of microbiologic flora after effective surgical skin preparation with either chlorhexidine or povidone iodine. This study showed that chlorhexidine and povidone iodine are both effective in eliminating microbiologic flora after surgical skin preparation prior to cesarean section. Povidone iodine is still a sound choice of antiseptic especially in low resource setting. Due to the descriptive nature of this paper, only assumptions that chlorhexidine and povidone iodine are comparable antiseptic solutions can be deduced from this study.

Keywords: *Cesarean Section, Chlorhexidine, Povidone Iodine, Surgical skin preparation, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 1, 9-15
2018 January to February,
(Filipiniana Analytics)
NP

0424

Development and pilot implementation of a ladderized biosafety training program in a specialty infectious disease hospital and research institute

Medina, Plebeian

Biosafety is the application of laboratory practices, use of safety equipment and implementation of procedures in laboratory facilities when working with potentially infectious microorganisms to protect not only the laboratory worker, but also the general public and the environment. Biosafety training specifically structured based on risk is vital to establish a safe working environment to reduce the risks of unintentional exposure and/or intentional release of infectious microorganisms. In 2016, a ladderized 3-step biosafety training program was established by the Research Institute for Tropical Medicine, a specialty infectious disease hospital and National Reference Laboratory in the Philippines. The training program includes 1) Biosafety 101, offered to all new RITM employees; 2) Applied Biosafety training, especially designed for laboratory personnel; and 3) Advanced Biosafety training, focused on developing Biosafety Officers and infectious disease outbreak responders. A 30% increase in awareness on biosafety has been achieved among participants of the first two steps of the program, with the third module to be implemented in 2017.

Keywords: *biosafety, biosafety training program, biosecurity, Medicine*

Philippine Journal of Pathology, Volume No. 2 Issue No. 1, 5-11
2017,
(Filipiniana Analytics)

0425

Diagnostic accuracy of conventional cervical cytology (Papanicolaou smear), liquid based cytology (LBC) and visual inspection with acetic acid (VIA) in detecting premalignant and malignant cervical lesions among Filipino women in a tertiary hospital

Madera, Jennifer O. , Rivera, Roxanne Uy

Cervical cancer screening can reduce both the incidence and mortality rates of the disease. This study aimed to assess the diagnostic accuracy of conventional cytology, liquid based cytology and visual inspection with acetic acid in detecting pre-malignant and malignant cervical lesions. There were 249 patients who participated in the study. Of these, 6/249 (2.4%) turned out positive in papsmear, 7/249 (2.8%) turned out positive in liquid based

cytology while 23/249 (9.2%) turned out positive in visual inspection with acetic acid. Colposcopic guided cervical biopsy was done on all 249 patients to confirm the results. Fourteen turned out positive for cervical intraepithelial neoplasia, 1 patient had carcinoma in situ and 1 was positive for squamous cell carcinoma. Among the three screening tests, VIA appears to be the most accurate, followed by liquid based cytology as compared to the conventional papsmear.

Keywords: *Cervical Cancer Screening, Papsmear, Liquid Based Cytology, Visual Inspection with Acetic Acid, Colposcopic Guided Biopsy, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 2, 22-33
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(Filipiniana Analytics)
NP

0426

Diagnostic accuracy performance of the international ovarian tumour analysis (IOTA) simple rules and assessment of different neoplasias in the adnexa (ADNEX) model for identifying benign or malignant adnexal masses against histopathological diagnosis in p
Duran-Ranada, Geebee Mae M., Anzures, Cynthia U.

To know the diagnostic accuracy performance of the International Ovarian Tumour Analysis (IOTA) Simple Rules and Assessment of Different NEoplasias in the AdneXa (IOTA-ADNEX) Model for identifying benign or malignant adnexal masses against histopathological diagnosis. This was a prospective single-center, cross-sectional diagnostic accuracy study including 53 women with an adnexal mass between May 2017 and March 2018. Pelvic ultrasound examination was done and serum levels of tumor marker CA 125 were obtained in all subjects prior to surgery. Adnexal masses were categorized according to the IOTA Simple rules and IOTA ADNEX model. The gold standard was histopathological diagnosis. The sensitivity, specificity, positive and negative predictive values of each scoring system utilized was determined and compared with the histopathologic result. Using the IOTA Simple rules, 35 adnexal masses classified as benign are 94.28 % truly benign by histopathologic diagnosis and 5.72% came out to be malignant; All 12 malignant tumors were truly malignant; there were 6 inconclusive tumors and came out to be malignant. In this study, IOTA Simple rules obtained a sensitivity of 90%, specificity of 100%, positive predictive value of 100%, Negative predictive value of 94% and Accuracy of 96%. Using the baseline risks assessment proposed by IOTA ADNEX Model, overall computation are as follows: (1) Sensitivity of 96.88 %, (2) Specificity of 90.48, (3) Positive Predictive Value of 93.94%, and a (4) Negative Predictive Value of 95% The majority of adnexal masses in our study were classified correctly using the IOTA Simple rules and IOTA ADNEX model. Due to high statistical significant values obtained by IOTA Simple rules, its use is validated and is encouraged to be the standard of use in scoring adnexal masses. In this study, we are able to prove that by subjective expert opinion from an expert sonographer in reclassifying those that are unclassified by IOTA simple rules approximates 100% accuracy.

Keywords: *IOTA simple rules, IOTA ADNEX model, Adnexal masses, Ovarian neoplasm, Ovarian cancer, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 3, 9-21
2019 May to June,
(Filipiniana Analytics)
NP

Diagnostic performance of international ovarian tumor analysis (IOTA) simple descriptors, simple rules and sassone scoring system among patients with ovarian disease in a tertiary specialty hospital

de Guia-Liwanag, Ma. Teresita S., Gil-Armeza, Angeline A.

Accessibility, cost-effectiveness and consistency in identifying pelvic masses made ultrasonography one of the first imaging modality used by clinicians in evaluating women with ovarian disease. Scoring systems to differentiate a benign or malignant lesion has been formulated for many years and the International Ovarian Tumor Analysis (IOTA) group has developed several evidenced-based algorithms for classifying adnexal diseases. This research performs prospective validation using IOTA Simple Descriptors and IOTA Simple Rules, compared with Sassone scoring system to differentiate benign and malignant disease. To determine and compare diagnostic performance of IOTA Simple descriptors, IOTA Simple rules and Sassone Scoring System in classifying benign and malignant masses. A cross-sectional study was done on patients assessed to have adnexal mass or tumors either by symptoms or by physical examination and confirmed by ultrasound using two-dimensional gray-scale with Doppler studies. The classification by sonographic features was based on the IOTA Simple Descriptors, IOTA Simple Rules and Sassone Scoring System and correlated with the histopathologic result as the gold standard. A total of eighty-two cases were analyzed in the study, seventy three of which was benign. Of those with malignancy, sixty one percent belonged to ages 31-50 years old. The most common benign histopathologic diagnoses were dermoid, endometrial cyst and serous cyst, while Adenocarcinoma is the most frequent type of ovarian carcinoma. The results showed high sensitivity for IOTA simple descriptors for benign tumors at 95%. On the other hand, specificity was 85% for both IOTA Simple Rule and Sassone scoring index with low sensitivity at 58% and 44% respectively. Accuracy of the different sonologic indexes ranges from 72 to 83%. Comparing IOTA Simple Rules and Sassone Score, specificity was comparable at 85%, however with lower sensitivity for Sassone Score System.

Keywords: *Accuracy, Ovary, Sensitivity, Specificity, Ultrasonography, Medicine*

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2018 July to August,
(Filipiniana Analytics)
NP

Diagnostic performance of mean platelet volume in the diagnosis of acute myocardial infarction: a meta-analysis

Acapulco, Kathrina Aseanne

The aim of this systematic review and meta-analysis is to determine summary estimates of the diagnostic accuracy of mean platelet volume for the diagnosis of myocardial infarction among adult patients with angina and/or its equivalents in terms of sensitivity, specificity, diagnostic odds ratio, and likelihood ratios. The primary search was done through search in electronic databases. Cross-sectional, cohort, and case-control articles studying the diagnostic performance of mean platelet volume in the diagnosis of acute myocardial infarction in adult patients were included in the study. Eligible studies were appraised using well-defined criteria. The overall mean MPV value of those with MI (9.702 fl; 95% CI 9.07 – 10.33) was higher than in those of the non-MI control group (8.85 fl; 95% CI 8.23 – 9.46). Interpretation of the calculated t-value of 2.0827 showed that there was a significant difference in the mean MPV values of those with MI and those of the non-MI controls. The summary sensitivity (Se) and specificity (Sp) for MPV were 0.66 (95% CI; 0.59 - 0.73) and 0.60 (95% CI; 0.43 – 0.75), respectively. The pooled diagnostic odds ratio (DOR) was 2.92 (95% CI; 1.90 – 4.50). The positive likelihood ratio of MPV in the diagnosis of myocardial infarction was 1.65 (95% CI; 1.20 – 22.27), and the negative likelihood ratio was 0.56 (95% CI; 0.50 – 0.64). The intended role for MPV in the diagnostic pathway of myocardial infarction would perhaps be best as a triage tool. MPV values can discriminate between those who have MI and those without. For a patient with angina presenting with elevated MPV values, it is 1.65 times more likely that he has MI. It is implied

that the decision to treat a patient with angina or its equivalents as a case of MI could be supported by an elevated MPV value.

Keywords: *mean platelet volume, MPV, myocardial infarction, angina, chest pain, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
(Filipiniana Analytics)

0429

A dilemma in the management of fetal pleural effusion: a case report of two cases

Gorgonio, Nephtali M. , Lim-Navarro, Lilibeth

Fetal Pleural Effusion is a rare case whose management is still a matter of debate. Its course may spontaneously resolve or lead to pulmonary hypoplasia and result in death in utero or poor neonatal outcome. This paper is a report of 2 cases and their course, from prenatal diagnosis of Pleural Effusion to delivery. This report includes sonographic scans, description of the laboratory work – up and other imaging tests that were done. The 1st case report was successfully managed with Thoraco-amniotic shunting, while the 2nd case was seen late and had an adverse neonatal outcome. This case report was done to increase awareness among obstetricians and sonologists in offering counsel to patients and their families, especially in our low resource set-up, where in in utero interventions are not available.

Keywords: *Fetal Pleural Effusion, Pulmonary hypoplasia, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 1, 30-36
2018 January to February,
(Filipiniana Analytics)
NP

0430

Double coronary artery fistula from left circumflex artery draining to the left atrium in a rheumatic heart disease patient: a case report

Macabanding, Jamailah Bautil, Batalla, Elfred M.

Coronary artery fistula (CAF) is a connection between one or more of the coronary arteries and a cardiac chamber or great vessel. This is a rare defect and occurs in only 0.2% of the population. Most of the cases are congenital but acquired causes are also reported. A CAF may occur as an isolated cardiac defect or with other cardiac diseases such as rheumatic heart disease (RHD). Only a few cases of coexisting CAF and RHD have been reported. Local data reports only 0.69% CAFs associated with congenital malformations of the heart. Only 61 patients among all patients who underwent coronary arteriography in 34 years were reported to have a CAFs. We report a case of severe mitral stenosis (MS) with a double CAF from the left circumflex (LCx) artery draining into the left atrium. A 46-year old female with RHD with severe MS came in due to progressive dyspnea. The coronary angiogram revealed two fistulous tracts originating from the LCx draining into the left atrium. She underwent mitral valve replacement (MVR) surgery, left atrial plication, and closure of the fistula drainage the left atrium. The postoperative course was uneventful. A CAF is often asymptomatic until the second decade of life. Untreated, this may progress and cause ischemic and heart failure signs and symptoms. The presence of MS caused elevated left atrial pressure which might have prevented the increase in the volume of blood draining from the LCx artery to the left atrium through the fistulas. Hence, the MS might have prevented the dilatation of the two fistulas. Surgical correction is also indicated in the fistulas since resolution of the mitral stenosis with MVR will decrease the LA pressure which might result to dilatation and increased drainage of the fistulas causing complications later.

Keywords: *Coronary artery fistula, Rheumatic heart disease, Case report, Medicine*

Double trouble: a case of bilateral tubal pregnancy

Sotto, Ma. Regale Noemi O. , Chang, Christine Joy P.

Bilateral tubal pregnancy is the rarest form of ectopic pregnancy, and in most cases results from assisted reproductive techniques. The incidence of simultaneous bilateral tubal pregnancies has been reported to range from 1 per 725 to 1 per 1580 ectopic pregnancies or approximately corresponds to 1 per 200,000 pregnancies. To date, this is the only case reported in our institution. Bilateral tubal pregnancies are usually diagnosed intraoperatively, but with the advent of diagnostic tools and more readily available diagnostic modalities, an earlier diagnosis can be made to decrease maternal morbidity and mortality. This is a case of a 24-year old female, who came in at the emergency room complaining of severe hypogastric pain. She was admitted as a case of ectopic pregnancy, probably ruptured. Subsequently, emergency exploratory laparotomy was done which revealed bilateral tubal masses, which on histopathological examination confirmed bilateral tubal pregnancy.

Keywords: *Bilateral tubal pregnancy, Ectopic pregnancy, Blastocyst, Medicine*

Double trouble establishing synchronous primary tumors of the urothelium and prostate by immunohistomorphology: a report of two cases

Ong, David Jerome

Synchronous primary tumors of the urothelium and prostate are a diagnostic challenge among pathologists. Differentiating carcinomas of urothelial and prostatic origin requires careful assessment of histomorphology coupled with ancillary studies such as immunohistochemistry stains (IHC) to support the diagnosis. We report two cases of adult patients who underwent transurethral resection of the prostate (TURP), with two distinct morphologies noted on routine H&E sections. After a panel of immunohistochemical stains (HMWCK, CK5/6, CK7, CK20, GATA-3, p63, NKX3.1, and PSA), both cases were signed out as papillary urothelial carcinoma and prostatic acinar adenocarcinoma. Correlation of histomorphology with an IHC panel consisting of cytokeratins (CK5/6, CK7, CK20), a urothelial marker (GATA-3), and at least two prostatic markers (PSA, NKX3.1) is recommended in such cases.

Keywords: *immunohistochemistry, PSA, prostatic adenocarcinoma, urothelial carcinoma, Medicine*

Dynamic regulation of subcellular mitochondrial position for localized metabolite levels

Alshaabi, Haya , Heininger, Meara , Cunniff, Brian

Mitochondria are not passive bystanders aimlessly floating throughout our cell's cytoplasm. Instead, mitochondria actively move, anchor, divide, fuse, self-destruct and transfer between cells in a coordinated fashion, all to ensure proper structure and position supporting cell function. The existence of the mitochondria in our cells has long been appreciated, but their dynamic nature and interaction with other subcellular compartments has only recently been fully realized with the advancement of high-resolution live-cell microscopy and improved fractionization techniques. The how and why that dictates positioning of mitochondria to specific subcellular sites is an ever-expanding research area. Furthermore, the advent of new and improved functional probes, sensitive to changes in subcellular metabolite levels has increased our understanding of local mitochondrial populations. In this review, we will address the evidence for intentional mitochondrial positioning in supporting subcellular mitochondrial metabolite levels, including calcium, adenosine triphosphate and reactive oxygen species and the role mitochondrial metabolites play in dictating cell outcomes.

Keywords: *Metabolite gradients, Mitochondrial contacts, Mitochondrial dynamics, Reactive oxygen species, Medicine*

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2020 February,
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F(S) QP501 J82 167/2 2020

Early antibiotic therapy (EAT) decreases in-hospital mortality of patients with sepsis at the emergency department

Mendoza, Myrna T. , Tan, Irene Rosellen P.

Septic shock is the most common type of shock encountered by internists and is the most common cause of death in non-coronary intensive care units. In the 2012 Surviving Sepsis Campaign, one recommendation is antibiotic administration within three hours from sepsis recognition. Several large-scale studies challenged this recommendation with contrasting results. The researchers aim to determine the impact of early antibiotic therapy (EAT) on mortality and outcome of patients and to determine institutional compliance to current sepsis recommendations. This retrospective single center study included septic patients at the emergency room from February 2013 to January 2015 and were grouped into the EAT group (lesser than or equal to three hours) and control group (more than three hours) antibiotic initiation from sepsis recognition). Primary outcomes are in-hospital mortality, time-to-antibiotics and extraction of blood culture prior to antibiotics. Secondary outcomes include length of hospital stay, use of vasopressors and mechanical ventilation and development of sepsis-related complications. Two-hundred sixty-one patients were included with 53.26% overall mortality rate. The overall mean time-to-antibiotics is 355.1 minutes and time-to-blood culture is 434.64 minutes. Mean time-to-antibiotics were 115 and 556 minutes in the EAT and control group respectively. Mortality was significantly higher in the control group (43.7% vs. 61.3%, $p=0.006$). For the sepsis related complications, development of acute kidney injury ($p=0.033$) was higher in the EAT group and acute respiratory failure ($p=0.009$) was significantly increased in the control group. Antibiotic administration within three hours from sepsis recognition significantly reduced in-hospital mortality. Timing of antibiotics and collection of blood cultures were delayed compared to current recommendations. Among the sepsis-related complications, prolonged time-to-antibiotics (>3 hours) is associated with risk of developing acute respiratory failure and subsequent need for mechanical ventilation.

Keywords: *Early antibiotic therapy, Septic shock, Sepsis, Systemic inflammatory response syndrome, Medicine*

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Early experience of gynecologic robotic surgery in a tertiary government hospital

Domingo, Efren J., Padilla, Patrick Jose D.

Robotic surgery is a form of minimally invasive surgery wherein the surgeon controls the camera and instruments in a console, remote from the operating room table. Currently, the system in place is the da Vinci Surgical System which was approved by the United States Food and Drug Administration in 2000 for laparoscopic surgery. Since its approval in 2005 for Gynecologic procedures, the da Vinci Surgical System has been used for hysterectomies, lymph node dissections, sacrocolpopexies, myomectomies, and cerclage. This paper presents the initial seven cases of benign gynecologic diseases operated on utilizing the da Vinci Surgical System in our institution – six hysterectomies and one myomectomy. Seven gynecologic surgeries that utilized the da Vinci Surgical System in 2019 until the first quarter of the year 2020 were done. Medical records of the seven patients were reviewed. The average docking time was 38 minutes (range: 25 – 65 minutes) and the average console time was 227 minutes (range: 175 – 345 minutes). The average blood loss was 576 cc (range: 80 – 1200 cc). No cases converted to an abdominal laparotomy and no morbidities were reported. While two cases underwent blood transfusion intraoperatively, all cases were stable post-operatively and were for discharge after two days. On follow-up, all patients were stable with an unremarkable clinical course. Our initial experience demonstrates that robotic surgery appears as a viable alternative to traditional approaches. As more cases are to be done in the future, fine-tuning of the logistical set-up and surgical skills are expected, as well as venturing into other gynecologic diseases such as malignancies. Further research must be conducted on various aspects of robotic surgery, such as but not limited to outcome comparison with traditional and other laparoscopic approaches, long term outcomes, patient safety, and patient experience and preference, among others.

Keywords: *Gynecologic surgery, Minimally invasive surgery, Robot-enhanced surgery, Medicine*

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Effect of 2-week bedtime ingestion of apple cider vinegar on the blood glucose concentration (fasting blood sugar and second hour blood sugar) of gravidas with gestational diabetes mellitus in a tertiary hospital

Mercado, Maria Dolores A. , Casiple-Solas, Myra G.

Gestational Diabetes Mellitus (GDM) is a common condition that complicates a substantial number of pregnancies. Currently, the first line management for patients with GDM is dietary modification and exercise. Recent evidence suggest that there may be a complimentary hypoglycemic effect of substances such as vinegar. This study is a randomized, crossover trial, aiming to determine the effect of 2-week bedtime ingestion of apple cider vinegar (ACV) on the blood glucose concentration of gravidas diagnosed with GDM in a tertiary hospital. Specifically, it aims to describe the patients' general profile, to determine the effect of ACV on the 75 grams OGTT levels of the subjects, to correlate the change in blood glucose levels with ingestion of the same amount of ACV with the patient's BMI, and to determine the acceptability of ACV ingestion in pregnant patients. There were 32 patients included in the study. Upon diagnosis of GDM, subjects were randomized into two groups. Group A had a sequence of Medical Nutrition Therapy (MNT) for 2 weeks followed by MNT plus ingestion of 2 tablespoons of ACV diluted in a cup of water for another 2 weeks. Group B had the reverse sequence. A 75g OGTT was taken on Day 0, Day 14, and Day 28 of treatment, in which the values were compared. The data were analyzed using SPSS 16.0. Results showed that there is a marginally significant increase in the fasting blood sugar (FBS) and 2nd hour blood sugar at the moment when ACV was withdrawn. A greater reduction in the blood sugar level was noted in patients with higher BMI during the period when patients were given the ACV. The Likert scale response was also done showing that ACV is acceptable, affordable and well-tolerated among pregnant patients.

Keywords: *Gestational Diabetes Mellitus, Apple cider vinegar, Pregnancy, Hypoglycemic effect, Medicine*

The effect of health education on blood pressure in an urban poor community

Medina, Ana Marie O., Ortega, Purificacion V., Tuzara, Deodora, Parazo, Mercedita A., Alino, Celia, Munoz, Linda, Durante, Marcelito L., Vilela, Gerald C., Javelosa, Ranulfo B. Jr., Agunod-Cheng, Patricia

The objective of the study was to evaluate the effect of cardiovascular health education on change in blood pressure at 3, 6, 12, and 18 months follow-up. This was a prospective cohort study. Participants were from an urban poor community in Metro Manila. Included were the 98 adults at least 40 years of age with hypertension, without cardiovascular disease. Among those previously diagnosed with hypertension, 20.3% had controlled blood pressures at the time of screening. There were 29.6% newly diagnosed cases of hypertension in the study. During the 18-month intervention phase, cardiovascular disease health education and counseling on risk factor control were given along with medical check-ups. Systolic and diastolic blood pressures were measured at 3, 6, 12, and 18 months. The decreases in mean systolic blood pressures from the baseline at 3, 6, 12 and 18 months were 11.9, 15.2, 9.1, and 14.1-mm Hg, respectively. The diastolic blood pressures decreased by 6.9, 9.3, 4.6, and 4.4 mm Hg. These differences were statistically significant. For the urban poor, health education on risk factor modification and cardiovascular diseases can be an important tool in improving blood pressure.

Keywords: *Blood pressure, Urban poor, Health education, Lifestyle changes, Medicine*

Effect of second-hand cigarette smoke exposure on neonatal birth weight and prematurity among pregnant patients in secondary hospitals in Manila: a prospective cohort study

Llamas-Clark, Erlidia F., Patupat, Annarose L.

Smoking is a known risk factor for many maternal and perinatal morbidities. Regrettably, as many as 69.8% of mothers, though not active smokers themselves, are exposed to second-hand cigarette smoke (SHS). No level of SHS exposure is safe. Due to the potential harmful effects to the mother and her unborn child, it is important to establish the effect of SHS exposure on neonatal outcome among our pregnant patients. To determine the effect of second hand cigarette smoke exposure on neonatal outcomes. Participants are patients with low risk singleton pregnancies who were going for prenatal check up and eventually delivered in secondary hospitals in Manila. Descriptive statistics was used to summarize the demographic and clinical characteristics of the patients. Null hypotheses were rejected at 0.05 α -level of significance. The computer software STATA 13.1 was used for data analysis. The husband was the most identified source of second-hand smoke. Maternal weight was also higher among the exposed group. The most significant effect of SHS exposure among newborns was a 103 grams difference in mean birth weight. There was no difference in pediatric aging, birth length, and anthropometric measurements. The prevalence of smoking in Philippines remains high at 23.8% among adult population, majority being male adults. Exposure to second-hand smoke during pregnancy was noted to be as high as 69.8%. The most common source of second-hand smoke is the husband, and thus, he should be one of the targets of preventive strategies in second-hand smoke exposure.

Keywords: *Second hand smoke, Passive smoke, Pregnancy, Prematurity, Low birthweight, Medicine*

The effectiveness of evening primrose oil gel capsule as a cervical ripening agent during labor induction as measured by bishop score on term singleton pregnant patients

Aguilar, Angela S. , Diansuy, Nina Nonette

Pre-induction of labor cervical ripening increases success of labor induction when there is unfavorable cervix. Evening primrose oil soft gel capsule contains linoleic and gamma-linolenic acid, which are precursors of prostaglandins E1 and E2. To measure the effectiveness of evening primrose oil capsule as a cervical ripening agent by measuring the Bishop score before and 4 hours after intravaginal insertion of six capsules. A quasi-experimental cross-sectional study was conducted from the period of May to July 2016 involving labor induction patients with a Bishop score ≤ 4 , an intact amniotic sac and a Biophysical profile score of 10/10 or 8/8. Thirteen patients had an average age of 27 ± 6 years, and a mean age of gestation of 40 ± 1 weeks. Seven patients (54%) were nulliparous, 2 (15%) were primiparous and 4 (31%) were multiparous. Seven patients (54%) had hypertension, 1 (8%) had diabetes mellitus, 5 (38%) had post-term pregnancies. A paired t-test was done to check for statistically significant changes in the Bishop score. Change in the Bishop score from baseline to 4 hours after insertion of evening primrose oil capsules was statistically significant ($p=0.001$). Eleven patients (85%) had improvement in the Bishop score after 4 hours, 4 (31%) of which had a clinically significant change in the Bishop score (≥ 4). Specifically, there were statistically significant changes in the dilatation ($p=0.027$), effacement ($p=0.006$) and consistency ($p=0.002$). The mean birth weight of deliveries was 3192 ± 351 grams. Nine patients (69%) underwent primary low segment cesarean section, six (46%) of which for nonreassuring fetal status, 2 (15%) for arrest in cervical dilatation, and 1 (8%) for intraamniotic infection. Four patients (31%) successfully delivered vaginally. Results showed a positive effect on the Bishop score during cervical ripening although further studies are needed to establish direct correlation.

Keywords: *Bishop score, Cervical ripening, Evening primrose oil capsule, Labor induction, Medicine*

The Effectiveness of Pentoxifylline in NAFLD: A Meta-Analysis

Ong, Janus P. , Cuaño, Carlos Rolando , Torres, John Mark K.

Rising prevalence of non-alcoholic fatty liver disease (NAFLD) suggests its correlation with liver failure worldwide. To date, there is no proven pharmacologic therapy for NAFLD. Pentoxifylline (PTX) with its anti-tumor necrosis factor properties has shown improvement of histological parameters, reductions in transaminase levels and serum cytokines among patients with NAFLD. The main objective is to determine the effectiveness of PTX in the reduction of progression of NAFLD in terms of reducing levels of aspartate transaminase (AST) and alanine transaminase (ALT), improving liver histology parameters and in decreasing TNF- α , IL-6 and IL-8. A comprehensive literature search showed seven randomized controlled trials ($N=222$) comparing PTX (1,200mg/day) with placebo. Two reviewers independently selected studies, assessed quality, and extracted and pooled outcomes including AST levels, ALT levels, serum cytokines and liver histology. All selected studies were found to be of low risk of bias based on Cochrane risk of bias assessment tool for randomized trials. Statistical analysis and forest plot generation were done using the Review Manager Software 5.3. Pooled results showed that PTX significantly reduced the ALT (WMD= -20.08; 95% CI: -40.20, 0.05; $p=0.05$) and AST (WMD= -11.38; 95% CI: -20.47, -2.29; $p=0.01$) in NAFLD patients. PTX significantly improved lobular inflammation (WMD= -

0.45; 95% CI: -0.89, -0.01; $p=0.04$), fibrosis (WMD= -0.39; 95% CI: 0.83, 0.05; $p=0.08$) and NAS score (WMD= -0.52; 95% CI: -1.06, 0.0; $p=0.051$). Among serum cytokines, greater reduction was demonstrated in TNF- α (WMD= -20.20; 95% CI: -50.46, 10.41; $p=0.20$). Pentoxifylline (PTX) decreases the amino-transferase activities, improves the liver histology and TNF- α of NAFLD patients. Demonstrating effects on serum TNF- α which plays a key role in progression to hepatic steatosis, it may be used as an adjunct to diet and lifestyle modifications in the treatment of NAFLD.

Keywords: *Meta-analysis, Nonalcoholic fatty liver disease, Nonalcoholic steatohepatitis, Pentoxifylline, Medicine*

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0441

The effectiveness of utilizing the Zhang's criteria compared to Friedman's criteria in increasing the rate of successful vaginal delivery among primigravid parturient in a tertiary hospital

Bunda, Khristine Rosemarie R., Mercado, Alberto R.

To determine the effectiveness of utilizing the Zhang's criteria as compared to Friedman's criteria in increasing the rate of successful vaginal delivery among primigravid parturient in a tertiary government hospital. This is a prospective cohort study conducted in a tertiary hospital. The population consisting of primigravid parturient of any age admitted at term pregnancy with a gestational age between 37 and 42 weeks. Included were singleton pregnancy, with no co-morbidities, vertex position on admission, with intact amniotic membranes, and in active phase of labor (either 4cm or 6cm cervical dilatation), who consulted at the emergency room of the institution. Multigravid patients, those with multiple pregnancy and ruptured membranes were excluded from the study. Two groups of cohorts were recruited based on the internal examination of the principal investigator upon admission. Cohort A is composed of pregnant women admitted at 6cm cervical dilatation fulfilling the Zhang's criteria whereas Cohort B is composed of pregnant women admitted at 4cm cervical dilatation fulfilling the Friedman's criteria. Socio-demographic characteristics were recorded. Their course of labor was monitored; contractions were augmented accordingly if needed. The mode of delivery was noted such as spontaneous vaginal delivery or cesarean section. The neonatal outcome was recorded as to apgar scores obtained for both groups. A greater proportion of parturients were young, single and with normal body mass index. A higher proportion of those under Friedman's group was augmented with oxytocin (100% vs. 53.4%). A greater proportion of those in Zhang's group had successful vaginal delivery (98.2% vs. 81.8%) ($p=0.011$, OR=18.167, 95% CI: 1.943, 169.867). Parturients under Zhang's group had achieved less hours of active labor. The rate of successful vaginal delivery is significantly different between the two groups. A greater proportion of pregnant women under Zhang's group achieved successful vaginal delivery as compared to Friedman's group.

Keywords: *Friedman curve, Labor, Parturient, Primigravid, Medicine*

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0442

Efferocytosis during myocardial infarction

Yoshimura, Chikashi , Nagasaka, Akiomi , Kurose,Hitoshi , Nakaya, Michio

Myocardial infarction is one of the major causes of death worldwide. Many heart cells die during myocardial infarction through various processes such as necrosis, apoptosis, necroptosis, autophagy-related cell death,

pyroptosis and ferroptosis. These dead cells in infarcted hearts expose the so-called ‘eat-me’ signals, such as phosphatidylserine, on their surfaces, enhancing their removal by professional and non-professional phagocytes. Clearance of dead cells by phagocytes in the diseased hearts plays a crucial role in the pathology of myocardial infarction by inhibiting the inflammatory responses caused by the leakage of contents from dead cells. This review focuses on the rapidly growing understanding of the molecular mechanisms of dead cell phagocytosis, termed efferocytosis, during myocardial infarction, which contributes to the pathophysiology of myocardial infarction.

Keywords: *Apoptosis, Efferocytosis, Myocardial infarction, Necrosis, Phosphatidylserine, Medicine*

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0443

Efficacy of betaine + polyhexanide as anti-septic wound irrigating solution prior to subcutaneous layer and skin closure of cesarean section in preventing surgical site infection

Mercado, Wilhelmina A., Mallari, Romina Grizelda O.

Surgical site infection (SSI) after cesarean section occurs in 3-15% of cases. Surgical irrigation has been widely used as a measure of reducing SSI, however, there are no official guidelines for its practice. To determine the efficacy of Betaine + Polyhexanide (Prontosan) as anti-septic wound irrigating solution prior to subcutaneous layer and skin closure of cesarean section in preventing surgical site infection. One hundred thirty-two women who underwent cesarean section were included from April to October 2017. The cesarean section was done according to the standard operating procedure of the hospital. All subjects were given prophylactic antibiotics prior to the cesarean section. Subjects were then randomly assigned, 66 in Prontosan and 66 in Saline as irrigating solution prior to closure of subcutaneous layer and skin. Post-operatively, subjects were monitored and evaluated for signs and symptoms of superficial surgical site infection on Day 3, 7-10 and 30. There was no demographic difference identified between the two groups (age, pre-pregnancy BMI, obstetric parameters and comorbidities) except that saline group had a higher proportion of emergency cesarean section (84% vs 70%). The incidence of surgical site infection 2 was similar in the two groups (15.15% vs 9.09 % on Day 3, 7.84 % vs 6.78% on Day 7-10, 3.23% vs 0 on Day 30). Betaine + Polyhexanide (Prontosan) and Saline wound irrigation showed no reduction in the incidence of superficial surgical site infection in women undergoing cesarean section.

Keywords: *Cesarean section, Infection, Wound irrigation, Medicine*

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0444

The efficacy of evening primrose oil as a cervical ripening agent for gynecologic procedures: a single-blinded, randomized controlled trial

Veloso-Borromeo, Mary Girlie , Verano, Rusienne Mae A.

Evening Primrose Oil (EPO) is one of the most commonly prescribed cervical ripening agents. Cervical ripening is the softening, effacement, and dilation of the cervix that occur prior to active labor, and is an intervention that is used for certain indications, such as postdates pregnancy. There are gynecologic cases wherein the cervix is closed and dilatation has not occurred making the procedure difficult. In studies, EPO works by softening and ripening the cervix in the pregnant woman. More likely it has the same effects in a non-pregnant patient with regards to softening and dilating the cervix during gynecologic procedures. The study was conducted in a tertiary

hospital. Patients scheduled for gynecologic procedures were randomly grouped under the control and study group. Both groups had an internal examination during admission. The study group, in addition, were given EPO 4 capsules intra-vaginally, 6 hours prior to the contemplated procedure. Cervical characteristics were assessed initially on admission and pre-procedure. Consistency were assessed using the Consistency Index (CI) and graded as firm=1, medium=2 and soft=3. Dilatation were assessed using the Dilatation Index (DI) and graded as closed=1, admits tip =2, >1cm=3. Pre-procedure, cervical characteristics and the CDI of both groups were assessed. Hegars dilators were used to assess the degree of dilatation, noting the diameter of dilator that can be introduced freely, and to what diameter the cervix can be maximally dilated. 80 patients were enrolled in the study; 39 patients were assigned in the control group and 38 patients were assigned in the study group (3 were excluded). In the study group, their DI improved by 36.2% (pre = 1.53+/-0.51 to post = 2.08+/-0.49) ($p<0.001$), CI increased by 115.9% (pre=1.16+/-0.37 to post = 2.50+/-0.65) ($p<0.001$), and their CDI changed by 70.6% (pre=2.68+/-0.74 to post = 4.58+/-0.95) ($p<0.001$). The changes of scores in all the cervical parameters in the study group were statistically significant. EPO 4 capsules punctured and administered intra-vaginally 6 hours prior to contemplated gynecologic procedure can promote cervical ripening as exhibited by the improvement of the CDI from initial assessment to pre-procedure assessment.

Keywords: *Evening Primrose Oil, EPO, Cervical Ripening Agents, Medicine*

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0445

Efficacy of febuxostat for the prevention of tumor lysis syndrome in patients with hematological and soft tissue malignancies: a meta-analysis

Mendoza, Kimberly C. , Andaya, Angelo Rome Y. , Pacio, Allyn E.

Tumor lysis syndrome (TLS) is a therapy-related complication resulting from the rapid lysis of malignant cells post-treatment. The control of serum uric acid level plays a key role in its prevention, thus, allopurinol is used. Febuxostat is a novel xanthine oxidase inhibitor and there are currently no recommendations for using such in the prevention of TLS, hence, this study was conducted. This study aims to determine the efficacy of febuxostat in the prevention of TLS. Extensive search for randomized controlled trials (RCT) focusing on the use of febuxostat in the prevention of TLS was done. Each article was appraised independently by the researchers. The data were analysed using Rev Man 5.3. Two trials were included in this review. The study results revealed that febuxostat, when compared to allopurinol, was able to decrease serum uric acid as hyperuricemia is the hallmark of TLS. This decrease in serum uric acid was consistent in both studies. Serum uric acid levels at the end of the treatment showed a standard mean difference of -1.09 (95% CI-1.29, -0.88, p for heterogeneity <0.01 , p for effect <0.01 , $I^2 = 97\%$). The trend of both studies favored the efficacy of febuxostat. The adverse effects documented during the study period in both trials were mostly noted from the chemotherapeutic agents and none from the use of febuxostat. Febuxostat was shown to be more effective than allopurinol in the prevention of TLS.

Keywords: *Febuxostat, Prevention, Tumor lysis syndrome, Meta-analysis, Medicine*

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Efficacy of single dose antenatal corticosteroid on reducing the morbidity and mortality of preterm infants: a retrospective cohort study

Soriano-Estrella, Agnes L. , Yu, Mary Liezl N.

To determine the efficacy of a single dose of antenatal dexamethasone on the neonatal morbidity and mortality of preterm infants born between 24 weeks to 33 weeks and six days age of gestation at a tertiary government hospital. A detailed chart review of both maternal and neonatal records of all neonates born between 24 weeks and 33 weeks and 6 days age of gestation at a tertiary government hospital from January 1, 2011 to December 31, 2013 was done. Patients were grouped based on maternal exposure to antenatal dexamethasone. After which, rate of neonatal deaths and morbidities were recorded. Chi-square test for categorical variables, independent t-test for continuous data and logistic regression were used for analysis. Seven hundred and three maternal-neonatal dyads were included. Of these, 120 (17.1%) were not exposed to any antenatal corticosteroid prior to delivery, 347 (49.4%) were exposed to a single dose of 6mg dexamethasone, and 236 (33.5%) received a complete course of four doses of 6-mg dexamethasone before preterm delivery. There were better neonatal outcomes from mothers who received completed doses of antenatal corticosteroids than those who received only a single dose, however in comparison to those who have not received any antenatal corticosteroids, the group that received only a single dose had significantly better neonatal outcome. Logistic regression analysis demonstrated that exposure to a single dose of dexamethasone before delivery was associated with reduction in neonatal mortality, and select neonatal morbidities. It was observed that there was improved neonatal outcomes in neonates given a single dose dexamethasone compared to those who didn't receive any antenatal corticosteroid. Obstetrician gynecologists should not hesitate in administering antenatal dexamethasone even if completion may not be feasible.

Keywords: *Antenatal corticosteroid, Dexamethasone, Incomplete doses, Preterm neonates, Single dose, Medicine*

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Embolization in abdominal pregnancy: a case report

Crisologo, Ma. Cristina P. , Argel, Jay Ian R.

Abdominal pregnancy is a rare form of ectopic pregnancy. This type of pregnancy poses a difficult situation since it can incur high morbidity to mother and the fetus. Diagnosis is often difficult and surgical management should be multidisciplinary in approach. This paper presents a case 29-year-old who presents as missed abortion, subsequently diagnosed with abdominal pregnancy. Embolization of major vessels prior to evacuation of products of conception in abdominal pregnancy is a management option to prevent catastrophic complications such as hemorrhage.

Keywords: *Abdominal pregnancy, Abortion, Ectopic, Embolization, Laparotomy, Hemorrhage, Medicine*

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Establishing a threshold for endometrial sampling in post menopausal women with an incidentally found thickened endometrium: a retrospective cohort study

Prodigalidad-Jabson, Lisa T. , Factor, Patricia

Pelvic ultrasonography is currently not recommended as a screening tool for endometrial cancer, particularly in asymptomatic women; however, its use for other indications such as pelvic masses has led to incidental findings of thickened endometrium in post menopausal women. The aim of the study is to evaluate the clinical utility of endometrial ultrasound in asymptomatic Filipino postmenopausal women and to provide a threshold for invasive endometrial sampling. A cohort of postmenopausal women (aged ≥ 50 years) who underwent pelvic ultrasonography at a tertiary hospital for indications other than vaginal bleeding was retrospectively evaluated. Women were included if they had an endometrial lining of at least 5 mm and had an endometrial biopsy. Receiver operating characteristic (ROC) analysis was used to determine the endometrial thickness threshold for which endometrial thickness is able to correctly differentiate benign endometrial pathology from endometrial hyperplasia and carcinoma. Out of 90 women included in the study, carcinoma was identified in 3 (3.33%) and hyperplasia was noted in 4 (4.44%). The most common histopathology noted was: endometrial polyp (35.56%), atrophic endometrium (30%) and benign endometrial tissues (18.98%). The calculated area under ROC curve was 54.39% (95% CI 34.38-79.41%), which indicates the inability of endometrial thickness to differentiate benign endometrium from endometrial carcinoma or hyperplasia in asymptomatic women with an incidentally found thickened endometrium. Based on the results of the study, endometrial thickness alone cannot be used as basis for deciding whether to perform endometrial sampling, there is no endometrial thickness threshold for which the endometrial hyperplasia and carcinoma can be correctly identified. The decision to perform an endometrial biopsy should be done on a case to case basis. In the absence of a high index of suspicion for endometrial hyperplasia and carcinoma even in the presence of thickened endometrium, endometrial sampling is unnecessary.

Keywords: *Endometrial cancer, Endometrial hyperplasia, Endometrial sampling, Pelvic ultrasound, Postmenopausal, Incidental finding, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 1, 1-8
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Evaluation of a training workshop on the use of visual inspection with acetic acid in cervical cancer screening

De Ramos, Joanne Sebastiana M. , Germar, Maria Julieta V.

The Department of Health developed a program for Cervical Cancer Prevention and Control in the Philippines and this involves training of health care providers on Visual Inspection with Acetic Acid (VIA). The evaluation of this training program aims to determine the effectivity of the training workshop in increasing the knowledge and skills of healthcare providers in VIA and whether this would translate to practice in their workplaces. The first run of the training program was evaluated and the approach used was Kirkpatrick's model. Participants were asked to complete an evaluation questionnaire for Level 1 evaluation. A pre-test, post-test and performance checklist were accomplished for Level 2 evaluation. For Level 3 evaluation, randomly selected participants were interviewed via mobile phone. Data analysis involved descriptive methods and inferential statistics (T-test and McNemar test) for Level 2. Level 1 evaluation demonstrated a high over-all satisfaction rating from the participants ($\bar{x} \pm s = 4.59$) and the training workshop was found to be relevant and useful to their practice. Level 2 evaluation showed a significant increase in the knowledge of the participants ($P=.001$) particularly in the core topics of cervical cancer epidemiology ($P=.001$) and VIA ($P=.006$). There was likewise a significant improvement in the performance of VIA from the first to the last patient encounter ($P=.000$). Level 3 evaluation showed that the participants interviewed have realized the importance of VIA. The training workshop was effective in increasing the knowledge base and clinical skills required of health care professionals who will provide cervical cancer screening services using visual inspection with acetic acid. As a direct effect of the increase in knowledge and skills, the participants have started to incorporate their new learnings into their practice.

Keywords: *Visual Inspection with Acetic Acid, Kirkpatrick's model, Cervical Cancer screening, Cervical Cancer Prevention, Medicine*

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0450

An evaluation of pooling strategies for RT-qPCR testing for SARS-CoV-2 infection *Lo, Raymundo*

Sample pooling of COVID-19 PCR tests has been recently proposed as a low-cost alternative to individual tests. This multi-site, laboratory-based, proof-of-concept study explores the feasibility of pooled SARS-CoV-2 RT-qPCR testing, by demonstrating the effect of pooling on sensitivity, specificity, accuracy, number of tests saved, and turnaround time. The research was conducted in two experiments. In Experiment 1, archival nasopharyngeal (NPS) and oropharyngeal (OPS) swab samples were diluted to simulate 5, 10, and 20 sized pools, and tested for SARS-CoV-2 RNA using RT-qPCR. In Experiment 2, actual nasopharyngeal and oropharyngeal swab samples were collected from asymptomatic low-risk volunteers. Aliquots of the samples were pooled following the 5, 10-5, and 20-10-5 multi-staged Dorfman pooling methods and tested. The sensitivity, specificity, accuracy, test savings, and turnaround time for each pooling method were documented. The study provided evidence that pooling of NP and OP samples for SARS-CoV-2 RNA detection using RT-qPCR is feasible and can be implemented in the Philippines. A 2-stage Dorfman 5 pooling strategy appears to be the best method, because it has the highest over-all accuracy, while still achieving acceptable test savings, and turnaround time. Pooling of nasopharyngeal and oropharyngeal swab samples prior to RT-qPCR testing may be considered by select molecular diagnostic laboratories to further increase testing capacity and at the same time reduce the cost of testing.

Keywords: *pooled testing, specimen pooling, RT-qPCR, COVID-19, SARS-CoV-2, Medicine*

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0451

Evans syndrome complicated by chronic hypertension with superimposed pre-eclampsia with HELLP syndrome in pregnancy: a case report *Mendoza, Maria Czarina , Ching, Maria Cecilia C.*

The case of a pregnant woman initially presenting with low platelets and low haemoglobin and subsequently diagnosed as a case of Evans Syndrome is presented. Owing to its extremely low incidence, little research exists investigating pregnancies complicated by Evans Syndrome. Although diagnosis is simple and straightforward, management of a pregnancy of this nature has proven to be complex and challenging. Further complicating the case and its management is the concurrent diagnosis of Chronic Hypertension with Superimposed Pre-eclampsia, in complete HELLP Syndrome. Pre-eclampsia in the background of Evans Syndrome makes this case a truly interesting case. The individual effects of the two disease entities in a single patient are discussed in this report.

Keywords: *Autoimmune hemolytic anemia, Evans syndrome, HELLP syndrome, Idiopathic thrombocytopenic purpura, Pre-eclampsia, Medicine*

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2017 January to February,
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NP

Evolution of a cesarean scar pregnancy into a placenta accreta at term: A case report

Dalawangbayan, Maria Anna Luisa F. , Elep, Rachel V.

This is a case report of a first trimester cesarean scar pregnancy (CSP) evolving into a placenta accreta at term based on the ultrasound imaging. The gestational sac, initially implanted at the site of previous scar, grew into the uterine cavity as the pregnancy progressed and resulted into a viable birth complicated by placenta accreta. Cesarean scar pregnancy is a rare form of ectopic pregnancy and is associated with increased maternal morbidity and mortality. Thus, early recognition of the salient sonographic findings is crucial because a delay could lead to a life-threatening condition. Early diagnosis also gives women the option to choose between expectant management and termination of pregnancy. The exact incidence of CSP has not been determined but its incidence is on the rise in parallel with the high rate of cesarean sections. There are two types of CSP. The first type is due to the implantation of the gestational sac on the scar with progression towards the uterine cavity. In this type expectant management is justifiable since pregnancy may progress into a viable pregnancy. The second type involves growth of gestational tissues towards the bladder and abdominal cavity and is associated with uterine rupture if immediate intervention is not undertaken. In this report, we present a case of a first trimester CSP that was managed expectantly and developed into placenta accreta at term.

Keywords: *Cesarean scar pregnancy, Ectopic pregnancy, Placenta previa, Accrete, Medicine*

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Exercise stress test through brisk walking: a complementary way to assess fetal well-being in term pregnancy

Mercado, Maria Dolores A. , Co- Sy, Eileen , Aquino, Princess May P.

To determine the effect of exercise stress test (EST) through brisk walking on the cardiotocogram tracings (CTGs) and the association of the tracings to neonatal outcomes. This one-group pretest-post test experimental study involved 65 term pregnant women (mean age = 25.94 + 4.66 years) who underwent brisk walking exercise using a motorized treadmill for 30 minutes, following American College of Obstetricians and Gynecologists (ACOG) guidelines for exercise among pregnant women. Pre- and post- walk CTGs were assessed, with presence of post-walk decelerations taken to mean a positive EST. Sensitivity (positive EST in sick / meconium-stained / cord coil babies), specificity (negative EST in well babies), positive predictive value (PPV) (probability of sick / meconium-stained / cord coil babies given positive EST) and negative predictive value (NPV) (probability of well babies given negative EST) were computed. A significant difference in the proportion of subjects with pre- and post-walk decelerations was noted (p-value = 0.000) wherein 18 subjects (28.13%) without decelerations in the baseline CTG had decelerations in the post-walk CTG. These decelerations were significantly associated to having sick, meconium-stained, or cord coil babies (p-values < 0.05). EST had 80% sensitivity, 75% specificity, 21.1% PPV and 97.8% NPV for detecting sick babies; 75% sensitivity, 77.2% specificity, 31.6% PPV and 95.7% NPV for detecting meconium-stained babies; and 75% sensitivity, 85.7% specificity, 63.2% PPV and 91.3% NPV for detecting nuchal cord. Exercise stress testing is a complementary way of assessing fetal well-being due to manifestation of decelerations in the post-walk CTG which could have gone undetected if only the resting CTG was done. The EST had high sensitivity for detecting sick / meconium-stained / cord coil babies and has the advantage of reinforcing a reassuring fetal condition due to its high NPV for detecting well babies.

Keywords: *Cardiotocogram, Exercise test, Fetal heart rate, Medicine*

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Expulsion rate of immediate versus early postpartum intrauterine device insertion after vaginal delivery: A cross sectional study

Chiu, Jennifer Mary Joy V., Torres, Mildred

Background: Progressively increasing population of the country leads to unmet needs for responsible parenthood. This is reflective to reproductive age women with unplanned pregnancies which may consequently lead to maternal morbidity and mortality and adverse perinatal outcomes. Provision of family planning methods is implemented. One of the temporary methods of Long Acting Reversible Contraception (LARC) is Intrauterine Contraceptive Device (IUD). The effectiveness is similar to tubal sterilization with its perfect use. However, one of the drawbacks is dealing with its expulsion which affects its efficacy. The study determined the expulsion rate between Immediate and Early postpartum IUD insertion after vaginal delivery. Expulsion rate was evaluated during the following periods: prior to discharge, after 4 weeks, after 12 weeks and 24 weeks post-insertion. This was an Observational Cross Sectional Study conducted for a year designed to collect data among patients who had IUD insertion after vaginal deliveries in a 6-month period of follow up. Sample size was computed using epi info 7.0. Finite Population Collection was derived to meet the population size available which resulted to 159 participants. Randomization was initiated to classify between immediate and early IUD insertion. Expulsion was observed during follow up at the family planning center of the institution. This data showed no direct correlation in the expulsion rates between early and immediate postpartum IUD insertion. The expulsion rate was 6.25% for Immediate and 5.55% for Early IUD insertion respectively. There were no expulsion observed beyond 12 weeks post insertion. Relationship between early/immediate IUD insertion and expulsion rate was investigated using Chi square test. Improved education and heightened awareness among reproductive aged women would initiate higher acceptance of IUD during postpartum period. Proper and improved technique of IUD insertion during postpartum period may decrease expulsion rate hence promoting better utilization of this family planning method.

Keywords: *Early postpartum IUD, Immediate postpartum IUD, Intrauterine Contraceptive Device (IUD), Medicine*

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External quality assessment scheme for transfusion transmissible infections among blood service facilities in the Philippines, 2018

Punzalan, Kenneth Aristotle

External Quality Assessment Scheme (EQAS) is an important and vital component of a quality system to which a retrospective and periodic assessment of quality can be undertaken by an independent external agency. The Transfusion Transmissible Infections–National Reference Laboratory (TTI-NRL) annually provides an EQAS program for transfusion transmissible infections to all blood service facilities in the Philippines as a requirement for the renewal of their license to operate and raise the quality standards of testing for infectious diseases. A total of 188 participants registered in the 2018 test event and were given an EQAS panel comprised of a serology program (HVHT4120) and malaria program (MLRA415). Results from the participants were submitted through an online informatics system managed by OneWorld Accuracy Canada using the ISO 13528:2008 Robust Statistics method (Huber's Method). Results were analyzed and evaluated with the reference result from the TTI-NRL. The HVHT4120 program generated 15,330 results and the MLRA415 generated 940 results. 97 results (0.63%) and 80 results (8.51%) were reported as aberrant from each program respectively and were either due to random or systematic errors. The data generated from this test event are used for the improvement of the quality processes of each participant and the subsequent renewal of their license to operate as required by local health regulations.

Keywords: *EQAS, transfusion transmissible infections, blood safety, quality improvement, Medicine*

Extra virgin olive oil and postprandial blood glucose in type 2 diabetes mellitus patients: a randomized controlled cross-over trial

Macabuag-Oliva, Andrea , Gonzales, Ma Cecilia , Isidro, Maria Jocelyn , Galang, Daphne

Dietary intervention remains an important factor in the management of diabetes mellitus, and many patients have employed herbs and oils to help manage their chronic diseases. Extra virgin olive oil (EVOO) is widely known for its cardio-vascular benefits. However, its effect on the blood glucose of type 2 diabetes mellitus patients has not been extensively studied. In this study, we aimed to determine if the addition of EVOO to meals results in a lower postprandial blood glucose among type 2 diabetes mellitus patients. Thirteen patients were included in this randomized controlled cross-over trial. They were randomized to receive a meal with or without EVOO followed by a one week washout period, where they were given the other intervention. The primary outcome is the trans-meal blood glucose, which was calculated as the percent change in two-hour postprandial blood glucose. In group A, there was a noted 88.55% increase in two-hour postprandial blood glucose in taking meals with EVOO, versus 72.11% change in meals without EVOO. The same was observed in Group B, with a 71.08% and 49.22% increase in two-hour postprandial blood glucose in meals with EVOO and without EVOO, respectively. The difference was significant with a p-value of 0.044. Free fatty acids inhibit glucose transport and insulin secretion, this effect may be more predominant in asian type 2 diabetes mellitus patients. This study found that adding extra virgin olive oil on top of meals provided no additional benefit in terms of post-prandial glucose excursion.

Keywords: *Diabetes mellitus, Diet, Diettherapy, Fatmetabolism, Oliveoiltherapeuticuse, Medicine*

Factors associated with clinical competence in the gynecologic oncology subspecialty rotation of obstetrician-gynecologist (ob-gyn) residents

Dy Echo, Ana Victoria V.

This correlational study was conducted to determine whether factors of the Gynecologic Oncology subspecialty rotation – such as resident rotators' sex, year level, training institution, academic aptitude, duration of rotation, learning activities, case load, extent of involvement of teachers, and level of involvement of the residents – are associated with clinical competence. Thirty-one residents rotating in subspecialty were given MCQ examination and skills evaluation pre- and postrotation. Logbooks were completed listing all learning activities and number of cases encountered. Difference in scores was determined using paired t-test. Association of factors with clinical competence was determined using chi square and Pearson correlation coefficient. There was a statistically significant increase in the overall and skills scores, but not in the knowledge. Training institution, academic aptitude, and duration of rotation were associated with clinical competence. Conference, outpatient duty, case load, fellows as teachers and active participation were strongly associated with clinical competence. Bedside teaching, inpatient duty, and consultants as teachers were moderately associated with clinical competence. Passive participation was weakly associated with clinical competence. Overall, the residents did not achieve clinical competence in Gynecologic Oncology as a result of the rotation. Residents from a training institution with a Gynecologic Oncology fellowship training program and with academic aptitude > 60% are more likely to achieve clinical competence. Increasing rotation duration to > 2 weeks, time spent in the different activities, case load,

fellows and consultants interaction with residents, and active participation may increase likelihood of achieving clinical competence.

Keywords: *Clinical competence, Subspecialty rotation, Training institution, Academic aptitude, Year level, Duration of rotation, Learning activities, Case load, Fellows as teachers, Residents participation, Medicine*

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0458

Fertility preserving surgical approach to uterine arteriovenous malformation

Tan-Cardoso, II, German D.C. , Borja, Mirah D., Dela Cruz, Sheryl Ann B.

Arteriovenous malformations (AVM) are vascular disorders with a mixture of arterial, venous and small capillary-like channels with fistulous connections. Uterine arteriovenous malformations are rare cause of abnormal uterine bleeding with only a few reported cases. They may arise from pregnancy, miscarriage, previous cesarean section or other uterine surgery and gestational trophoblastic disease. Diagnosis can be made through angiography or doppler ultrasonography. Traditionally, uterine AVMs are treated with hysterectomy but with the advances in technology, minimally invasive conservative approaches such as radiologic arterial embolization or laparoscopic uterine artery ligation have become available. We present a case of a 29-year-old, G2P1 (1011) who had a three-month history of heavy, intermittent vaginal bleeding from uterine arteriovenous malformation after a miscarriage. Laparoscopic bilateral uterine artery occlusion, offered a minimally invasive treatment with high symptomatic effectiveness.

Keywords: *Abnormal uterine bleeding, Uterine artery ligation, Uterine arteriovenous malformation, Medicine*

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NP

0459

Fibroblast growth factor-23 is associated with high-density lipoprotein in systemic sclerosis female patients

Ortego-Centeno, Norberto , Callejas-Rubio, Jose Luis , Martin, Javier , Cantero-Nieto, Lucia , Garcia-Gomez, Jose Alberto

Fibroblast growth factor-23 (FGF23) is a circulating regulator of phosphate and vitamin D metabolism and has been implicated as a putative pathogenic factor in cardiovascular disease. The objectives of this study were: to compare serum FGF23 levels between systemic sclerosis (SSc) patients and healthy controls and to investigate possible associations between FGF23 and serum lipid profile in SSc patients. This cross-sectional study was performed in San Cecilio Hospital, Granada (Spain) from November 2017 to May 2019. We enrolled 62 consecutive female patients affected by SSc and 62 healthy women who served as controls. Cardiovascular risk factors and related biochemical parameters were collected. Serum FGF23 was analyzed using enzyme-linked immunosorbent assay (ELISA). Linear regression was used to examine the cross-sectional associations of serum FGF23 concentrations with high density lipoprotein-cholesterol (HDL-c). There was no significant differences in FGF23 levels between the patients and controls (78.2 ± 60.5 vs. 80.3 ± 56.3 pg/mL, $p = 0.662$), but we found a statistically significant inverse relationship between FGF23 and HDL-c measurements ($r = -0.27$; $p = 0.03$) in women with SSc. In addition, in the linear regression model, higher FGF23 concentrations were associated with lower HDL-c [$\beta = -1.45$ 95% CI (-2.81, -0.08); $p < 0.05$]. We report an association between circulating FGF23

and HDL-c in SSc female patients, representing a novel pathway linking high FGF23 to an increased cardiovascular risk.

Keywords: *Fibroblast growth factor-23, High-density lipoprotein, Systemic sclerosis, Medicine*

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0460

A fifteen-year report of serotype distribution and antimicrobial resistance of *Salmonella* in the Philippines

Sia, Sonia

Salmonella enterica ser. Typhi and *Salmonella enterica* ser. Paratyphi are agents of typhoid fever, a severe systemic disease, which remains to be a public health concern in the Philippines. Infection due to non-typhoidal *Salmonella* (NTS), on the other hand, most often results in a self-limiting acute gastroenteritis but may result in invasive disease in some cases. There is scarcity of information on the *Salmonella* serotypes in the Philippines which limits understanding of the distribution, transmission and antimicrobial resistance of these bacteria. This study describes the serotype distribution and antimicrobial resistance of *Salmonella* in the Philippines over a 15-year period. *Salmonella* isolates were collected through the Philippine Department of Health-Antimicrobial Resistance Surveillance Program (DOH-ARSP) from January 1, 2004 to December 31, 2018. The isolates were serotyped using Sven Gard method for slide agglutination using antigens from Denka Seiken (Japan), and S and A serotest (Thailand). Antigenic formula obtained were classified according to White-Kauffmann-LeMinor scheme. Antimicrobial susceptibility testing for ampicillin, ceftriaxone, cefotaxime, chloramphenicol, ciprofloxacin, and trimethoprim-sulfamethoxazole, were performed using both automated and conventional methods (Kirby Bauer disk diffusion and gradient diffusion method). Antimicrobial susceptibility results were interpreted using Clinical and Laboratory Standards Institute (CLSI) 2018 interpretive criteria (M100Ed28E). A total of 2,387 isolates were collected from human specimens during the 15-year study period. There were 69 serotypes of *Salmonella* identified with the most common being *Salmonella enterica* ser. Typhi: n=1895 (79.39%), *Salmonella enterica* ser. Enteritidis: n=182 (7.62%), *Salmonella enterica* ser. Typhimurium: n=87 (3.64%), *Salmonella enterica* ser. Weltevreden: n=24 (1.00%), *Salmonella enterica* ser. Paratyphi A: n=17 (0.71%), *Salmonella enterica* ser. Stanley: n=17 (0.71%), *Salmonella enterica* ser. Anatum: n=13 (0.54%), *Salmonella enterica* ser. Heidelberg: n=12 (0.50%), *Salmonella enterica* ser. Choleraesuis var. Kunzendorf: n=9 (0.38%). The multidrug resistant *Salmonella* serotypes reported in this study were mostly resistant to ampicillin, cefotaxime, ciprofloxacin combinations. This present study showed that prevailing *Salmonella* serotypes in the Philippines were similar with *Salmonella* serotypes reported from other Asian countries. Typhoidal isolates were high among 6-17 years old and were mostly from males. The antimicrobial resistance rates for typhoidal *Salmonella* isolates to ampicillin, chloramphenicol, trimethoprim-sulfamethoxazole, ciprofloxacin, ceftriaxone and cefotaxime were lower compared with the antimicrobial resistance rates for non-typhoidal *Salmonella* isolates. Multidrug resistance for both *Salmonella* Typhi and NTS were relatively low. Continued and enhanced surveillance is needed to monitor the rising levels of antimicrobial resistance, determine risk factors and exposures associated with *Salmonella* Typhi and NTS infection to guide prevention and control measures.

Keywords: *Salmonella typhi, NTS, serotype distribution, antimicrobial resistance, multi-drug resistance, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 1, 19-29
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A five-year review of the clinicopathologic profile of patients with hydatidiform mole at the Philippine General Hospital

Soriano-Estrella, Agnes L. , Cañete - Villarias, Sherry Joahne L.

The clinical presentation of patients with hydatidiform mole have changed in recent years due to earlier diagnosis as a result of widespread use of ultrasonography and availability of assays for human chorionic gonadotrophin. To determine the clinicopathologic profile of patients diagnosed with hydatidiform mole at the Philippine General Hospital from January 2013 to August 2018. This retrospective cross-sectional study included all patients with histologically confirmed diagnosis of hydatidiform mole managed at the Philippine General Hospital from January 2013 to August 2018. Medical records of patients were retrieved. All abstracted variables were analyzed retrospectively. The level of significance for all sets of analysis was set at p-value < 0.05 using two-tailed comparisons. From January 2013 to August 2018, a total of 435 patients diagnosed with hydatidiform mole were managed at the Philippine General Hospital with a prevalence rate of 15.7/1,000 pregnancies. Diagnosis was made in the first trimester in 52% of patients. A quarter of the patients had pre-evacuation B-hCG levels of more than 1 million mIU/mL. Vaginal bleeding was the most frequent presenting symptom but only 59% of the patients had anemia requiring blood transfusion. Majority (90.57%) had a histopathologic diagnosis of complete hydatidiform mole. The prevalence and clinicopathologic profile of patients with hydatidiform mole in the Philippine General Hospital have remained largely unchanged.

Keywords: *Hydatidiform mole, Gestational trophoblastic diseases, B-hCG, Clinicopathologic profile, Medicine*

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NP

Gastric pyloric gland adenoma: a case report, review of literature, and diagnostic challenges in the Philippine setting

Elomina, Kevin

Pyloric gland adenoma (PGA) is a rare neoplasm with definite malignant potential that is difficult to recognize because of its characteristically bland histology. We present a case of a 74-year old female with chronic, intermittent symptoms referable to gastroesophageal reflux, bloatedness, and frequent flatus, with family history of gastric cancer. Initial endoscopy was done and biopsy revealed an inflammatory pseudopolyp. After six months, repeat endoscopy showed multiple polyps at the cardia, and biopsy of one of the visualized polyps was done. Microscopic sections of the polyp show a neoplasm composed of discrete glands lined by simple cuboidal to columnar epithelial cells with amphophilic to eosinophilic cytoplasm without apical mucin caps, and mild nuclear atypia. Mild epithelial stratification is noted in some of the glands. PAS staining showed granular, cytoplasmic staining in tumor cells. Immunohistochemical staining with P53 showed focal, weak, nuclear staining in tumor cells. Staining with Ki67, MUC2, MUC5AC, and MUC6 were not done because the tissue had already been exhausted. The diagnosis of PGA with low-grade dysplasia has been made. The patient is apparently well, and is advised surveillance endoscopy at six-month intervals. PGA may be diagnosed in a limited resource setting, through thorough histologic examination, and use of special histochemical stains.

Keywords: *Pyloric gland adenoma, P53, Ki-67, GNAS, KRAS, Medicine*

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Gene cloning and characterization of thiourocane hydratase from *Burkholderia* sp. HME13

Muramatsu, Hisashi, Miyaoku, Haruna, Kurita, Syuya, Matsuo, Hidenori, Kashiwagi, Takehiro, Kim, Chul-Sa, Hayashi, Motoko, Yamamoto, Hiroaki, Kato, Shin-Ichiro, Nagata, Shinji

A novel enzyme, thiourocane hydratase, which catalyses the conversion of thiourocane acid to 3-(5-oxo-2-thioxoimidazolidin-4-yl) propionic acid, was isolated from the ergothioneine-utilizing strain, *Burkholderia* sp. HME13. When the HME13 cells were cultured in medium containing ergothioneine as the sole nitrogen source, thiourocane-metabolizing activity was detected in the crude extract from the cells. However, activity was not detected in the crude extract from HME13 cells that were cultured in Luria-Bertani medium. The gene encoding thiourocane hydratase was cloned and expressed in *Escherichia coli*, and the recombinant enzyme was purified to homogeneity. The enzyme showed maximum activity at pH 7.5 and 55°C and was stable between pH 5.0 and 10.5, and at temperatures up to 45°C. The K_m and V_{max} values of thiourocane hydratase towards thiourocane acid were 30 μM and 7.1 $\mu mol/min/mg$, respectively. The enzyme was strongly inhibited by $CuCl_2$ and $HgCl_2$. The amino acid sequence of the enzyme showed 46% identity to urocanease from *Pseudomonas putida*, but thiourocane hydratase had no urocanease activity.

Keywords: *Ergothioneine, Thiourocane acid, Thiourocane hydratase, Urocanease, Burkholderia, Abbreviations, 2-ME, 2-mercaptoethanol, IPTG, Isopropyl- β -D-thiogalactopyranoside, LB, Luria-Bertani, PMSF, Phenylmethylsulfonyl fluoride, UPLC, Ultra-performance liquid chromatography, Medicine*

The Journal of Biochemistry, Volume No. 167 Issue No. 3, 333-341
2020 March,
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F(S) QP501 J82 167/3 2020

Giant vulvar fibroepithelial polyp: a case series *Ang, Angeli Anne C., Festin-Dalawangbayan, Maria Anna Luisa*

Fibroepithelial stromal polyp, more commonly known as acrochordon, skin tag or soft fibroma is a type of mesenchymal tumor occurring among women of reproductive age. Fibroepithelial polyp, Although the most common cutaneous, is rare in the vulvovaginal region and there is currently no established protocol in approaching these kinds of lesions. Presented here is a series of cases of gradually enlarging labial masses, initially non-tender but later becoming associated with local pain. Diagnosis is mainly through history, clinical examination aided by ultrasonography, and histopathologic examination, which would show a central fibrovascular core covered with squamous epithelium. Surgical excision serves as both diagnostic and therapeutic modality for these lesions. Vulvar fibroepithelial polyp do not seem to be as rare as literature says, they are relatively easy to diagnose and presents with benign clinical course.

Keywords: *Acrochordon, Fibroepithelial polyp, Skin tag, Soft fibroma, Vulvar mass, Medicine*

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NP

High glucose inhibits osteogenic differentiation of bone marrow mesenchymal stem cells via regulating miR-493-5p/ZEB2 signalling

Zhai, Zhongshu , Chen, Wanhong , Hu, Qiaosheng , Wang, Xin , Zhao, Qing , Tuerxunyiming, Muhadasi

Diabetic osteoporosis (DOP) is attributed to the aberrant physiological function of bone marrow mesenchymal stem cells (BMSCs) under high glucose (HG) environment. MicroRNAs (miRNAs) are involved in the pathological processes of DOP. We aimed to explore the underlying mechanism of miRNA in DOP. BMSCs were cultured in osteogenic medium with HG to induce osteogenic differentiation, and the interaction between miR-493-5p and ZEB2 was assessed by luciferase assay. Herein, we found miR-493-5p is gradually reduced during osteogenic differentiation in BMSCs. HG treatment inhibits osteogenic differentiation and induces an up-regulation of miR-493-5p leading to reduced level of its downstream target ZEB2. Inhibition of miR-493-5p attenuates HG-induced osteogenic differentiation defects by upregulation of ZEB2. Mechanistically, miR-493-5p/ZEB2 signalling mediates HG-inhibited osteogenic differentiation by inactivation of Wnt/ β -catenin signalling. More importantly, knockdown of miR-493-5p therapeutically alleviated the DOP condition in mice. HG prevents BMSCs osteogenic differentiation via up-regulation of miR-493-5p, which results in reduced level of ZEB2 by directly targeting its 3'-untranslated region of mRNA. Thus, miR-493-5p/ZEB2 is a potential therapeutic target and provides novel strategy for the treatment and management of DOP.

Keywords: Bone marrow mesenchymal stem cells, High glucose, miR-493-5p osteogenic differentiation, ZEB2, Medicine

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High grade ovarian serous carcinoma associated with chronic schistosomiasis

Co, Jennifer T. , Marquez, Shiara Marriz T., Reyes, Lylah D.

Schistosomiasis has been established as a causative factor in urinary bladder, liver, colorectal and cervical cancer. However, its role in ovarian malignancy has not been described. With the premise that long-standing inflammation secondary to chronic infection predisposes to cancer by promoting an environment that cultivates genomic lesions and tumor initiation, we are left with an open question: Does chronic infection with schistosomiasis also predispose to ovarian cancer? In this paper, we presented a case of a 54-year-old diagnosed with high grade serous carcinoma of the ovary and fallopian tube with a history of chronic infection with Schistosomiasis. In this case, the infection caused neoplastic lesions in the right fallopian tube with subsequent seeding of malignant cells to the right ovary, indirectly causing the high grade serous ovarian carcinoma of the patient.

Keywords: Fallopian tube, Inflammation, Ovarian neoplasms, Schistosomiasis, Medicine

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 2, 40-44
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NP

Growing teratoma syndrome *Co, Geminelle Y., Zalameda-Castro, Carolyn R.*

Growing teratoma syndrome is a rare phenomenon. Presented is a case of a 36 year old, G2P2 (2002) who consulted for abdominal enlargement and subsequently underwent exploratory laparotomy, peritoneal fluid cytology, left salpingo-oophorectomy, right oophorocystectomy, infracolic omentectomy and random peritoneal biopsy. Histopathology revealed immature teratoma of the ovary, FIGO grade III, stage IIIC. She received adjuvant chemotherapy using Bleomycin, Etoposide, Cisplatin. After the second cycle of chemotherapy, new lesions were appreciated in the right ovary and at the cul de sac for which she underwent exploratory laparotomy, peritoneal fluid cytology, total hysterectomy with right salpingo-oophorectomy, tumor debulking, infragastric omentectomy, random peritoneal biopsy. Histopathologic study showed mature teratoma. No further treatment was given. Presently, patient has no evidence of disease for 5 months.

Keywords: *Chemotherapeutic retroconversion, Growing teratoma syndrome, Ovarian immature teratoma, Medicine*

A case report, Volume No. 44 Issue No. 3, 39-43
2020 May to June,
(Filipiniana Analytics)
NP

Two hearts, one rhythm: a case report on thoracoomphalopagus twins *Dosdos, Kristina L. , Martinez, Ma. Angelica Martha A.*

A 21-year old woman, G1P0, was referred for further prenatal check-up with sonographic examination revealing conjoined twins at 29 weeks age of gestation. The fetuses were in breech presentation positioned face-to-face with fusion at the level of the thoraces and gastric bubble suggestive of thoracoomphalopagus twins. There was a definite communication between the two fetal circulations at the ventricular level as seen on fetal echocardiogram with a single cardiac rhythm shared between the two hearts. Close antenatal and fetal surveillance was done during the entire pregnancy duration. The patient was counseled about therapeutic options and explained of the complexity of their cardiac anatomy. The twins were delivered by cesarean section at 35 weeks due to preterm labor and a neonatal 2D-echocardiogram was done shortly after to re-assess their cardiac anatomy. Since the results revealed a shared ventricle, the twins were considered inseparable. The family was apprised of their poor prognosis and opted for natural death to occur.

Keywords: *Thoracoomphalopagus twins, Conjoined twins, Medicine*

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2016 March,
(Filipiniana Analytics)
NP

Hemichorea-hemiballism syndrome caused by nonketotic hyperglycemia in a newly diagnosed diabetes mellitus type 2 patient with euglycemia at presentation *Tancongco, Tisha Gay C., Lim, Rossini Abbie*

Nonketotic hyperglycemia among type 2 diabetic patients have recently been documented to cause the rare movement disorder called Hemichorea-hemiballism syndrome which is a hyperkinetic movement disorder

presenting as a continuous, non-patterned, involuntary movements caused by a basal ganglia dysfunction. A 76-year-old male with a known history of hypertension and no history of stroke and diabetes presented with a 10-day history of increasingly persistent involuntary movements of the right extremities. On admission, the patient was conscious with stable vital signs and unremarkable neurologic findings except for the involuntary flailing movements of the right extremities. Diagnostic testing revealed first documentation of hyperglycemia with brain MRI changes on T1 hyperintensity signals on the basal ganglia and T2/FLAIR weighted imaging showing mixed hypointense and hyperintense signals which is a classical MRI finding in patients with HC-HB syndrome caused by nonketotic hyperglycemia. The patient was treated for diabetes and was maintained on anti-dopaminergic medications for the uncontrollable involuntary movements. After five months, resolution of the hemiballism-hemichorea syndrome was noted after appropriate treatment. This case report highlights hemichorea-hemiballism syndrome in a newly diagnosed type 2 diabetic patient who had normal glucose levels at presentation. The prompt recognition and correction of uncontrolled newly diagnosed diabetes and administration of anti-dopamine agents lead to a rapid improvement of symptoms, less neurologic sequelae and an overall favorable prognosis.

Keywords: *Hemichorea-hemiballism, Nonketotic hyper-glycemia, Basal ganglia, Diabetes mellitus type 2, Movement disorder, Case report, Medicine*

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NP

0470

Herlyn Werner Wunderlich syndrome: a report of two cases

Alensuela, Anna Belen I. , Munoz Morante, Catherine Mae

The association of renal agenesis with ipsilateral blind hemivagina and uterus didelphys as Herlyn-Werner-Wunderlich (HWW) syndrome. Presented herein are two cases of HWW syndrome, each with different set of clinical presentation both with the same arranged diagnostic method and management executed. The first case, a 15 year-old nulligravid, manifested severe dysmenorrhea since menarche and is worsening over the past months. On the other hand, the second case, a 29 year-old Gravida 1 Para 0 (0010), exhibited cyclic hypogastric pain and gradually enlarging right pelvic mass. Both cases underwent computed tomography scan and ultrasound examination which revealed uterine didelphys, hemivagina obstruction and ipsilateral renal agenesis, yet each has different laterality of mullerian anomaly. Together were managed with full resection of the vaginal septum as well as drainage of the hematometrocolpos, which are, today, the main treatment for patients with HWW syndrome.

Keywords: *Herlyn-Werner-Wunderlich syndrome, Blind hemivagina, Uterus didelphys, Hematometrocolpos, Medicine*

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NP

0471

Histologic transformation in an EGFR-mutant lung cancer in a Filipino patient treated with afatinib: a case report and review of literature

Tamayo, Steffanie Charlyne

We report a case of a 64-year-old Filipino male who initially presented with chronic cough, easy fatigability, and weight loss. Work-ups lead to a diagnosis of lung adenocarcinoma with epidermal growth factor receptor (EGFR) exon 19 deletion. Patient was placed on targeted therapy with Afatinib. He was able to complete 17 months of targeted therapy with relatively stable disease before experiencing recurrence of easy fatigability. Work-ups then

lead to a diagnosis of a high-grade neuroendocrine tumor consistent with small cell lung carcinoma (SCLC). Afatinib was then discontinued and the patient was started on Carboplatin and Etoposide. However, after only one cycle, the patient's symptoms progressed and the patient eventually expired. Histological transformation of EGFR-mutant adenocarcinoma to SCLC as a mechanism of resistance to targeted therapy has been documented in literature since 2006. However, to our knowledge, this is the first fully-documented case of histologic transformation occurring in a Filipino patient. As molecular targeted therapy and immunotherapy become standard-of-care in our country, it is of paramount importance that clinicians and pathologists are aware of the various mechanisms of resistance that can occur as a result of these treatments.

Keywords: lung cancer, adenocarcinoma, small cell carcinoma, receptor, epidermal growth factor, cell transformation, neoplastic, Medicine

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0472

Honey as an alternative management of vulvar ulcers in a young patient with Behcet's Syndrome

Fallarme, Analyn F. , Ursabia, Germaine Angela C.

This is the case of a 19 year-old woman who presented with recurrent vulvovaginal, cervical and oral ulcers. In addition to steroid treatment, she underwent surgical wound debridement followed by topical treatment of the lesions with honey which showed favorable results. The aim of this case report is to present the wound healing properties of honey since there are no previously documented case on honey as a treatment in Behcet's ulcers.

Keywords: Behcets Syndrome, Honey, Ulcers, Medicine

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 3, 37-40
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NP

0473

Hugs for keeps: a case report of pessary insertion in preterm twin gestation in the Philippines

Pasamba, Koleen C., Panlilio Vitriolo, Regina Rosario M.

Preterm birth accounts to 35 % of deaths in a year. Twin gestation, around 7.2 per 1000 births in the Philippines, is a known risk factor that increases likelihood of preterm birth compared to singletons. Most studies that addresses preterm births are focused on singleton pregnancies. There have been no established recommendations to control preterm labor in twin pregnancies. Pessary insertion is among these recommendations. There are no reported cases of pessary insertion to control preterm birth among twins in the Philippines. This study presents a case of twin gestation in preterm labor and no functional cervix on transvaginal ultrasound. Hodge pessary was inserted at 28 weeks age of gestation. She delivered at 36 weeks to live baby girls, both 2,200 grams and were directly roomed-in. Further studies are recommended to establish stronger evidence supporting pessary use in multiple gestation to improve outcome of neonates.

Keywords: Pessary, Preterm birth, Preterm labor, Twin pregnancy, Medicine

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 6, 33-38
2019 November to December,
(Filipiniana Analytics)

Human chorionic gonadotropin surveillance in hydatidiform mole: a need for reevaluation

Soriano-Estrella, Agnes L. , Mendoza, Marie Christine Valerie R., De Quiros, Melissa Lourdes B.

Serial beta human chorionic gonadotropin (β hCG) monitoring after molar evacuation is advised for early detection of persistent trophoblastic disease. The aim of this study was to determine the percentage of patients who developed post-molar gestational trophoblastic neoplasia during a 6-month follow up period after normalization of β hCG titers to that during a 12-month follow up period in order to ascertain the appropriate period of β hCG surveillance for patients who underwent treatment for molar pregnancy. Data was analyzed from the Section of Trophoblastic Diseases at the Philippine General Hospital - Department of Obstetrics and Gynecology to estimate the incidence of persistent trophoblastic disease among 258 women with molar pregnancy from 2000-2011. Among the 258 registered hydatidiform mole patients, 205 patients (79.5%) attained normal β hCG titers titer levels after evacuation of molar products. There was no occurrence of postmolar gestational trophoblastic neoplasia among patients who achieved normalization of β hCG titers after treatment. β hCG levels did not attain normalization following evacuation in 53 patients (20.5%). Out of the 53 patients, 50 patients (94.3%) were detected to have gestational trophoblastic neoplasia within the first six months post-treatment. Only 3 patients (5.7%) were determined to have disease progression after six months during the one-year follow-up period. The follow-up period after a molar pregnancy may be reduced for patients whose serum β hCG levels spontaneously decline to normal levels after evacuation. The results of this study showed that the median time to obtaining normal β hCG levels is 88 days for those who received chemoprophylaxis and 85 days for those with lower initial β hCG values (less than 100, 000 mIU/ml).

Keywords: *Human chorionic gonadotropin, Hydatidiform mole, Surveillance, Medicine*

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NP

Hypermetabolism of glutathione, glutamate and ornithine via redox imbalance in methylglyoxal-induced peritoneal injury rats

Hirahara, Ichiro , Kusano, Eiji , Jin, Denan , Takai, Shinji

Peritoneal dialysis (PD) is a blood purification treatment for patients with reduced renal function. However, the peritoneum is exposed to oxidative stress during PD and long-term PD results in peritoneal damage, leading to the termination of PD. Methylglyoxal (MGO) contained in commercial PD fluids is a source of strong oxidative stress. The aim of this study was to clarify the mechanism of MGO-induced peritoneal injury using metabolome analysis in rats. We prepared peritoneal fibrosis rats by intraperitoneal administration of PD fluids containing MGO for 21 days. As a result, MGO-induced excessive proliferation of mesenchymal cells with an accumulation of advanced glycation end-products (AGEs) at the surface of the thickened peritoneum in rats. The effluent levels of methionine sulfoxide, an oxidative stress marker and glutathione peroxidase activity were increased in the MGO-treated rats. The levels of glutathione, glutamate, aspartate, ornithine and AGEs were also increased in these rats. MGO upregulated the gene expression of transporters and enzymes related to the metabolism of glutathione, glutamate and ornithine in the peritoneum. These results suggest that MGO may induce peritoneal injury with mesenchymal cell proliferation via increased redox metabolism, directly or through the formation of AGEs during PD.

Keywords: *Glutaminolysis, Glutathione, Methylglyoxal, Peritoneal dialysis, Redox, Medicine*

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2020 February,
(Filipiniana Analytics)

Idiopathic central precocious puberty: a case report

Dichoso, Marian C., dela Rea, Mariel Anne C.

Central precocious puberty is characterized by early pubertal changes, acceleration of growth velocity, and rapid bone maturation. It is a relatively rare disorder, with an incidence rate of about 1 : 5000 – 1 : 10 000 individuals in the general population; it is more frequent in girls than in boys. This is a case of a 7 year-old female complaining of onset of menstruation. Physical examination revealed advanced pubertal changes of Tanner stage 4-5 for breast and stage 3 for pubis. Diagnostic evaluation revealed well developed internal genitalia, markedly elevated LH levels, advanced bone aging and a normal cranial MRI. Based on clinical and diagnostic evaluations, a diagnosis of idiopathic central precocious puberty was made and the patient was started on GnRHa therapy. It is important to initiate therapy early in patients with central precocious puberty so as to prevent compromised adult height and psychosocial embarrassment.

Keywords: *Precocious puberty, Central precocious puberty, Idiopathic central precocious puberty, Medicine*

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NP

Impact of mother-baby friendly hospital initiative in a tertiary hospital on success of breastfeeding: a prospective cohort study

Holgado, Polla Lorence K., Mercado, Wilhelmina A.

To determine the impact of Mother-Baby Friendly Hospital Initiative (MBFHI) implementation on the success of breastfeeding practices among patients who gave birth in a tertiary hospital. Seventy-one postpartum patients who have no contraindications to breastfeeding were recruited from September-November 2017. Outcome variables regarding on the success of breastfeeding initiation on the first hour postpartum and hospital stay were measured. Participants were followed-up by phone call at 3 and 6-months postpartum to determine their practice on exclusive breastfeeding. The exclusive breastfeeding (EBF) rates at first hour postpartum, during hospital stay, 3 and 6 months were 91.5%, 81.7%, 65.9%, and 45.5%, respectively. The participants who had cesarean delivery and vaginal delivery were 19 (26.8%) and 52 (73.2%) respectively. There was no significant association between the route of delivery and successful breastfeeding at first hour ($p = 0.179$). At first hour postpartum, majority of the infants who did not initiate breastfeeding was due to respiratory distress. At 6 months, only 39% (26 out of 66) did proper breastfeeding. There were 26 out of 66 (39%) subjects who have work at 6 months, and among these, 12 subjects were not able to collect and store milk due to unavailability of lactation clinic at their workplace. Overall, approximately half of the subjects who initiated EBF were not able to continue EBF until 6 months due to inadequate milk production and resumption of work. Half of mothers exclusively breastfed up to 6 months, regardless of age, parity and route of delivery. The main determinants of EBF cessation at 6-month postpartum include inadequate milk production, resumption of work and inability to collect milk. To promote successful EBF among mothers in the Philippines, interventions should focus on strengthening the breastfeeding policy implementation in the workplace and communities to promote, protect and maintain breastfeeding.

Keywords: *Exclusive breastfeeding, Exclusively breastfeeding working mothers, Proper breastfeeding, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 1, 1-7
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(Filipiniana Analytics)
NP

Impact of revised management policies on the efficiency of gynecologic operating room processes in a tertiary training hospital

Llave, Cecilia L. , de Guzman, Glaiza S.

A retrospective observational time motion study of elective gynecologic surgeries performed from January 2015 to December 2016 was conducted at the Operating Room Complex of a tertiary training hospital. There was a change from three operating suites with standard last stitch time in 2015 to only two with no cutoff times in 2016. This was due to the renovation of the Operating Room Complex. To determine the factors and problems affecting operating room processes Different time motion parameters such as induction time, length of induction, cutting time, last stitch time, total operation time, turnover time, and number of cases performed were collected from the nurses' documentation records. Average values from two different time periods were compared and analyzed. Results showed no improvement with the revised policies implemented in 2016. With only two rooms, surgeons were able to cope with the number of patients by extending operating hours later through the day. Recurring problems on manpower and lack of resources were noted. There is a need to identify hindrance to efficient operating room utilization with the goal to decrease patient queue, improve patient as well as staff satisfaction, and increase hospital revenue. Multi-disciplinary changes in practices, processes, and attitudes are timely for improvements in operating room utilization and consequently better patient centric outcomes.

Keywords: *Efficiency, Operating room, Time motion study, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 5, 20-26
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NP

Three in a row: a case series of cervical tuberculosis

Sianghio, Angelynn Santos, Espino-Strebel, Elizabeth E.

Cases of cervical lesions have been rising steadily in the past decades. From inflammation to carcinogenesis, the cervix is never really spared of disease. In the presence of a cervical mass, malignancy is always a consideration. In this paper, we present three cases of cervical tuberculosis that were diagnosed in a tertiary private hospital in Pasay City. Women in their 3rd and 4th decade of life presenting with post coital spotting, copious vaginal discharge and amenorrhea were examined: The cervix was converted to a nodular friable mass, with extension to the fornices. On rectovaginal exam, both parametria were nodular but free from the pelvic sidewall. The primary consideration was a probable cervical carcinoma stage IIB. On tissue biopsy and further testing, cervical tuberculosis was confirmed. Quadruple anti-Koch's therapy was initiated, to which clearing of the cervix with decrease discharge was noted.

Keywords: *Anti-Kochs therapy, Cervical tuberculosis, Epitheloid cells, Langhans Giant cells, Tuberculosis (TB), Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 5, 41-46
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NP

Interleukin-6 confers radio-resistance by inducing Akt-mediated glycolysis and reducing mitochondrial damage in cells

Kumari, Neeraj , Das, Asmita , Bhatt, Anant Narayan

Interleukin-6 (IL-6)-induced glycolysis and therapeutic resistance is reported in some cell systems; however, the mechanism of IL-6-induced glycolysis in radio-resistance is unexplored. Therefore, to investigate, we treated Raw264.7 cells with IL-6 (1 h prior to irradiation) and examined the glycolytic flux. Increased expression of mRNA and protein levels of key glycolytic enzymes was observed after IL-6 treatment, which conferred glycolysis dependent resistance from radiation-induced cell death. We further established that IL-6-induced glycolysis is activated by Akt signalling and knocking down Akt or inhibition of pan Akt phosphorylation significantly abrogated the IL-6-induced radio-resistance. Moreover, reduction of IL-6-induced pAkt level suppressed the expression of Hexokinase-2 and its translocation to the mitochondria, thereby inhibiting the glycolysis-induced resistance to radiation. IL-6-induced glycolysis also minimized the radiation-induced mitochondrial damage. These results suggest that IL-6-induced glycolysis observed in cells may be responsible for IL-6-mediated therapeutic radio-resistance in cancer cells, partly by activation of Akt signalling.

Keywords: *Akt signalling, Glycolysis, Hexokinase-2, IL-6, Radio-resistance, Medicine*

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2020 March,
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Intracervical foley catheter balloon versus oxytocin infusion as pre-induction cervical ripening agent in live term pregnancies with unfavorable cervixes

Villareal-Fortaleza, Angelica , Castillo-Celabrados, Charisse Dyan

The purpose of this study was to evaluate the effectiveness and safety as well as maternal and fetal outcome of intracervical Foley catheter balloon versus oxytocin infusion as pre-induction cervical ripening agents in live term pregnancies with unfavorable cervixes. Forty-two patients who fulfilled the induction criteria were randomized to 2 groups. Group 1= intracervical balloon catheter and Group 2 =oxytocin infusion. Both groups were compared as to: insertion/infusion to active phase interval, induction to delivery interval, uterine hyperstimulation, pain intensity, delivery and fetal outcome. Analysis of data collected was done using Independent T-test. Statistical analysis showed no significant difference as to insertion/infusion to active phase interval (p 0.814) and induction to delivery interval (p 0.264) between the balloon and oxytocin groups. By percentage comparison, both groups have comparable results in the mode of delivery, likelihood of cesarean section and good fetal outcome. Statistical significance was observed with regards to absence of uterine hyperstimulation (p 0.036) and absence of pain (p 0.000) in favor of the balloon group. By percentage comparison, intracervical Foley catheter balloon and oxytocin were both effective and safe in achieving cervical dilatation. The Foley catheter showed statistical significance in terms of absence of uterine hyperstimulation and pain. Foley catheter is readily available and affordable. It may be considered as a good alternative to oxytocin.

Keywords: *Cervical ripening, Foley catheter, Induction of labor, Oxytocin, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 40 Issue No. 4, 7-12
2016 December,
(Filipiniana Analytics)
NP

Intramyometrial oxytocin in preventing postpartum hemorrhage during cesarean delivery: a systematic review

Gonzaga, Florante P. , Guerra-Calilung, Joanna Marie O.

Postpartum hemorrhage from uterine atony, a major global and local health burden, remains to be a leading cause of maternal mortality. Intravenous oxytocin infusion has become the conventional first-line drug in the active management of third stage of labor in most countries. This, however, has been associated with refractory uterine atony and major hemodynamic side effects; hence the need to explore on the possibility of a better alternative such as intramyometrial oxytocin administration. The study aims to evaluate the efficacy and safety of intramyometrial oxytocin in preventing postpartum hemorrhage during cesarean deliveries. A review was done involving electronic search of databases for randomized clinical trials published since 1980, and a check of all the references according to inclusion and exclusion criteria. Four full articles were retrieved and assessed for methodological quality. Data were extracted and analyzed. Comparisons involved (1) intramyometrial versus intravenous oxytocin, and (2) intramyometrial oxytocin against intramyometrial carboprost. Limited evidence showed significant reduction of postpartum hemorrhage (RR 0.40; 95% CI 0.19 to 0.82) and maternal adverse drug events (RR 0.10; 95% CI 0.01 to 0.75) with intramyometrial oxytocin compared to intravenous oxytocin. Maternal adverse events were reduced, but not significantly, in intramyometrial oxytocin compared with intramyometrial carboprost. Guideline changes could not be recommended because there is insufficient information about intramyometrial oxytocin administration from the small number of studies and participants available.

Keywords: *Intramyometrial, Myometrial oxytocin, Cesarean section, Prophylaxis, Postpartum hemorrhage, Uterine atony, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 1, 12-23
2015 March,
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Isolated metastasis to the uterine cervix from primary breast carcinoma: a case report

Aquilizan, Leo Francis N. , Toh, Joan Marice C.

Metastasis of malignancy to the uterine cervix is a rare event in itself. Breast cancer is a commonly diagnosed malignancy in women that has been extensively studied, and it has been known that common areas of metastasis are the lungs, skin, liver and brain. Since the 1980s, there have been a handful of reported cases of metastasis to the uterine cervix. We present the case of a 64-year-old Gravida 4 Para 1 (1031) who developed postmenopausal bleeding 9 years after treatment of the primary breast cancer, which after work-up, turns out to be an isolated metastatic lesion to the cervix. In cases such as this one, surgery is a reasonable treatment option that is sufficient in itself without the need for chemotherapy or radiation. Our patient was offered a different treatment option, which is chemotherapy, instead of proceeding straight to the treatment option presented by most case reports, which is surgery. This paper aims to highlight a possible route of metastasis, to emphasize the need for regular gynecological examination in patients with breast cancer, as well as the importance of aggressive treatment in the form of surgery in cases of isolated cervical metastasis.

Keywords: *Breast cancer, Cervical metastasis, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 5, 34-42
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(Filipiniana Analytics)
NP

It's complicated: a case report of a patient with colo-cutaneous fistula connected to the appendiceal stump

Campos, Helen Joyce B. , Riel, Antero O. , Sy-Cocjin, Therese Angeli , Ting, Frederic Ivan L.

Colo-cutaneous fistula is a very rare complication of colonic diverticular disease, occurring in approximately one percent of cases either spontaneously or after surgical or drainage procedure. Herein we describe a patient with a colo-cutaneous fistula from the sigmoid to the appendiceal stump in a post-appendectomy patient which also exits to the skin at the post-operative site. The patient is a 76-year-old Filipino male who had appendectomy five months earlier and a history of diverticulitis, and presented with a subcutaneous abscess at the post-operative site. The abscess was drained, a colo-cutaneous fistula was radiographically established, and the surgical site was explored. Intraoperative findings showed the presence of multiple colonic diverticuli and a sigmoid-cutaneous fistula on the right lower abdominal quadrant. Interestingly, an incidental descending colon mass was also noted at the splenic flexure measuring approximately 2x3 cm to which frozen section revealed adenocarcinoma which was not seen in pre-operative CT scans. An extended left hemicolectomy was performed, and no postoperative complications were noted. At present three years later, he fares well without any signs and symptoms of the disease. Diverticulitis is a common condition in the older age group that needs to be considered in patient management. Colo-cutaneous fistula may be a rare complication of the disease but should be part of our differentials as internists in working up patients presenting with persistently draining superficial wound that either occurs spontaneously or post-operatively. Patients with diverticulitis also have increased risk of colorectal cancer and diagnostic imaging may not always differentiate the two entities, thus colonoscopy should be done if possible.

Keywords: *Colo-cutaneous fistula, Appendiceal stump, Diverticulitis, Case report, Medicine*

Philippine Journal of Internal Medicine, Volume No. 58 Issue No. 1, 42-45
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(Filipiniana Analytics)
NP

Juvenile granulosa cell tumor of the ovary presenting as isosexual precocious puberty: a case report

Soriano-Estrella, Agnes L. , Tingne, Cyriel Anthony I.

Isosexual precocious puberty is rare and a thorough investigation must be done in order to identify the cause of the precocity. This paper presents the case of a 4 year-old girl who was brought to the emergency room due to vaginal bleeding associated with onset of secondary sexual characteristics. Estradiol and anti-Mullerian hormone levels were elevated. Abdominal ultrasound revealed an abdominopelvic mass probably an ovarian new growth with benign sonologic features. Computer tomography of the brain with contrast showed normal findings. Elective surgery was planned after correction of the anemia and other causes of precocious puberty were excluded. She underwent an exploratory laparotomy and left salpingo-oophorectomy with frozen section. Final histopathology report showed juvenile granulosa cell tumor of the left ovary.

Keywords: *Juvenile granulosa cell tumor, Precocious puberty, Ovarian tumor, Pediatric endocrinology, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 39 Issue No. 3, 28-33
2015 September,
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NP

Knowledge, attitude and practice of Filipino gynecologists on menopausal hormonal therapy: where are we now?

Villafuerte, Mary Grace M., Soriano-Estrella, Agnes L.

This study evaluated the knowledge, attitude and practice of Filipino gynecologists towards hormonal therapy for menopausal symptoms. This was a cross-sectional study carried out among practicing Filipino gynecologists in different regions of the Philippines from April to October 2018. A self-administered questionnaire was used to identify the current knowledge, attitude and practice of gynecologists regarding the use of hormonal replacement therapy. There were 369 respondents included in the study. Our findings indicate that the most common indication for MHT are vasomotor symptoms and vaginal dryness. Almost all Filipino gynecologists participating in this study were aware that MHT will improve vasomotor and urogenital symptoms, sexual dysfunction and mood. Majority of them correctly agreed that MHT will decrease the risk of osteoporosis and coronary artery disease. On the other hand, at least half of the respondents falsely believed that MHT can decrease the risk for cognitive dysfunction, cerebrovascular disease, Parkinson's disease and vascular thrombosis. Only 68% of the respondents agreed that they have adequate knowledge about the treatment options for postmenopausal symptoms and as much as 32% of them are still not confident with their knowledge. Majority (65%) of Filipino gynecologists do not routinely recommend or offer the use of MHT to every postmenopausal woman. The knowledge and attitude of gynecologists on hormonal therapy play an important role in the decision making of a woman during her climacteric period. Basic knowledge on menopausal symptoms and indications for hormonal therapy are known to the respondents but these knowledge do not translate to practice.

Keywords: *Hormone replacement therapy, Menopause, Postmenopause, Medicine*

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(Filipiniana Analytics)
NP

Knowledge, attitude, and practice on human papillomavirus vaccination among obstetrics and gynecology residents in Metro Manila

Benavides, Doris R. , Decena, Katrina Immaculada F.

Human Papilloma Virus (HPV) has been known to be an important factor in the development of cervical cancer. In 2006, two vaccines were made available in the Philippines, one covering two subtypes (HPV 16 and 18) and the other covers four subtypes (HPV 6, 11, 16 and 18) of the virus. This study aimed to determine the current knowledge, attitude, and practices of obstetrics and gynecology residents from both government and private sector regarding HPV vaccination as well as determine barriers to vaccination. It also aimed to determine if there is any disparity between the private and government setting, and between residency year levels which may create a discrepancy in the vaccination coverage of their patients. Data will be collected through a self-administered questionnaire. The survey to be used in this study was adapted from the form used in a similar study done in Hong-Kong. The questionnaire will consist of five sections: 1) items regarding the respondents' demographics (age; sex; institution type; residency training year level; number of patients seen in a typical week; number of patients seen in a week aged 10-17, 18-26, and 27-45; number of pap smears performed in a typical week), 2) Knowledge on human papillomavirus infection, 3) Attitude towards HPV vaccine, 4) HPV vaccination practice, and 5) Perceived barriers in HPV vaccination. This study found that the knowledge of residents about human papilloma virus was generally poor to fair with no significant difference between the knowledge of residents from government institutions compared to those from the private sector. Majority of the residents believe that the vaccine should be administered to 10-17 years old, prior to sexual debut and exposure to the human papilloma virus but were not able to prescribe vaccination for this age group. The perceived barriers of residents in prescribing and vaccinating their patients differ between age groups. For 10-17 years old, parental refusal for vaccinating their children is due to the notion that in doing so, their child is being singled out as being at risk for sexually transmitted diseases. For patients 18-26 years old, residents believe that their reluctance to discuss and talk about issues of sexuality are likely to hinder them from getting vaccinated. For the 27-45-year-old age group,

the residents believe that the patient's belief that they do not have HPV infection is likely to hinder them being vaccinated. Proper education and good communication skills among residents and patients should be developed to properly employ and promote vaccination.

Keywords: *Human Papilloma Virus, HPV vaccination, Cervical Cancer, Medicine*

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0488

Knowledge, attitude and practices of obstetrician-gynecologists in screening for postpartum depression and psychosis in a private tertiary hospital

Nano-De Guzman, Nerissa, Cang, Santi Rex G.

Postpartum Depression (PPD) and psychosis (PPP) are diseases that have detrimental impact to the patient and their family. Prenatal and postpartum screening are important to decrease its morbidity, hence obstetricians and gynaecologists' (OBGYN) role in the diagnosis is vital. However, studies showed that the screening rate of PPD and PPP are low, which may be caused by several barriers. This study aims to describe the knowledge, attitude and practices of the OBGYN's practicing in a local tertiary hospital using a survey created by Leddy et al. in 2011. This survey is a 5-section questionnaire that tackled the clinical practice, knowledge, beliefs and attitudes of the subjects. It was given to 160 consultants with a response rate of 40% (n=64) during the time period of May 17, 2018 to June 27, 2018. The results showed that most OBGYN do not routinely screen for PPD and PPP (54.69%), which is analogous to literature but contrary to the original study. Most OBGYN agree that all the specified barriers to screening were limiting, the most cited among of which were their limited knowledge in the diagnostic criteria (PPD: 79.69%, PPP: 79.56%) and treatment options (PPD: 76.56%; PPP: 78.13%) and their lack in training in postpartum mental illnesses (PPD: 78.13%; PPP: 84.38%). These barriers were paralleled by the low scores in the knowledge section, despite the higher accuracy in diagnosing patients in the clinical cases. However, there was a low frequency screening rate among OBGYN's with recent and personal experience with the disease. This gap in knowledge can be addressed by organizing events for continuing medical education, focusing on peripartum mental health illnesses, creating avenues for research to increase knowledge among residents-in-training and fellows of the local organizing body, and establishing clear guidelines to incorporate screening in local practice during prenatal and postpartum care.

Keywords: *Depression, Gynaecologists, Obstetricians, Postpartum, Psychosis, Medicine*

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NP

0489

Knowledge, attitude and practices of obstetricians and gynecologists on non-invasive prenatal testing with cell free fetal DNA in a private tertiary hospital

Panes, Kristel Danica P., Cruz-Javier, Gumersinda

There are a number of novel prenatal cytoogenetic analysis tests for obstetricians and gynecologists on detecting aneuploidies. In the recent years, screening of pregnant patients with non-invasive prenatal testing (NIPT) is one. As the spread of genomic medicine and preventive obstetrics continue, it is prudent for obstetricians and gynecologists to accept and optimize new screening modalities, whenever available. Chromosomal abnormalities are common. Worldwide, one out of 150 live births may involve chromosomal abnormalities. The American College of Obstetrics and Gynecologists (ACOG) and American College of Medical Genetics recommend

invasive and non – invasive prenatal testing (NIPT)³. The invasive testing, however, carries risk for procedure – related miscarriage. ⁴This favors NIPT which avoids the risk. The current state of NIPT in the Philippines, is it was only in January 2018, were a NIPT workshop was conducted by the Society of Maternal Fetal Medicine.⁶ First, due to the minimal studies on personalized and precision medicine on prenatal testing, hence the strong move to conduct this study. In an extensive literature search review in Herdin, a local database and archives of Philippine Obstetrics and Gynecology, none specified researches on non – invasive prenatal testing. Second, in our country alone, there is no provision for national prenatal tests. In our institution, it was already introduced but with no uptake yet. Because of this gap, scantiness and non - uptake on NIPT locally, hence the conduct of this study. The study aimed to investigate on the obstetricians and gynecologists (OB-GYNs) knowledge, attitude towards and practices (KAP) about NIPT. Majority of the OBGYNs were knowledgeable, had positive attitude and were practicing NIPT. Strikingly, a fourth of the respondents were not comfortable in explaining NIPT. The researcher recommends that there is a need to conduct this study on a larger scale cross - sectional survey and multiple studies due to the paucity of data.

Keywords: *Non-invasive prenatal testing (NIPT), Cell free fetal DNA(CffDNA), Screening, Prenatal diagnosis, Medicine*

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NP

0490

Knowledge, attitude and practices towards menopause and hormone replacement therapy among the employees and ob-gyne patients in a tertiary hospital at Manila, Philippines

Roque-Igualada, Arby Jane, Manalo, Eileen M.

Life expectancy of women already increased up to 75 years old, and so women will live 1/3 of their lives during the menopausal period. Medical intervention at this point of life should be regarded as an opportunity to provide and reinforce programs of preventive health care to prepare women to this stage, and so it is important to address perceptions of women regarding menopause and HRT. To explore the knowledge, attitude and practices of Filipino women towards menopause and hormone replacement therapy A clinical descriptive cross-sectional study was conducted from May to November 2018 among a random 250 employees and patients from Philippine General Hospital. Respondents were asked to answer a validated questionnaire regarding their knowledge, attitude and practices towards menopause and hormone replacement therapy (HRT). The average age of menopause is 48 years old. The top most common symptoms perceived were easy fatigability, mood swings, hot flushes, loss of capacity in engaging in sexual activities, and loss of sexual desire. Half of them (53%) have fair self-rating knowledge on menopause, only 30% have knowledge on HRT and more than half (131=52%) of them have no knowledge at all about HRT. Forty percent answered that they learned it from their doctors. Among the menopause patients, only 9 have taken HRT, and mostly given by a specialist in a public hospital. At least 7 in ten respondents had correct knowledge on menopause but only 14-33% had correct answer on HRT. Almost 70% of the respondents were “undecided” with the statements regarding their perception on HRT, which is consistent with the fact that they don’t even know what HRT means. When asked on practices on menopause, 81% agreed that consulting a doctor for menopause is necessary, and 78% agreed that if HRT was prescribed, they would comply with it. However, only 60% had actually seen a doctor for menopausal symptoms. Only less than half of the respondents would use HRT even if it would cause them relief of symptoms and good health outcome. This is also consistent with the fact that they are not familiar with HRT and the benefits they would get from it. Majority of women have fair knowledge on menopause but almost none on HRT. Women are not familiar with the benefits they would get from HRT, but there’s a high percentage of women (78%) who will take HRT if prescribed by their doctors. There is a need to strengthen menopausal programs in the country to be able to fill in the gap towards knowledge on menopause and especially HRT.

Keywords: *Menopause, Hormone replacement therapy, Medicine*

Knowledge, attitudes, and practices of Filipino clinical practitioners regarding fertility preservation in cancer patients

Novero, Jr., Virgilio M. , Factor, Patricia Ann A.

Treatments for cancer have negative impact on fertility. Presently, there are technologies available to preserve the fertility of cancer patients even before gonadotoxic treatment is given. Several clinical practice guidelines on fertility preservation interventions for cancer patients have already been released. Among developed countries, Oncofertility is already an established field of clinical practice. This study aims to determine the knowledge, attitudes, and practices of Filipino clinical practitioners on fertility preservation in cancer patients. This was a cross-sectional study carried out between June and September 2019 using a self-administered questionnaire. The questionnaires were sent to clinicians (medical oncologists, hematologists, surgical oncologists, and radiation oncologists) who were directly involved in the treatment patients with cancer. There were 213 respondents composed of 91 surgical oncologists (varied subspecialties), 81 medical oncologists, and 41 radiation oncologists. Most of the clinical practitioners, 58-85%, have not encountered patients who have availed of any fertility preservation method. In terms of knowledge, 53-73% of respondents were aware about some fertility preservation options, but had minimal knowledge. Ninety five percent of study participants acknowledged the need for more information on fertility preservation. Majority of clinicians (57%) have never referred to a fertility specialist; and only 38% have referred a patient for fertility preservation. The following factors were cited as barriers to discussion of fertility preservation: lack of knowledge of clinicians, poor success rates of fertility preservation, poor prognosis of patients, and prohibitive costs of treatment. There is an acute need to increase knowledge and awareness about fertility preservation methods and international fertility preservation guidelines among Filipino health practitioners treating cancer patients.

Keywords: *Fertility preservation, Oncofertility, Comprehensive cancer care, Medicine*

Knowledge, attitudes, and practices of health care providers in intimate partner violence screening in a private tertiary hospital

Quinio, Irene B. , Cortes, Auran Rosanne B.

Intimate partner violence (IPV) is a public health problem and human rights concern that has an enormous impact on physical, mental, reproductive and socioeconomic aspects of health. Several health professional organizations recommend screening for violence though current screening rates tend to be low because healthcare providers are generally hesitant to be involved in dealing with women who are victims of violence. This study therefore attempted to assess the knowledge, attitudes, and practices of obstetricians and gynecologists on screening for intimate partner violence in a private tertiary hospital. The Physician Readiness to Manage Intimate Partner Violence Survey (PREMIS) tool was utilized among 123 obstetricians and gynecologists in a private tertiary hospital in Pasig, Metro Manila, with a response rate of 65.8% (81/123). Results showed that the sample participants did not have adequate knowledge on IPV; majority of the sample participants were not fully prepared and equipped to handle patients who are victims of IPV; and the sample participants did not routinely screen for IPV. In the Philippines, the obstetricians and gynecologists generally act as the primary care physicians to the general female population. This provides them a good opportunity to be involved in the secondary prevention of IPV. Recognition of barriers to screening for IPV, development of strategies for increasing awareness to IPV, and

education and training of physicians and allied health care professionals may improve the screening practices for IPV. These in turn will help them to provide appropriate, effective, and holistic care to their patients who are victims of violence.

Keywords: *Intimate partner violence, Domestic violence, Physicians, Tertiary care centers, Philippines, Medicine*

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0493

Laparoscopic versus laparoscopically-assisted myomectomy: An institutional experience *Tan, Delfin A. , Arcilla, Maria Reichenber C., Caras-Torres, Grace B.*

Uterine fibroids are the most common benign tumors in women. Management of symptomatic fibroids may ultimately require surgery and for those desirous of fertility, laparoscopically assisted myomectomy and the conventional laparoscopic procedure are conservative treatment options, with the former providing a less technically demanding approach. This study aims to evaluate the clinical outcomes for laparoscopically assisted myomectomy (LAM) versus laparoscopic myomectomy (LM) done at a tertiary hospital. This is a retrospective chart review of 118 patients with symptomatic myomas who underwent LM (n=66) or LAM (n=52) at a tertiary hospital from January 2010 to December 2017. There were significantly more fibroids removed in the LAM group compared to the LM group, but with no significant difference in the average diameter of fibroid removed. Complex plastic reconstruction with more than 2 layers of repair was done more often in the LAM group ($p<0.001$). The mean operative time was longer and more blood loss was incurred in the LM group, but this was not statistically significant. Almost 14% of patients in the LM group had blood transfusion compared to 4.1% in the LAM group ($p=0.085$). The rate of perioperative complications was similar for both groups. The length of hospital stay was shorter in the LM group, but was not statistically significant. A trend towards higher odds of pregnancy was seen in the LAM group. Majority of patients were delivered via cesarean section with no incidence of uterine rupture. The recurrence of fibroids was seen more in the LAM group (17.9% versus 13.7% for LM), however this was not statistically significant. The surgical, reproductive, and long-term clinical outcomes for both LAM and LM are similar, thus, LAM provides a non-inferior minimally invasive approach and a conservative option for patients desirous of future fertility.

Keywords: *Laparoscopic myomectomy, Laparoscopically assisted myomectomy, Medicine*

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0494

“Hairy potty” ovarian dermoid cyst with fistula to bladder *Rivera, Alma Bella G. , Deterala, Sheryl M.*

Dermoid cysts are usually asymptomatic until complications occur. Spontaneous rupture of a dermoid into an adjacent organ is a rare complication and no such case has been reported in the Philippines. A 24-year-old primipara consulted for pilimiction. Three years earlier, she had recurrent urinary tract infection and was diagnosed to have a dermoid cyst. Left untreated, the cyst grew in size and urinary symptoms worsened. Ultrasound, CT scan and subsequent laparotomy revealed that the dermoid cyst has penetrated the bladder wall resulting to fistula formation between the dermoid and the urinary bladder. Hair and sebum were seen inside the bladder. A left salpingo-oophorectomy and partial cystectomy of the urinary bladder were done. The first locally

documented case of an ovarian dermoid cyst with fistula to the bladder is presented. A review of literature is made, the predisposing factors, possible cause, diagnosis and management are discussed.

Keywords: *Dermoid cyst, Primipara, Pilimiction, Fistula, Salpingo-oophorectomy, Cystectomy, Medicine*

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0495

Left ventricular non-compaction in an adult with patent ductus arteriosus

Yap, Emily Mae L., Gacrama, Edward Nino J. , Medrano, Ana Beatriz

Left ventricular non-compaction (LVNC) is a rare form of cardiomyopathy that may occur in isolation or with an associated cardiac anomaly. It presents with a wide array of manifestations, prompting early recognition to be imperative to prevent progression of symptoms. We report a case of a 46-year-old male complaining of palpitations for 10 years who survived sudden cardiac arrest on the same year as symptom onset. Consult was advised but was not done until he had heart failure symptoms. Carvedilol, furosemide and digoxin were given. Initially, some improvement was noted but he later developed dyspnea on exertion prompting consult at our institution. Pertinent physical examination findings include a dynamic precordium, apex beat at sixth left intercostal space-anterior axillary line (LICS AAL), right ventricular heave, distinct heart sounds, normal rate, irregularly irregular rhythm, a grade 4/6 continuous murmur heard best at the left upper sternal border, suggestive of patent ductus arteriosus (PDA), and a grade 3/6 holosystolic murmur at the apex radiating to the axilla, suggestive of mitral regurgitation. Transthoracic echocardiography confirmed presence of a PDA (0.8cm) with left to right shunt and Qp/Qs of 2.7:1. Incidental finding of LVNC was noted characterized by prominent ventricular trabeculations and deep intertrabecular recesses. Optimal medical treatment for heart failure was given with symptomatic relief. Surgical closure of the PDA was contemplated after hemodynamic studies can confirm the absence of irreversible pulmonary hypertension. Patients with LVNC may be asymptomatic or may present with heart failure, sudden cardiac death or arrhythmias. The diagnosis of LVNC poses a diagnostic challenge. Echocardiography is a cost-effective diagnostic tool that will allow early diagnosis. Cardiac magnetic resonance (CMR) imaging is an alternative diagnostic modality. Once the diagnosis has been confirmed, prompt initiation of guideline-directed medical treatment for heart failure may prevent progression of disease. Left ventricular non-compaction may occur in isolation or in association with other congenital heart diseases such as patent ductus arteriosus. Closure of a PDA is indicated in the presence of a significant shunt and with confirmation of acute reversibility in the presence of pulmonary hypertension to prevent the possibility of decompensation in a patient with heart failure.

Keywords: *Left ventricular non-compaction, Patent ductus arteriosus, Cardiomyopathy, Sudden cardiac death, Medicine*

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LncRNA MEG3 inhibits the progression of prostate cancer by facilitating H3K27 trimethylation of EN2 through binding to EZH2

Zhou, Yaojun , Yang, Hongqiong , Xia, Wei , Cui, Li , Xu, Renfang , Lu, Hao , Xue, Dong , Tian, Zinong , Ding, Tao , Cao, Yunjie , Shi, Qianqian , He, Xiaozhou

This study aims to study the effects of intra-nuclear lncRNA MEG3 on the progression of prostate cancer and the underlying mechanisms. Expressions of relative molecules were detected by Quantitative real time PCR (qRT-PCR) and western blot. Chromatin immunoprecipitation and RNA immunoprecipitation (RIP) assays were used to evaluate the interaction between intra-nuclear MEG3, histone methyltransferase EZH2 and Engrailed-2 (EN2). The impacts of MEG3 on the viability, proliferation and invasion of prostate cancer cells (PC3) were evaluated by methyl thiazolyl tetrazolium, colony formation and transwell assays, respectively. PC3 cells were transfected with MEG3 and transplanted into nude mice to analyse the effect of MEG3 on tumourigenesis of PC3 cells in vivo. EN2 expression was inversely proportional to MEG3 in the prostate cancer tissues and PC3 cells. RIP results showed that intra-nuclear MEG3 could bind to EZH2. Knockdown of MEG3 and/or EZH2 up-regulated EN2 expression and reduced the recruitment of EZH2 and H3K27me3 to EN2, while over-expressed MEG3 caused opposite effects. MEG3 over-expression suppressed cell viability, colony formation, cell invasion and migration of PC3 cells in vitro and inhibited tumourigenesis of PC3 cells in vivo, while EN2 over-expression diminished the effects. These findings indicated that MEG3 facilitated H3K27 trimethylation of EN2 via binding to EZH2, thus suppressed the development of prostate cancer.

Keywords: *Quantitative real time PCR (qRT-PCR), LncRNA MEG3, Chromatin immunoprecipitation, RNA immunoprecipitation, Medicine*

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Loud and clear: a case report on Ortner's syndrome (cardiovocal syndrome)

Liberato, Raymund Darius C. , Gacal, Genesis Raymond B.

Ortner's syndrome encompasses any intra-thoracic process resulting to stretching of the recurrent laryngeal nerve. The stress to this nerve weakens the intrinsic muscles of the larynx and manifests as vocal hoarseness. A 46-year-old female was admitted due to progressive hoarseness. She tolerated this for six months until the onset of other symptoms like orthopnea, bipedal edema, and chest pain. She consulted various doctors and was initially diagnosed with chronic laryngitis from gastroesophageal reflux disease. She was given omeprazole and spironolactone that afforded little help. On examination, the precordium was dynamic with heaves and thrills, PMI was displaced, and systolic murmurs were heard. The ECG revealed left ventricular hypertrophy with left atrial abnormalities. Chest radiograph showed left-sided cardiomegaly. A 2D-echocardiogram divulged severe mitral regurgitation, anterior mitral valve leaflet thickening, and dilated left atrium. Therefore, the impression was Ortner's syndrome, rheumatic heart disease. The patient underwent mitral valve replacement. She was given warfarin, bisoprolol, losartan, spironolactone, and vitamin B complex. At subsequent visits, she reported improvement in her voice. Penicillin injections were also given as secondary prophylaxis. A repeat 2D-echocardiogram displayed a decrease in size of the left atrium. This case has emphasized three important points: First, a comprehensive history and physical examination is vital to reach the correct diagnosis. Second, once the common causes of hoarseness have been excluded yet symptoms persist, it is therefore prudent to look beyond the larynx. And third, the vocal cord paralysis experienced by the patient is just the tip of the iceberg. Her heart is the one dying to be heard.

Keywords: *Ortner's syndrome, Cardiovocal syndrome, Recurrent laryngeal nerve paralysis, Vocal cord paralysis, Hoarseness, Heart failure, Medicine*

Lupus among Filipinos: unmet needs

Esquibel, Ma. Imee Lynne C. , Navarra, Sandra V., Tanangunan, Robelle Mae D.V.

Systemic lupus erythematosus (SLE) is a chronic autoimmune disease with a wide range of manifestations and potential to affect several organ systems. Complications arise from the disease itself as well as the medications especially glucocorticoids, significantly contributing to overall morbidity and mortality. SLE predominantly affects patients during prime productive years resulting in a substantial economic burden on the patient, caregivers, and society due to direct, indirect and intangible costs. The University of Santo Tomas (UST) lupus database established in 2008 and supported by Lupus Inspired Advocacy (LUISA), aims to bring recognition of SLE as an important disease among Filipinos, serving as the impetus to drive policy makers to include SLE in the national health agenda.

Keywords: *Lupus, Filipinos, Unmet needs, Medicine*

Malignant mixed Mullerian tumor: a case series

Lee, Carla Lenice, Dy Echo, Ana Victoria V.

Uterine carcinosarcoma, also known as malignant mixed mullerian tumor (MMMT) is a rare and aggressive malignancy. It is the only type of uterine carcinoma with both an epithelial-derived carcinoma and a mesodermal-derived sarcoma. Classically, they have been considered as a soft tissue sarcoma, however, recent studies ascertain the pathogenesis of carcinosarcomas as to that of a metaplastic transformation of a carcinoma to give rise to a sarcomatous component. With the paradigm shift on the pathogenesis of disease, treatments have been aligned to follow protocols used in aggressive uterine carcinomas and are in further evaluation for its applicability to the aforementioned carcinosarcoma. This paper presents three cases of MMMT diagnosed in a Private Tertiary Hospital from October 2015 to February 2017. Among the three cases, two cases underwent endometrial sampling with results suggestive of MMMT and one case with an intraoperative frozen section done revealing carcinosarcoma. All cases underwent extrafascial hysterectomy with bilateral salpingo-oophorectomy (EHBSO) and bilateral lymph node dissection (BLND). Post-operatively, two of the cases underwent adjuvant chemotherapy and are currently alive. The one case that did not receive adjuvant chemotherapy succumbed to the disease eight months after diagnosis. With the high propensity of MMMT to metastasis, relapse and recurrence, it is then imperative that all cases are properly managed.

Keywords: *Uterine carcinosarcoma, Malignant mixed mullerian tumor, Medicine*

Management of pregnancy in a woman with spina bifida: a case report

Espallardo, Myza C., Sison, Judith M.

With advancements in corrective surgery for spina bifida since the 1960s, affected women are now reaching adulthood and achieving pregnancies. However, the implications on reproductive health—especially in pregnancy—are rarely studied. We are presenting a case of a woman born with spina bifida who has undergone surgical repair and closure of the defect at 4 years old, as well as surgical management for tethered cord at 13 years old. She lived productively into adulthood, became pregnant and delivered vaginally to a healthy baby despite various obstetrical challenges. In the care for this patient, we faced recurrent urinary tract infections, the risk of preterm delivery and the task of coordinated multidisciplinary care to solve dilemmas in decision making. Through this case report, we were able to share our experience, explore the most recent evidence to support our clinical decisions and hopefully serve as a basis for future clinical practice recommendations.

Keywords: *Spina bifida, Pregnancy, Tethered cord, Medicine*

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NP

A meta-analysis on the efficacy of carboprost versus methylergometrine maleate in the active management of third stage of labor for the prevention of postpartum haemorrhage

Pangilinan, Nelinda Catherine B., Vivar, Joann C.

To determine the efficacy of Carboprost versus methylergometrine maleate in the active management of third stage of labor for the prevention of postpartum hemorrhage. Entries in electronic databases with references cited in original studies and review articles were used to identify randomized clinical trials of carboprost versus methergin in the active management of third stage of labor. The quality of published clinical trials were evaluated and assessed based on the efficacy of Carboprost versus methylergometrine maleate for the prevention of postpartum hemorrhage. Six (6) clinical trials were analyzed comprising a total sample pool of 525 women randomized to carboprost group and another 525 women to methergin. The risk ratio for dichotomous outcomes were calculated using a random-effects model while continuous outcomes were pooled using the standard mean difference. But carboprost was found to be more efficacious in reducing the duration and decreasing the amount of blood loss in the third stage of labor and there was less need for an additional drug dose. Risks of side effects were higher in carboprost. Vomiting is the most frequent adverse event followed by diarrhea but are usually self-limiting. Carboprost is well known for its therapeutic role in the management of postpartum hemorrhage, well-tolerated and with minimal adverse effects. It is therefore recommended to be used in hypertensive patients where methylergometrine maleate is contraindicated and in cases refractory to other uterotonic agents.

Keywords: *Carboprost 15, Methy prostaglandin F2a, 15 methyl PGF2a, Methergin, Methylergometrine maleate, Metaanalysis, Postpartum hemorrhage, Medicine*

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NP

Metachronous primary cerebral rhabdomyosarcoma after treatment of oral primitive neuroectodermal tumor/ Ewing's sarcoma in a school-aged girl: a case report

Gonong, Danielle Anne

Multiple primary malignancies are defined as two or three malignant neoplasms arising in different organ systems. Several cases of multiple primary malignancies are emerging in recent years due to the advancement in medical therapy and diagnostics. Multiple primary malignancies are not uncommon occurring at 0.7-16% of cancer patients, however, reported cases of multiple primary sarcomas are sparse. Presented in this report is a pediatric patient diagnosed with primary metachronous cerebral rhabdomyosarcoma after being treated for primitive neuroectodermal tumor/Ewing's sarcoma of the oral cavity. Despite limited cases addressing multiple primary sarcomas, this entity must not be overlooked as it is associated with a meager outcome compared to an index case of sarcoma alone.

Keywords: *multiple primary malignancies, multiple primary sarcomas, metachronous malignancies, PNET/ Ewing's sarcoma, rhabdomyosarcoma, immunohistochemistry, fluorescence in situ hybridization, reverse transcription-polymerase chain reaction, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
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Metaplastic carcinoma with mesenchymal differentiation in augmented breast using liquid silicone injection: a case report

Lorenzo, Lara Mae

The relationship between the use of liquid silicone for breast augmentation and carcinogenesis remains undetermined due to limited data reported, especially regarding its risks for acquiring cancer. We documented a case of an 81-year-old woman who presented with bilateral enlarging breast masses with a known history of breast augmentation using liquid silicone. On microscopic examination, the malignancy showed both mesenchymal and epithelial components in a background of stromal changes related to liquid silicone. Based from morphology and immunohistochemistry studies (p63, CK, HMW-CK, and CK5/6, CD34, and BcL-2), this case was signed out as metaplastic carcinoma with mesenchymal differentiation. This rare case of metaplastic carcinoma with mesenchymal differentiation coexisting with liquid silicone, provides evidence supporting the link between cancer development and siliconomas.

Keywords: *Metaplastic breast carcinoma, liquid silicone, breast augmentation, invasive breast carcinoma, Medicine*

Philippine Journal of Pathology, Volume No. 5 Issue No. 2,
2020,
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Metformin-induced photocontact dermatitis in a 67-year-old male: a case report

Dumaguin, Kris Ray A., Remotigue, Carmela A.

Photocontact dermatitis is a type IV delayed hypersensitivity response to an allergen that is activated by radiation energy. Its incidence is uncertain and only a small number of drugs causing such reaction have been studied. This

is a case of a 67-year-old Filipino male, diabetic, who presented with scaly, erythematous, and hyperpigmented plaques with areas of desquamation and erosions on sun-exposed areas of the skin after taking metformin. Four months prior to consult, the patient was diagnosed with type 2 diabetes mellitus and was started on metformin therapy. Days later, he started noticing scaly, erythematous and hyperpigmented plaques with areas of desquamation and erosions on sun-exposed areas, namely the upper and lower extremities, posterior neck, and forehead. There was notable sparing of areas that are usually covered with clothing such as the torso, inguina and both thighs. There were also no lesions on the scalp, palmar aspect of the hands and plantar surface of the feet. Skin biopsy was considered but was not done per patient's preference. After discontinuation of metformin and avoidance from sun exposure, the skin lesions gradually improved. Metformin is rarely associated with adverse skin reactions. The diagnosis of photocontact dermatitis as a side effect of metformin needs to be considered as a differential diagnosis in patients who present with skin rashes, especially in sun-exposed areas. It is recommended that there should be a high-index of suspicion for adverse drug reactions in such patients. This would reduce medical errors and medical cost and would result to prompt initiation of appropriate treatment.

Keywords: *Metformin, Photocontact dermatitis, Type 2 diabetes, Medicine*

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NP

0505

Methicillin-resistant *Staphylococcus aureus* (MRSA) colonization, risk factors, and antibiotic susceptibility profile among asymptomatic diabetes mellitus type 2 patients

Caoili, Janice C. , Wassmer, Gia D. , Kanapi, Maria Princess L. , Rodriguez-Asuncion, Katrina

Methicillin-resistant *Staphylococcus aureus* (MRSA) related infections are increased in patients with Diabetes Mellitus and are associated with increased morbidity and mortality. This study aims to determine the prevalence, risk factors, and antimicrobial susceptibility patterns of MRSA nasal colonization among individuals with diabetes mellitus. This is a prospective cross-sectional study that included adult Filipino patients with diabetes mellitus type 2. Nasal swab samples were analyzed for the presence of MRSA. MRSA nasal colonization has a prevalence rate of 6.8% which was associated with a history of antibiotic use. The isolates exhibited resistance to Benzylpenicillin/Oxacillin (100%), Clindamycin (42.9%), Vancomycin, and Trimethoprim/Sulfamethoxazole (14.3%). The prevalence of MRSA in this population is higher compared with other Asian countries. No diabetic-related risk factors were identified to be associated with MRSA nasal colonization. The presence of resistance to most commonly used antibiotics should prompt clinicians appropriately treat infections caused by this organism.

Keywords: *Diabetes Mellitus Type 2, Methicillin-Resistant *Staphylococcus aureus*, Nasal Mucosa, Carrier State, Medicine*

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0506

MicroRNA-191 regulates endometrial cancer cell growth via TET1-mediated epigenetic modulation of APC

Yang, Chiu Jung , Ota-Kurogi, Natsuki , Ikeda, Kazuhiro , Okumura, Toshiyuki , Horie-Inoue, Kuniko , Takeda, Satoru , Inoue, Satoshi

Endometrial cancer (EC) is a common gynecological malignancy with relatively favourable prognosis, although alternative diagnostic and therapeutic options remain to be explored for advanced disease. Recent studies enabled

to apply microRNAs (miRs) to clinical cancer management as promising diagnostic and therapeutic biomarkers. We here aimed to identify proliferation-associated miRNAs and characterize their functions in EC cells. Our small RNA-sequencing analysis showed that miR-191 is abundantly expressed in HEC-1A and Ishikawa EC cells along with the high expression of miR-182, which was previously characterized as an EC proliferation-related miRNA in EC. We showed that miR-191 was upregulated in EC tissues than in adjacent normal tissues and its knockdown repressed EC cell proliferation. In silico miRNA target screening identified that ten–eleven translocation 1 (TET1) is one of the putative miR-191 targets. TET1 expression could be downregulated by miR-191 through the mRNA–miRNA interaction in the 3'-untranslated region of TET1. In line with TET1 functions as a methylcytosine dioxygenase, which removes genome-wide DNA methylation marks, decreased TET1 expression resulted in hypermethylation in the promotor region of tumour suppressor adenomatous polyposis coli. Taken together, miR-191 could function as an oncogenic miRNA in EC and serve as a prospective diagnostic and therapeutic target for advanced disease.

Keywords: 5-hydroxymethylcytosine, Endometrial cancer, Epigenetic regulation, miRNA-191, Ten-eleven translocation 1, Medicine

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2020 July,
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F(S) QP501 J82 168/1 2020

0507

Mixed germ cell tumor in androgen insensitivity syndrome: a case report

Soriano-Estrella, Agnes L. , Villafuerte, Mary Grace M.

Androgen insensitivity syndrome (AIS) is a disorder of sexual development characterized by a female phenotype with a 46 XY karyotype. Most patients present with primary amenorrhea; however, 1.1 % of patients present with an inguinal mass. Most commonly, seminoma arising from the gonads are found. This report presents the case of a 15 year-old female looking adolescent who initially presented with an abdominopelvic mass. A diagnosis of AIS was made based on the physical examination findings, endocrine profiling, imaging studies and karyotyping. She underwent cystoscopy, exploratory laparotomy, adhesiolysis, tumor debulking, frozen section, bowel run, repair of serosal tear, Jackson-Pratt drain insertion, bilateral percutaneous nephrostomy under combined spinal and epidural anesthesia. Histopathologic examination of the excised mass revealed a mixed germ cell tumor. This paper will discuss the diagnostic approach as well as the management and prognosis of patients with AIS associated with mixed germ cell tumor.

Keywords: Androgen insensitivity syndrome, Gonadoblastoma, Mixed germ cell tumor, Testicular feminization, Medicine

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(Filipiniana Analytics)
NP

0508

Mullerian adenosarcoma with sarcomatous overgrowth in a premenopausal patient

Zamuco-Francisco, Celeste, Sicam, Renee Vina G.

We report a case of a 33-years old, nulligravid, diagnosed with mullerian adenosarcoma with sarcomatous overgrowth (MASO), who presented with vaginal bleeding and recurrent endometrial polyp. MASO is a rare type of uterine sarcomas, it is a variant of adenosarcomas with poor prognosis. The index patient underwent primary surgical management with lymphadenectomy with a final stage of IC. Histologic diagnosis was Mullerian adenosarcoma with sarcomatous overgrowth. A panel of immunostaining for estrogen receptors, progesterone

receptors and CD 10 showed diffused positivity for the hormones with loss of CD 10 which is consistent with MASO. The rarity of MASO has a distinctive histologic features which merits meticulous sectioning as the clinical course and management vary. It has a poor prognosis due to its short and fast course of the disease.

Keywords: *Mullerian adenosarcoma with sarcomatous overgrowth, Uterine sarcoma, Medicine*

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0509

Mullerianosis of the urinary bladder: first case report in the Philippines

Arada, III, Ernesto V. , Dichoso, Marian C. , Cadavedo, Jane Karla Garcia

Mullerianosis is a rare, benign, and morphologically complex, tumor-like lesion that consists of an organoid structure with normal Müllerian tissue. The diagnosis requires the presence of at least two of the three mullerian tissues: endometriosis, endosalpingiosis, and endocervicosis. There are only less than twenty (20) cases reported in literature. At present there is no published case report of mullerianosis here in the Philippines. This is a case report of a 30-year old Filipino woman who presented predominantly with lower urinary tract symptoms of severe dysuria, hematuria, and lumbar pain and was evaluated for a urologic problem secondary to a posterior bladder mass. Subsequent evaluations revealed the diagnosis of mullerianosis. This is where the interest in mullerianosis sets, its potential to mimic a neoplastic lesion of the urinary tract from clinical and diagnostic viewpoints. The clinical importance to diagnose this case correctly is of grave importance for appropriate management.

Keywords: *Mullerianosis, Endometriosis, Endosalpingiosis, Endocervicosis, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 41 Issue No. 2, 26-32
2017 March to April,
(Filipiniana Analytics)
NP

0510

Mutations and other biomarkers in advanced non-small cell lung carcinoma with implications in the Philippine Setting

Tanchuco, Joven Q.

Lung cancer remains a top cause of new cases and deaths from malignancies globally and locally. The development of targeted therapy for advanced non-small cell lung cancer (NSCLC), particularly adenocarcinoma, promises to improve survival significantly among suitable patients as compared to chemotherapy. About 50% of NSCLC patients have some driver mutations that can be treated by targeted therapy. The most common mutation is that involving EGFR which is found in as much as 90% of patients with driver mutations, most especially in those with adenocarcinoma, in women and never-smokers and those of East Asian ancestry. This is followed by patients with ALK or ROS1 rearrangements in another 5% each. Proper molecular profiling is, however necessary at the outset to identify patients who are suitable for targeted treatment. Fortunately, in the Philippines, testing for EGFR, ALK and ROS1 mutations are possible with several of the tyrosine kinase inhibitor drugs (TKIs) that target these mutations also available. A smaller proportion of patients have BRAF mutations (<5%) but the drug needed to treat this is not available commercially in our country. There are other mutations in advanced NSCLC which are considered potential drug targets for treatment. However, developing a clinically acceptable drug for use in lung cancer has been less successful. KRAS mutations, for example, can be as common as EGFR mutations (and sometimes more so) but no suitable drug for lung cancer has been identified yet. This is also true for METex14, HER2, VEGF, and others that are less common. Clinical studies continue to be done involving these target molecules. These biomarkers have sometimes found usefulness as indicators of poor prognosis and/or

likelihood of developing drug resistance but for the most part, have remained in the realm of research. Immunotherapy was not included as a topic in this article. The search continues for new molecules to be used in targeted therapy for lung cancer. Development of drug resistance to TKIs, often inevitable and just a matter of time, continue to drive these development efforts. The remaining approximately 50% of NSCLC with no driver mutations also push efforts to search for appropriate drugs that will be good for them – including immunotherapy. Studies are also being done to look at various combinations of targeted therapy with chemotherapy and even immunotherapy. It will not be an overstatement to say that the future of lung cancer, especially NSCLC is rapidly evolving and will be creating data that may be very different from what we know at present. Clinicians who encounter and/or treat lung cancer should keep abreast of this rapidly changing information in properly advise their patients on suitable therapies. This is particularly true in financially constrained settings such as the Philippines where even just the cost of testing for these mutations can already be a significant barrier to whether or not to use targeted therapy.

Keywords: *Non-small cell lung cancer, Targeted therapy, Mutations, Medicine*

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0511

Mycotic aneurysm in pregnancy: a case report *Potian, Genevieve Marie , Nidoy, Ma. Kristine Paula M.*

Reported is a case of a 20-year old G2P1 (1001) Pregnancy Uterine 22 weeks age of gestation (AOG), who suffered three episodes of aneurysmal rupture over a period of almost 8 weeks, the last being fatal occurring on the 27th week AOG, despite aggressive antimicrobial treatment, insertion of ventriculo-peritoneal shunt and clinically improving neurologic status. The patient succumbed to subarachnoid hemorrhage resulting from the third aneurysmal rupture. Mycotic aneurysm is a serious and catastrophic clinical condition, more so in a pregnant patient wherein management options are limited in order to preserve pregnancy. This report will discuss the first documented case in the Philippines of mycotic aneurysm in pregnancy secondary to a valvular heart disease, to increase awareness on such cases for timely diagnosis and management.

Keywords: *Endocarditis, Mycotic Aneurysm, Pregnancy, Medicine*

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0512

National health and nutrition education survey on chronic venous insufficiency *Abola, Maria Teresa , Salvador, David Raymund , Maravilla, Lilibeth*

Chronic venous disease is an under-recognized condition which may result in significant morbidities with considerable costs. There is scarce data on chronic venous disease in the Philippines. The National Nutrition and Health Survey II was conducted to determine the national prevalence of different risk factors and clinical conditions. The primary objective of this study is to determine the prevalence of chronic venous disease in adults aged 20 years and older using the Southern Tagalog Venous Insufficiency Questionnaire (STVIQ). A total of 7,212 subjects, were randomly surveyed. Chronic venous disease has a crude overall prevalence rate of 52.5%, is frequently seen in females (60%) and with increasing age. About 38.6% of the population have typical venous symptoms but only 1.6% have edema, stasis pigmentation and healed venous ulcers. Prevalence of chronic venous

disease is not related to urban residence and type of occupation. Chronic venous disease in the Philippines is common, reported in approximately five out of 10 Filipinos, most of whom are asymptomatic.

Keywords: *Chronic venous disease, Chronic venous insufficiency, Varicose veins, Prevalence, Asian, Philippine, Medicine*

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0513

National reference laboratory surge capacity response to a massive nationwide measles outbreak in 2013-2014

Tandoc, Armando III

This management case documents the experience of the Research Institute for Tropical Medicine (RITM) National Reference Laboratory, when a massive nationwide outbreak of Measles occurred during the last quarter of 2013 to the whole of 2014. This was the largest infectious disease outbreak referred thus far to the Institute, with an unprecedented 40,000 blood specimens from all over the country received by the laboratory, overwhelming its testing capacity, and causing large backlogs. The incident revealed significant gaps in the laboratory's preparedness to respond to a sudden large surge of specimens. The activation of a department-level Incident Command System was the most appropriate management approach to implement due to the urgency and scale of the surge of specimens. The response to the specimen surge was prioritized leading to temporary rearrangements in the organizational structure of the department in order to effectively and rapidly coordinate the staff and allocate resources.

Keywords: *measles, outbreak, surge capacity, outbreak response, incident command system, laboratory management, Medicine*

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0514

Neurology Case Series of Five Filipino Patients with Systemic Lupus Erythematosus

Veñegas, Elaine T., Navarra, Sandra V.

Neuropsychiatric systemic lupus erythematosus (NPSLE) and central nervous system (CNS) infection are two significant complications of SLE where mortality is high. Differentiating the two diseases could help deliver appropriate and timely therapeutic strategies that impact mortality in patients with SLE particularly in cases where confusions due to overlapping symptoms delay early interventions. We reviewed the medical records of SLE patients diagnosed and confined for a NPSLE at the University of Santo Tomas Hospital in Manila, Philippines, January 2015-December 2016. We report 5 cases of SLE patients (1 male; 4 females) who presented between January 2015-December 2016 in a tertiary care hospital obtained from the SLE database of University of Santo Tomas (UST) Hospital Section of Rheumatology. All five patients were identified to have NPSLE with following chief complaints: (case 1: 22M) seven-day history of left-sided hemiparesis, (case 2: 22F) vomiting and generalized tonic-clonic seizures, (case 3: 32F) generalized tonic-clonic seizure; (case 4: 67F)) confusion and disorientation, (case 5: 27F) progressive headache, tinnitus, nausea and blurring of vision. All patients had low complement 3 (C3) levels and were treated with steroids, and sent home improved. The challenge of discriminating the varied clinical manifestations to the possibility of underlying CNS infections were heightened by the financial limitations of necessary diagnostics needed to identify the underlying causes. Good clinical skills and appropriate diagnostics and laboratories played an important role in the five cases presented creating a clearer

clinical picture and in ruling out secondary causes thus directly channeling the management in these cases.
(Author's abstract)

Keywords: *Neuropsychiatric, Filipino, SLE, Case series, Medicine*

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0515

Obstetrical and neonatal outcomes of singleton gestations among elderly Filipino primigravids in a tertiary government hospital: A five-year review

Comia, Jr., Leovigildo L. , Acda, Mary Menuro F.

The elderly primigravid has inherent pregnancy risks which may have deleterious effects on both maternal and fetal outcomes. The purpose of this study is to review the obstetric and neonatal outcomes of singleton gestations among Filipino elderly primigravids who delivered in a tertiary government hospital from January 1, 2012 to December 31, 2016. This is a retrospective cohort study of including 80 primigravid women aged 35 years and older (study group) and 160 primigravid women aged 20 to 34 years old (control group). Data was collected through review of hospital records, and data processing and analysis were carried out using the software, Stata 13. A total of 24,751 deliveries were attended to for the five-year period covered, giving the elderly primigravids a prevalence of 6.91%, with a mean age of 38 ± 2.63 years (range 35-43). Significantly, more women in the elderly group delivered at less than 36 weeks age of gestation, delivered abdominally, and had a history of infertility and important co-morbid conditions. No significant difference in the neonatal outcomes were noted between the two groups. It can be suggested that there was no noted difference in terms of the maternal and neonatal outcomes between elderly primigravids than otherwise. Nevertheless, inherent differences between the study groups may be clinically important in customizing the management of these women.

Keywords: *Elderly primigravid, Advanced maternal age, Pregnancy outcomes, Medicine*

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0516

Oral progesterone for maintenance tocolysis after arrested preterm labor: a meta-analysis

Quinio, Irene B. , Palma, Rose Ann S.

The consequences of preterm birth not only for the baby but also for the mother has been well documented over the years. Numerous interventions have been tried and tested and yet it is still a significant problem to date. Progesterone has been documented to be an effective prophylactic drug against preterm labor for those considered at high risk for developing the condition. However, little is known about its effectiveness when given in oral form as a maintenance tocolysis for those who already suffered from an acute episode or preterm labor. To evaluate the effectiveness of oral progesterone in the prevention of preterm birth after being diagnosed of preterm labor using meta-analysis. The study population consisted of women with singleton gestation who were diagnosed with preterm labor, defined as having contractions associated with corresponding cervical dilatation, which were treated with oral progesterone as a maintenance tocolytic until delivery. Journals were searched in different journal databases. Reviewers independently assessed the eligibility of the articles included in this study. Methodologic quality was reviewed using the Cochrane handbook for systematic reviews of interventions. Version 5.1.0 (updated March 2011). Data extracted were analysed using the Review Manager 5.3 Software (Revman 2014)

and the Comprehensive Meta-Analysis Software (CMA3 2016). No statistical difference was noted in terms of latency prolongation, gestational age at birth, occurrence of preterm birth, and on neonatal outcomes such as APGAR Score < 7 at birth, neonatal sepsis, respiratory distress syndrome, and neonatal death between those who received progesterone and those who did not. However, babies in the progesterone group had a mean birthweight higher than their placebo counterparts. The use of oral progesterone as a maintenance tocolysis after arrested preterm labor showed no statistically significant benefit except for higher birthweight in babies upon delivery.

Keywords: *Progesterone, Preterm labor, Preterm birth, Tocolysis, Oral, Medicine*

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0517

Oral versus intravenous antibiotic treatment for osteomyelitis in adults: a systematic review and meta-analysis

Arcegono, Marlon S. , Larrazabal, Jr., Ramon B., Chiu, Harold Henrison C. , Abad, Cybele Lara R.

The worldwide incidence of osteomyelitis is approximately 21.8 cases per 100,000 person-years. The cornerstone of treatment is prolonged (4-6 weeks) intravenous antibiotic administration. This entails additional cost, inconvenience, and added manpower from the healthcare system. Thus, studies have explored the possible use of oral antibiotics as alternatives to improve patient compliance and reduce costs. Our meta-analysis aimed to compare the efficacy of oral versus intravenous antibiotics in treating adult patients with osteomyelitis. Electronic databases (PubMed, Medline, EMBASE, Cochrane Central Register of Controlled Trials, Google Scholar, and Research Gate) from 1966 to April 2020 were searched using the terms “oral antibiotics”, “osteomyelitis”, “randomized controlled trial”. Only studies that directly compared oral versus intravenous antibiotics and confirmed osteomyelitis through biopsy and/or imaging were included. Primary outcome is remission (resolution of symptoms with no relapse and bacteriologic eradication); secondary outcomes, (a) relapse (persistence of the pathogen after treatment) and (b) adverse events. The validity of included studies was assessed using the Cochrane Handbook for Systematic Reviews of Interventions. We performed a random-effects model in Review Manager Version 5.3 with 95% confidence interval. The I² test was used to assess heterogeneity. Seven of 89 trials comprised of 1,282 patients were included in the final analysis. All studies included patients with osteomyelitis of the lower extremities. Oral antibiotics used were Ciprofloxacin, Ofloxacin, and Co-trimoxazole; intravenous antibiotics used were deemed appropriate by the infectious disease specialist. Patients were only given either oral or intravenous antibiotics. Results showed an 8% increase in remission rates [RR 1.08 (0.81 to 1.44, 95% CI, Z = 0.52, p=0.60)] with no heterogeneity (I² = 0%) in the intravenous antibiotics group. However, this was not statistically significant. Furthermore, there was a 62% decrease in relapse rates in the intravenous antibiotics group [RR 1.62 (0.85 to 3.07, 95% CI, Z = 1.47, p = 0.14)] with no heterogeneity (I² = 0%) but was not statistically significant. Oral are comparable to intravenous antibiotics in treating osteomyelitis in terms of remission and relapse rates. However, larger and double-blinded trials should be done to generate more robust data to validate these claims.

Keywords: *Oral , Intravenous, Parenteral, Osteomyelitis, Randomized Control Trials, Medicine*

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Outcome of diabetic and non-diabetic patients who underwent coronary artery bypass graft surgery (CABG) at Chinese General Hospital and Medical Center from January 2010 to December 2016

Fusin-Herrera, Lenor P., Lim-Alba, Rebecca

Several studies have shown that diabetes mellitus increases the risk of having adverse events after CABG. This study was conducted to compare outcome of diabetic and non-diabetic patients after CABG and to test if diabetes mellitus is the strongest predictor of adverse outcomes. This is a retrospective cohort study using charts review of CABG patients from January 2010 to December 2016. Odds ratio were computed to evaluate which risk factors have the strongest association with the occurrence of complications and mortality after CABG. Our study population consists 107 non-diabetic (48%) and 114 diabetic (52%) patients. Diabetic patients have higher post-operative complications at 47% (54) than non-diabetics with 30.8% (33/107) (p-0.012). The most significant risk factor for complication occurrence was hypertension (p-0.015) (OR: 4.123). Every year added above 37 years old has a corresponding six percent increase in the odds of developing morbidity for both groups (p-0.001, OR: 1.06). Advanced age (p-0.000) (OR: 1.07), male gender (p-0.030) (OR: 3.10) and diabetes (p-0.043) (OR: 0.043) increase the risk of arrhythmia. The odds of developing pneumonia is higher among males (p-0.005) (OR:0.18) and smokers (p-0.041)(OR: 3.50) in both groups. The odds of developing acute kidney injury was increased by 12% for every year added above 37 years old (p-0.035)(OR: 1.12). There is a two percent increase risk for developing acute kidney injury for mean post operative blood glucose above 110mg/dL (p-0.030) (OR: 1,025). Hypertension and age are significant predictors of morbidity in this study. Age related changes in cardiac physiology can be contributory. Male smokers have a higher risk of developing pneumonia in both groups pointing the significance of this risk factor. Elevated post-operative blood glucose must be addressed fully because of its association with acute kidney injury. More complications are encountered among diabetic patients. However, diabetes mellitus is not the strongest predictor of mortality. Instead, age and hypertension showed higher association with adverse outcome.

Keywords: *Coronary artery bypass graft surgery, Diabetes mellitus, Medicine*

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Outcomes of hospitalizations among patients with systemic lupus erythematosus in a tertiary government hospital in the Philippines

Quilisadio, John Elmer C., Salido, Evelyn O.

There is no documentation of the causes of hospitalization among lupus patients in the Philippines in recent times and this study hopes to fill in this knowledge gap. Thus, this study reports the outcomes of hospitalizations among patients with systemic lupus erythematosus (SLE) admitted at the charity wards of the University of the Philippines-Philippine General Hospital (UP-PGH). A retrospective chart review was done on all admitted patients with SLE from January 2015 to December 2015 admitted at UP-PGH, the national referral center and tertiary training government hospital in Manila, Philippines. There were a total of 81 SLE patients meeting the inclusion criteria. SLE admission comprised 3.1% (138/4408) of admitted charity cases in our department. The most common reasons for hospitalizations are infection (64.1%), lupus activity (60.3%), and lupus activity with infection (47.4%). The mean duration of hospitalization was 12.4 (SD 8) days. Patients with organ damage from lupus were mostly able to fully recover (20%) while those admitted due to more than one reason mostly had partial recovery (95.2%). Infection is the top leading cause of death (6%). Serositis [OR 0.11, 95% confidence interval (CI) 0.02- 0.63] and number of ACR SLE criteria fulfilled on diagnosis (OR 0.47, 95% CI 0.22- 0.997) were likely to have poor outcome of hospitalization. The over-all cohort's survival on admission was 100.0%, 98.8%, 97.4%, and 92.5% for one, two, six, and more than 15 days of admission, respectively. Our cohort confirms the results of previous studies suggesting that infection and disease activity were the top reasons for hospitalization

among lupus patients whether living from emerging and developed nations. Indeed, the morbidity and mortality of our patients remains a great challenge not just among physicians but with the government and various stakeholders.

Keywords: *Systemic lupus erythematosus, Outcomes, Hospitalization, Filipino, Medicine*

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0520

Ovarian new growth creating a cutaneous fistula: a case report

Limson, Margaret Joyce C. , de Guzman, Glaiza S.

Ovarian new growths are among the most common tumors in women. Their presentation at time of diagnosis vary and are often incidental findings on ultrasound examination. Complications of ovarian masses include torsion, rupture, infection, hemorrhage, and malignant degeneration. These masses have also been known to create fistulous tracts to other organs of the body. Entero-adnexal communications have been reported in literature. However, fistula formation to the skin has not yet been reported. Here, we present an adult woman diagnosed to have ovarian new growth and a one-year history of serous discharge from a skin lesion. Imaging studies show a fistulous connection to the abdominopelvic mass. She underwent excision of the mass with fistulectomy. This is the first reported case of an ovarian new growth which created a cutaneous fistula.

Keywords: *Cutaneous, Fistula, Ovarian new growth, Teratoma, Medicine*

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0521

Overexpressing microRNA-34a overcomes ABCG2-mediated drug resistance to 5-FU in side population cells from colon cancer via suppressing DLL1

Xie, Zheng-Yuan , Wang, Fen-Fen , Xiao, Zhi-Hua , Liu, Si-Fu , Tang, Sheng-Lan , Lai, Yue-Liang

Colon cancer side population (SP) cells are a small subset of cancer cells that have cancer stemness capacity and enhanced drug resistance. ABCG2 is a multidrug resistance-related protein in SP cells and has been demonstrated to be regulated by Notch signalling pathway. Recently, microRNAs are reported to play a critical role in SP cell fate. However, their role in ABCG2-mediated drug resistance in colon cancer SP cells remains unclear. In the current study, the different expressions of miR-552, miR-611, miR-34a and miR-5000-3p were compared within SP and non-SP cells, which were separated from human colon cancer cell lines (SW480 and LoVo). We found that miR-34a was significantly down-regulated in SP cells and that overexpressing miR-34a overcame drug resistance to 5-fluorouracil (5-FU). The luciferase reporter assay indicated that miR-34a negatively regulated DLL1, a ligand of Notch signalling pathway, via binding with 3'-untranslated region of its messenger RNA. In addition, overexpressing miR-34a overcame ABCG2-mediated resistance to 5-FU via DLL1/Notch pathway *in vitro*, and suppressed tumour growth under 5-FU treatment *in vivo*. In conclusion, our findings suggest that miR-34a acts as a tumour suppressor via enhancing chemosensitivity to 5-FU in SP cells, which provides a novel therapeutic target in chemotherapy-resistant colon cancer.

Keywords: *Colon cancer, Drug resistance, miR-34a, Notch signalling pathway, Side population cells, Medicine*

Overexpression of RSK4 reverses doxorubicin resistance in human breast cancer cells via PI3K/AKT signalling pathway

Mei, Yan , Liao, Xiaoming , Zhu, Lingyu , Yang, Huawei

Doxorubicin (DOX) is one of the most effective chemotherapy drugs for the treatment of metastatic breast cancer (BC), but drug resistance becomes an obstacle to treatment. This study aims to investigate the role of Ribosomal S6 protein kinase 4 (RSK4) in regulating BC resistance to DOX. We first used Kaplan–Meier Plotter to identify the prognostic roles of RSK4 in BC. DOX-resistant BC cells (MCF-7/DOX) were constructed and the expression of RSK4 was determined by reverse transcript polymerase chain reaction and western blot. Subsequently, we overexpressed the RSK4 in MCF-7/DOX cells, and measured drug resistance, colony formation, cell migration, invasion ability and cell apoptosis after transfection. In addition, western blot was used to explore the expression of apoptosis-related proteins and BC-resistance protein. Effects of RSK4 on activation of the PI3K/AKT signalling pathway were also tested. Furthermore, tumour xenograft in nude mice was constructed to observe the effect of RSK4 overexpression on tumour growth in vivo. In conclusion, RSK4 was positively correlated with survival rate in BC patients, which is lowly expressed in MCF-7/DOX. Meanwhile, the overexpression of RSK4 may inhibit drug resistance, cell migration, invasion, apoptosis and tumour growth. RSK4 may effectively attenuate DOX resistance in BC by inhibiting the PI3K/AKT signalling pathway.

Keywords: *Doxorubicin (DOX), Cell migration, Colony formation, Medicine*

Overview of fertility preservation: History, management, available strategies and future directions in the Philippines

Novero, Virgilio M. Jr.

The increasing number of young survivors after cancer treatment and of patients with non-malignant conditions who are at risk for subfertility has resulted in a demand for fertility preservation services, including the Philippines. The aim of this paper is to provide an overview of the history, indications, and management principles of fertility preservation. Also, the available strategies in the Philippines in both pre-pubertal and post-pubertal men and women and future directions of the field in the country will be discussed. Literature review, historical accounts Fertility preservation should be a priority when treating children and adults of reproductive age with agents that have deleterious effects on the gonads. If harmful treatment will be used, the options of fertility preservation should be discussed, as early as possible by the primary physician in collaboration with the oncologist and the reproductive medicine specialist. Most of the known options for fertility preservation are available in the Philippines and are being implemented in the local IVF centers. Recent developments hint of a potentially faster progress in the field with the establishment of the Philippine Society for Fertility Preservation in collaboration with other professional societies and a linkage with the Department of Health with the signing into law of the National Integrated Cancer Control Act of 2019.

Keywords: *Fertility preservation, Embryo cryopreservation, Gonadotoxicity, Oocyte cryopreservation, Ovarian tissue cryopreservation, Medicine*

Papillary squamous carcinoma of the cervix with metachronous clear cell renal cell carcinoma

Luna, Jericho Thaddeus P. , Medalla, Renee Riza C.

Multiple primary tumors can be classified as synchronous or metachronous. Cases have been reported, with a prevalence, in gynecologic malignancies, of 1.9 to 4.3%, and commonly occurring in endometrial and ovarian malignancies. Renal tumors coexisting with primary cervical cancer are mostly metastatic tumors, and at present, no case of cervical carcinoma metachronous with renal cell carcinoma has been reported on literature. This is a case of Papillary Squamous Cell Carcinoma of the cervix who developed a metachronous Clear Cell Renal Cell Carcinoma. Several months after the diagnosis of cervical cancer, she presented with an abdominal mass and signs of uremia secondary to obstructive uropathy. She underwent radical nephrectomy with contralateral percutaneous nephrostomy. Definitive plan for the cervical mass is concurrent chemotherapy and radiation, depending on the improvement in renal function. Currently, there are no clearly established guidelines in managing metachronous cervical and renal masses, and this presents a unique opportunity to document this case, and study its implications on management and prognosis.

Keywords: *Metachronous, Multiple primary tumors, Medicine*

Pathological consequences of the unfolded protein response and downstream protein disulphide isomerases in pulmonary viral infection and disease

Chamberlain, Nicolas , Anathy, Vikas

Protein folding within the endoplasmic reticulum (ER) exists in a delicate balance; perturbations of this balance can overload the folding capacity of the ER and disruptions of ER homeostasis is implicated in numerous diseases. The unfolded protein response (UPR), a complex adaptive stress response, attempts to restore normal proteostasis, in part, through the up-regulation of various foldases and chaperone proteins including redox-active protein disulphide isomerases (PDIs). There are currently over 20 members of the PDI family each consisting of varying numbers of thioredoxin-like domains which, generally, assist in oxidative folding and disulphide bond rearrangement of peptides. While there is a large amount of redundancy in client proteins of the various PDIs, the size of the family would indicate more nuanced roles for the individual PDIs. However, the role of individual PDIs in disease pathogenesis remains uncertain. The following review briefly discusses recent findings of ER stress, the UPR and the role of individual PDIs in various respiratory disease states.

Keywords: *Disulphide bond, ER stress, PDI, Pulmonary disease, UPR, Medicine*

The Philippine coronavirus disease 2019 (COVID-19) profile study: clinical profile and factors associated with mortality of hospitalized patients

Punongbayan, Rommel B. , Calvario, Ma. Kristine Joy S. , Duya, Jose Eduardo D. , Quiwa, Leslie Q. , Soria, Maria Luz Joanna B., Ting, Frederic Ivan L.

The coronavirus disease 2019 (COVID-19) have spread globally and reached the Philippines in late January 2020. This study is the first local and nationwide research on admitted COVID-19 adult patients: their clinic-demographic profiles, managements, and clinical outcomes. We aim to determine the associated factors with mortality among COVID-19 patients. This was a retrospective, multicenter, observational cohort study of rt-PCR confirmed and admitted COVID-19 adult patients in 89 hospitals in the Philippines from February to July, 2020. The data on admission of patient's demographic, clinical, laboratory, pre-hospital and during hospital treatment management and in-hospital clinical outcomes were gathered. The data were described and analyzed using multiple logistic regression analysis. There were 2884 rt-PCR confirmed and admitted COVID-19 adult patients included in the study. Majority were Filipinos (99.4%), with slightly more males (54.4%) than females. 21% were healthcare workers (HCWs). Mortality was higher among non-HCWs at 16% versus 2% among HCWs. 63% of the patients had a co-morbidity, which included hypertension (69%), diabetes mellitus (48%) and chronic kidney disease (26%). The significantly associated factors with mortality in this Philippine cohort were: age >60 years, hypertension as co-morbidity, tachypnea (> 22/minute), WBC count > 10 x 10⁹/L, and elevated serum lactate dehydrogenase (LDH) (all p<0.05). Elevated serum LDH was the strongest factor associated with mortality (OR of 8.74, p=0.004). This study identified that age, hypertension, tachypnea, elevated WBC count, and elevated serum LDH were associated with mortality among COVID-19 adult patients and results were consistent with results from studies done in other countries. We recommend that early detection and awareness of exposures and symptoms will improve the management and clinical outcomes of COVID-19 adult patients. Also, a long follow-up of the outcomes of COVID-19 to determine the effectiveness of treatment is recommended for further study.

Keywords: *Philippines, COVID-19 adults, Hospitalized, Mortality, Medicine*

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Philippines diagnostic pathology laboratory benchmarking

Badrick, Tony

To ensure continuous quality improvement, laboratories need to obtain data about best practice from peers. Data about analytical EQA is available but far less is available about other important aspects of laboratory performance. There is a Roche Diagnostics Survey of laboratories which provides benchmarking in key areas of laboratory performance. The Roche Diagnostics Survey included 1058 laboratories from 14 countries in the Asia Pacific Region with both developing and developed nations. The data were collected in 2017 but the survey has been collecting data each second year since 2011. Data was collected in the areas of quality, speed and cost. The results for the Philippines was compared with other countries in the Asia Pacific Region. Broadly it was found that 42% of all laboratories in the Region were accredited to ISO 15189 or ISO 9001 and that 50% of laboratories were in an External Quality Assurance (EQA) program. Compared to other countries in the survey, the Philippines laboratories had fewer sites with ISO 15189 and with Lean Six Sigma improvement deployment. There are six laboratories in the Philippines that are accredited to ISO 15189. There was a greater emphasis on customer satisfaction related Key Performance Indicators (KPIs) such as turnaround time monitoring, cost reduction and employee productivity. Benchmarking can highlight the differences in the apparent quality of laboratory services compared to their peers and may lead to improvement. The benchmarking comparison has identified opportunities for Philippine laboratories to improve including obtaining ISO 15189 accreditation, implementing laboratory information systems and concentrating on Lean practices to improve productivity. The Roche scheme provides an ongoing (growing) large sample of benchmarks that can be used by participants to improve their performance and the performance of individual countries.

Keywords: *benchmarking, quality, cost of service, customer satisfaction, turnaround time, Medicine*

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0528

Physician empathy in public and private internal medicine residency training programs in Pasig City

Fernando, Kenneth Brian M. , Lachica, Joseph Anthony , Dela Cruz, Dave Ryan A. , Dofitas, Mary Stephanie M. , Aniceto, Rafael Carlos C. , Lee Yu, Melody Hope L.

Empathy is important because it has been speculated to have a positive effect on patient outcomes; it is a skill that can be learned and developed. This study obtained quantitative measurements of patient-perceived and self-assessed physician empathy. Empathy levels between public and private tertiary hospitals were compared. This study utilized a quantitative cross-sectional design, with surveys as the strategy for data collection. Participants: 162 out-patient department patients aged 19-75, and 69 IM residents were sampled from one private and one public tertiary hospital. Outcome Measures: The Jefferson Scale of Patient Perceptions of Physician Empathy (JSPPE) and the Jefferson Scale of Physician Empathy (JSE) were used to measure the empathy levels. Analysis: Sample size calculation was done using OpenEpi. An alpha level of 0.05 was used for computing the independent samples t-test. Internal Medicine patients from the private hospital rated the physicians with higher empathy scores (mean=31.23) compared to their public hospital counterparts (mean=29.01), which is statistically significant ($p=.0134$). Residents from the private hospital also scored a higher self-assessed empathy score (mean=110.46) compared to physicians from the public hospital (mean=102.13), which is also statistically significant ($p=.0147$). This study provided preliminary information on the empathy levels of physicians in the Philippine setting between private and public hospitals, showing that physician empathy levels are consistently higher in the private hospital facility. The results can help hospitals incorporate or improve training in empathy in internal medicine residency programs, as empathy is known to affect patient health outcomes.

Keywords: *Physician empathy, Residency training, Patient care, Medicine*

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0529

A pilot study on the evaluation of clinical chemistry laboratory test performance using six sigma metrics

Medina, Pier Angeli

Six sigma has been used over the years, initially in manufacturing industries to improve quality by reducing the number of wastes and defects. In the laboratory, it can also provide measurement of quality using the sigma scale. The main objective of the study is to evaluate the performance of tests in two chemistry analyzers using the six sigma scale. A total of twenty (28) tests were evaluated on two Abbott Architect c8000 chemistry analyzers from September 2014 to July 2019 using results of quality control mean, coefficient of variation, bias and total allowable error to compute for the six sigma value. Both level one and level two third party quality controls were included in the evaluation. Results of the study showed the tests that were >6 sigma for both levels 1 and 2 throughout the 5 years. Di-Bil, CK, HLD, TG and UA were consistently >6 sigma for one machine while CK, Di-Bil, HDL, Mg, TG and UA were consistently >6 sigma for the other. Level 1 and Level 2 sigma scores were noted to be incongruent in some analytes as follows: ALB, ALT, K, TP for one instrument and ALB, ALP and AST for the other instrument. Electrolytes Ca, Cl, and Na were generally low. Using six sigma metrics allowed the laboratory to evaluate the performance of the chemistry tests objectively. Tests that are >6.0 sigma signifies world

class performance and entail application of fewer Westgard rules with fewer number of runs while those that are <3.0 need method improvement or more stringent quality control measures. The findings show that we can use this for monitoring and performance evaluation for quality improvement.

Keywords: *bias, laboratory, quality control, quality improvement, six sigma, Westgard rules, Medicine*

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0530

PINK1 import regulation at a crossroad of mitochondrial fate: the molecular mechanisms of PINK1 import *Sekine, Shiori*

PTEN-induced kinase 1 (PINK1) is a mitochondrial kinase whose activity is tightly regulated by the mitochondrial health status. In response to mitochondrial damage, activated PINK1 can promote mitophagy, an autophagic elimination of damaged mitochondria, by cooperating with Parkin ubiquitin ligase. Loss-of-function of PINK1/Parkin-mediated mitophagy results in the accumulation of dysfunctional mitochondria, which could be one aetiology of Parkinson's disease (PD). Within step-by-step signalling cascades of PINK1/Parkin-mediated mitophagy, mitochondrial damage-dependent PINK1 kinase activation is a critical step to trigger the mitophagy signal. Recent investigation of this process reveals that this stress-dependent PINK1 kinase activation is achieved by its regulated import into different mitochondrial compartments. Thus, PINK1 import regulation stands at an important crossroad to determine the mitochondrial fate—'keep' or 'remove'? In this review, we will summarize how the PINK1 import is regulated in a mitochondrial health status-dependent manner and how this process could be pharmacologically modulated to activate the PINK1/Parkin pathway.

Keywords: *Mitochondrial import, Mitochondrial protease, Mitophagy, Parkinsons disease, PINK1, Medicine*

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0531

Pleural effusion as an initial presentation of dermatomyositis: a case report *Liong, Yves Jean Y., Rivera-Go, Ivy Catherine T.*

Dermatomyositis is an autoimmune inflammatory process typically presenting with symmetric proximal muscle weakness preceded by skin lesions. We report a case of dermatomyositis initially presenting with pleural effusion before developing rashes and proximal muscle weakness. A 46-year-old female with no known comorbidities presented with four weeks of anorexia. On work-up, she was found to have bilateral pleural effusion. Diagnostic and therapeutic thoracentesis done draining one liter. Pleural fluid analysis showed exudative character with no presence of bacteria or malignant cells. Intravenous piperacillin-tazobactam 4.5g every eight hours was given for one week but effusion persisted. After 10 days of intravenous antibiotic, antibiotic was shifted to oral cefixime 400mg tab once daily and levofloxacin 500mg tab once daily. However patient developed maculopapular rashes over the face, neck and arms two days after starting the oral antibiotics. The antibiotics were withheld and antihistamine was given for possible drug reaction. No improvement thus oral prednisone 20mg/day for six days was given. After 14 days of oral prednisone, rashes persisted, now with proximal muscle weakness in all extremities associated with the 'V-sign' and 'shawl sign'. The patient was readmitted and work-up showed resolution of pleural effusion. ANA was positive and CKMM level was markedly high. Other rheumatologic tests were unremarkable. Patient was started on Intravenous hydrocortisone 200mg/day and methotrexate 7.5mg/day once a week. Nine days after initiating intravenous glucocorticoid and methotrexate, patient's symptoms resolved.

Patient was advised for malignancy work-up on follow-up but was lost to follow-up. Dermatomyositis initially presents with rashes (100%) and proximal myopathy (95.2%). Interstitial lung disease (ILD) may occur (28.6%), but pleural involvement is rare with only three reported cases and all were associated with ILD. There are no reports of pleural effusion as the initial manifestation. Dermatomyositis is confirmed using the Bohan and Peter Criteria and our patient fulfilled a definitive diagnosis. Glucocorticoids and immunosuppressive drugs are mainstay treatment. Pleural effusion involvement was observed to have good response to treatment, in contrast to ILD which was associated with higher mortality thus should be ruled out in patients with pleural effusion. Autoimmune diseases are known for classic manifestations, but may rarely mimic common clinical manifestations thus high index of suspicion is warranted to provide prompt management.

Keywords: *Dermatomyositis, Pleural effusion, Case report, Autoimmune disease, Medicine*

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0532

POGS 2019 report on obstetrical and gynecological indicators of healthcare
Mangubat, Ma. Luisa T., Magno, Angelito D.L., Irabon, Ina S., del Prado, Jennifer C., Añonuevo, Antoinette U., Amorin, Helen R., Habana, Maria Antonia E., Macayaon, Annette M., Te-Santos, Helen Grace

To address the need to improve the collation of vital statistical data from POGS-accredited institutions, the POGS Committee on Nationwide Statistics developed a new electronic census platform (now called the POGS Nationwide Statistics System or PNSS), that replaced the Integrated Statistical Information System (ISIS) which was started in 2008. The aims of this paper are the following: (1) to present initial data gathered through the PNSS and compare it to the Department of Health (DOH) census; (2) to discuss obstetrical and gynecological indicators of healthcare and (3) to assess the limitations of the PNSS and recommend improvements. This is a cross-sectional study that shall report obstetrical and gynecologic data generated from submissions of POGS-accredited hospitals from January to December 2019, through the PNSS. Charts and tables illustrating frequencies of the different health indices are presented. Health indices include crude livebirth rate, age-specific birth rate, adolescent birth rate, cesarean section rate, stillbirth rate, neonatal mortality rate, perinatal mortality rate, maternal mortality ratio, frequency of gynecologic admissions and procedures, and death secondary to gynecologic diseases. The number of accredited hospitals that submitted their census with 100% compliance was 135, thus 91.8% of accredited hospitals had full compliance. A total of 365,947 cases were reported, 89% (326,026) of cases were obstetric cases and the remaining 11% (39,921) were gynecologic cases. For obstetrical health indicators: the livebirth rate is highest in the NCR 36%, with the highest age-specific birth rates in the 20-29 age groups; adolescent birth rate is 7.3%, overall CS rate is 32.8%, stillbirth rate is 14.3 per 1000 neonates, neonatal mortality rate is 3.65 per 1000 livebirths, perinatal mortality rate is 18.35 per 1000 total births and maternal mortality ratio is 81.72 per 100,000 livebirths. The most frequent indications for gynecologic admissions are leiomyoma uteri, Abnormal Uterine Bleeding-Polyp (AUB-P) and Abnormal Uterine Bleeding-Myoma (AUB-M), while endometrial biopsy/diagnostic curettage is the most frequent gynecologic procedure performed; There were 150 deaths (0.38%) reported among gynecologic cases and majority (96%) had gynecologic malignancies, with ovarian cancer being the highest (41%). Nationwide statistics serve as strong evidence on which policies are created. It provides vital information that serves as a basis for decision-making, planning and implementation of health programs and basic services and can also be used for monitoring and evaluation. It is recommended that preparations be undertaken for an improved 2021 version with enhancing the mechanism of encoding and transmitting data, improving data quality and developing more health indicators. Regular coordination with the accredited hospitals is encouraged for a more accurate data outcome and compliance performance. Collaboration in identifying areas for research should be fostered.

Keywords: *Statistics, Census, Health indicators, Medicine*

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Postpartum hemorrhage secondary to pseudoaneurysm of the uterine artery: a case report

Elio, Thelma Marie Avendano, Lim, Vanessa Marie Ty

Obstetric hemorrhage is the most important cause of maternal mortality worldwide approximately 27.1%. Pseudoaneurysm of the uterine artery is rare but a potentially life-threatening complication reported to occur. In the Philippines, experience with these kinds of vascular abnormalities is limited. This is a case of a 26-year old Gravida 2 Para 1 (1011) eight weeks post-cesarean section with profuse vaginal bleeding. Transvaginal ultrasonography with doppler revealed arterio-venous malformation of the cervix with high arterial pulsations. Pelvic angiography revealed brisk contrast extravasation and pooling at the fundal branch of the left uterine artery consistent with pseudoaneurysm for which she successfully underwent superselective coil embolization. Repeat ultrasonography after one week showed absence of arterial pulsations on the cervical echogenicity. Despite a recent proliferation of reports, uterine artery pseudoaneurysm still remains to be a rare cause of unexplained postpartum hemorrhage, which requires a high index of clinical suspicion for diagnosis.

Keywords: *Cesarean section, Postpartum hemorrhage, Pseudoaneurysm, Uterine artery embolization, Medicine*

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Power doppler versus saline infusion sonography in the diagnosis of endometrial polyps in patients who present with abnormal uterine bleeding

Rivera, Leah N., Dee, Marlyn T.

To compare the diagnostic performance of Power Doppler versus Saline Infusion Sonography (SIS) in the diagnosis of endometrial polyps in patients who present with abnormal uterine bleeding using histopathological confirmation. This is a 2-year cohort study involving non-pregnant patients with abnormal uterine bleeding examined prospectively and subjected to both transvaginal sonography with power Doppler and SIS. Single-vessel pattern/comma-like patterns on power Doppler were considered positive. Results were compared to the gold standard histopathological examination obtained by endometrial biopsy, curettage, or hysteroscopic resection of endometrial polyp. A total of 42 patients completed the study and were included in the final analysis. Thirty-five (35) patients had confirmed endometrial polyp by histopathology. Power Doppler was positive in 32 of these patients. SIS, on the other hand was positive in 16 patients. The results are as follows: sensitivity 89%, specificity 83%, and positive and negative predictive values 97% and 56% respectively for power Doppler. For SIS, on the other hand, sensitivity 46%, specificity 86%, positive and negative predictive values of 94% and 24% respectively. Power Doppler is as useful in identifying patients with endometrial polyps and can be used in place of the traditional test SIS. Its diagnostic accuracy is better than SIS.

Keywords: *Saline Infusion Sonography, Power Doppler, Endometrial Polyp, Medicine*

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Predictive value of white blood cell count and neutrophil-to-lymphocyte count ratio in classifying the severity of community acquired pneumonia in immunocompetent patients

Masbang, Armin N., Rosario, Minette Clare O.

White blood cell (WBC) count, from which neutrophil-to-lymphocyte count ratio (NLCR) can be derived, is commonly requested in the hospital setting among admitting patients with community acquired pneumonia (CAP). This study aims to establish the predictive value of WBC count and NLCR in classifying CAP which guides the clinicians in the choice of antibiotics and site-of-care. The researchers aim to evaluate the predictive value of WBC count and NLCR during consultation and admission in classifying patients with CAP based on the management-oriented risk stratification of the 2016 Philippine Clinical Practice Guidelines on CAP. This was a prospective cross-sectional study conducted in St. Luke's Medical Center, Quezon City. Adult patients diagnosed with CAP were classified according to severity of infection based on the 2016 Philippine Clinical Practice Guidelines on CAP. WBC count of each patient was determined, and their corresponding NLCR was derived. The differences of WBC count and NLCR per risk were evaluated using chi-square and ANOVA test adjusted for the distribution of the outcome. Sensitivity and specificity of WBC and NLCR were determined for the following: (1) between CAP low risk (LR) versus CAP moderate risk (MR) and CAP high risk (HR) and (2) between CAP LR and CAP MR versus CAP HR. Receiver operating characteristic (ROC) curve was constructed to evaluate the sensitivity and specificity of WBC and NLCR in classifying. ROC curves displayed sensitivity versus 1-specificity such that area under the curve (AUC) ROC for WBC and NLCR. Two hundred eighty (280) CAP patients from June 2016 until April 2017 were studied. Among the CAP patients, 69 (24.6%) were classified as LR, 172 (61.5%) were classified as MR, and 39 (13.9%) were classified as HR. The mean WBC count was 11,725.8 ($\pm 5,205.82$)/ul. The mean WBC per risk were as follows: 9,178/ul for LR; 12,251/ul for MR, and 13,916/ul for CAP HR. It showed that the higher the risk, the higher the mean of the WBC count (<0.00001). The mean NLCR was 8.9 (± 8.4). The mean average of NLCR per risk were as follows: 5.4 for LR, 8.6 for MR, and 16.1 for HR. It showed that the higher the risk, the higher the NLCR (<0.00001). In predicting CAP patients with HR and MR from LR, the AUC of NLCR (0.700) was almost the same as that of the WBC count (0.698). In predicting CAP patients with HR from MR and LR, the AUC of NLCR (0.726) was higher than the WBC (0.621), indicating that NLCR is a fair predictive marker in distinguishing HR from MR and LR. As the severity of CAP increases, the mean of the WBC count and NLCR increases. Between the two biomarkers, NLCR predicts CAP severity more than the WBC count. Furthermore, NLCR better predicts HR from MR and LR.

Keywords: *White blood cell count, Neutrophil-to-lymphocyte count ratio, Community acquired pneumonia, Medicine*

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Pregnancy as a ticking bomb: a sonographic review of type II cesarean section scar pregnancy

Zayco-Magno, Marie Therese, Panlilio, Regina Rosa M.

Cesarean section scar pregnancy (CSP) is a pregnancy implanted outside the uterine cavity in the site of a previous cesarean section scar and is considered the rarest form ectopic pregnancy. CSP is a modern phenomenon and has been reported with increasing incidence due to either an increased reporting or increasing cesarean section rate. The true incidence, however, has not been fully determined as some cases will end up in the first trimester and go unreported or undiagnosed. Undiagnosed cesarean scar pregnancy can be fatal due to life threatening hemorrhage as well as uterine rupture due to an abnormally adherent placenta. Accurate diagnosis is important because it enables the clinicians to establish the risk of complications and aid in prompt management. Ultrasonography is often the first step in detecting CSP and MRI should only be used in equivocal cases. The case presented is in a

multiparous woman with ultrasound finding of a cesarean scar pregnancy where expectant management was the initial option but because of the outward progression of the CSP, it was terminated. There is no established universal treatment guidelines for CSP and treatment options include expectant, medical, surgical or combinations of these.

Keywords: *Cesarean scar pregnancy, Type II Cesarean Scar Pregnancy, Exogenic Type cesarean scar pregnancy, Medicine*

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0537

Pregnancy in Herlyn-Werner-Wunderlich syndrome: a case report and review of literature

Gorgonio, Nephtali M. , Sucayan-Sta. Ana, Marizel Ann M.

Herlyn-Werner-Wunderlich Syndrome (HWWS) is a triad of uterus didelphys, unilateral obstructed hemivagina, and ipsilateral renal agenesis. In the review of the locally published literature, there have been seven HWWS cases reported, none of whom were pregnant. A 24-year-old was diagnosed with Herlyn-Werner-Wunderlich Syndrome during caesarean section of a term pregnancy, occupying the right hemiuterus with obstructed hemivagina. Ultrasound showed uterus didelphys with communicating endometrial cavities. MRI revealed uterus didelphys, two cervixes and an obstructed right hemivagina. The patient refused excision of vaginal septum. Two years later, she delivered spontaneously to a live fetus, occupying the hemiuterus with the unobstructed hemivagina. In pregnant women with HHWS, who did not undergo prior surgical intervention, the mode of delivery depends on the side of pregnancy. If it is located on the obstructed hemivagina, caesarean section is inevitable. If it is on the unobstructed side, there is hope for vaginal delivery.

Keywords: *Mullerian duct anomaly, Uterine didelphys, Obstructed hemivagina, Renal agenesis, Herlyn-Werner-Wunderlich Syndrome, Medicine*

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0538

Prenatal diagnosis of fetal lower urinary tract obstruction presenting as an abdominal mass in a twin pregnancy using three-dimensional ultrasound with “fly thru” technology: a case report

Decena, Ditas Cristina D. , Rivera, Leah Socorro N. , Casuela-Dimaano, Nina Joy

We report a case of a twin pregnancy, wherein one twin presented with an abdominal cyst since 12 weeks' gestational age. Upon referral at 21 weeks' gestational age, three-dimensional ultrasound with Fly thru technology was used to aid in the identification of the etiology and nature of the mass. Once megacystis was confirmed, serial vesicocentesis and urine biochemistries were used to direct the management. This shows the potential of Fly thru technology in aiding the clinician in studying fetal congenital anomalies. This can help guide the diagnosis and provide earlier and timely management of such cases.

Keywords: *Fetal abdominal mass, Fetal megacystis, Three-dimensional Ultrasound with Fly Thru technology, Case Report, Medicine*

Prenatal diagnosis of morbidly adherent placenta using gray-scale, color doppler, three-dimensional power doppler ultrasound and magnetic resonance imaging: a case report
Maquiran-Tambalo, Paulette A., Poblete, Anita Matilda F.

Morbidly adherent placenta (MAP) refers to a spectrum of conditions characterized by abnormal adherence of the placenta to the implantation site. It is usually associated with peripartum hysterectomies, excessive blood loss, and bladder and bowel injuries. Reliable antenatal diagnosis of MAP is needed as unexpected encounter with such condition can lead to catastrophic outcomes. It allows the pre-operative assembly of a multidisciplinary team in the surgical management of such cases, an approach which has been shown to improve maternal and fetal outcomes. A case of a morbidly adherent placenta diagnosed antenatally using gray-scale, Color Doppler, 3-Dimensional power Doppler ultrasound and Magnetic Resonance Imaging is reported. A multidisciplinary team consisting of OB - GYN ultrasonologist, radiologist, maternal fetal medicine specialist, gynecologic oncologist, anesthesiologist, neonatologist, internist, urologic-oncologist, vascular and general surgeons, was used to manage the case. Favorable maternal and fetal outcomes resulted from the use of this team. Prenatal diagnosis of MAP with gray-scale, Color Doppler, 3-Dimensional power Doppler ultrasound and Magnetic Resonance Imaging and the use of standardized imaging descriptors for AIP allowed the development of a multidisciplinary care team approach during delivery which provided a safe outcome for both mother and baby.

Keywords: *Morbidly adherent placenta, Abnormally Invasive Placenta, Gray-scale ultrasound, Color Doppler ultrasound, Three- Dimensional power Doppler ultrasound, Magnetic Resonance Imaging, Medicine*

Prevalence and factors associated with obesity at a primary preventive cardiology clinic: the Philippine Heart Center experience
Vilela, Gerald C. , Andres, Mark Donn D. , Valenzuela, Rhalp Jaylord L. , Yap, Emily Mae L.

Obesity has been linked to the development of type 2 diabetes mellitus (T2DM) and cardiovascular diseases. This study primarily aims to determine the prevalence of obesity among the Filipino patients in our institution since there have been no previous studies on this subset of patients. A cross-sectional analytical study of 2,078 patients at the Primary Preventive Cardiology Out-Patient Clinic of the Philippine Heart Center (PHC) was done from January 1, 2002 to December 31, 2017. The prevalence of obesity was determined using the World Health Organization (WHO) and Asian classification. Factors associated with obesity were determined using binary logistic regression analysis. A majority of the patients were females (1499, 71.14%) with a higher mean age compared to the male patients (57.67 ± 10.5 vs 55.66 ± 11.8 , $p < 0.001$). Hypertension (68.5%), coronary artery disease (37.1%) and T2DM (20.3%) were the most common co-morbid illnesses in both genders. The mean body mass index (BMI) was 25.8 ± 4.3 kg/m² for the female patients while it was 25.2 ± 4.1 kg/m² for the male patients ($p < 0.001$). The prevalence of obesity using the WHO and Asian classifications was 15% (n=312). Compared to the Asian criteria, there were significantly more patients classified as having normal weight (44.09% vs 24.95%, $p < 0.001$) and overweight (37.98% vs 19.13%, $p < 0.001$) using the WHO classification. Pre-obesity, an additional criterion of the Asian classification which was not adopted by WHO was seen in 37.98% of the patients. On multivariate analysis, female gender (OR 1.31, 95% CI [1.08-1.59]) $p = 0.006$ and T2DM (OR 1.25, 95% CI [1.01-

1.56], $p=0.42$) were significant factors associated with obesity while age (OR 0.98, 95% CI [0.98-0.99], $p<0.001$) was protective of obesity. The prevalence of obesity in our cohort was consistent with the worldwide prevalence reported by the WHO which underscores the need for effective weight management programs and primary preventive strategies to lower the prevalence and obviate the development of complications related to obesity. Female gender and T2DM were significant factors associated with obesity, while age was a significant protective factor of obesity.

Keywords: Obesity, Overweight, Filipinos, Primary prevention, Medicine

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0541

The prevalence of anxiety and depression among cervical cancer patients seen in a tertiary government hospital using the hospital anxiety and depression scale-english/pilipino version (HADS/HADS-P)

Cacas-David, Irene G. , Alvaro, Kristine I.

Due to improving survival longevity among cervical cancer patients, ensuring the quality of life becomes important to the gynecologist. Cancer, as a chronic disease, afflicts the patient both physically and psychologically. Anxiety and depression have been the two most common psychopathologic conditions affecting the cancer patient. Hence, recognizing their presence is important for holistic management. The objective of this study is to determine the prevalence of anxiety and depression among cervical cancer patients seen in a tertiary government hospital. This is a cross-sectional study performed on 384 cervical cancer patients from a tertiary government hospital. The Hospital Anxiety and Depression Scale-Pilipino (HADS-P) was the screening tool used to determine the presence of anxiety and depression. A score of 8 and above was used to detect depression and anxiety. Data were analyzed using Stata 15. Multivariate analysis was also utilized. Pearson chi square and Fisher's Exact tests were used. Variables that were significant were subjected to logistic regression analysis. The prevalence rates of anxiety, depression, and anxiety and depression among cervical cancer patients in our setting are 8.6%, 35.7%, and 6.5% respectively. Factors related to anxiety included receiving psychological support from family and friends, stage III/IV cancer, and being at 4 to 6 months from time of diagnosis. Depression had significant relationships with age, employment status, chemoradiation, and stage II cancer. Although rates in general were lower compared to other countries, the mere presence of anxiety and/or depression among cervical cancer patients implies the need for the gynecologist to give attention not only to the physical aspects of cervical cancer but to the psychological effects as well. Psychological screening could be performed even if by means of a simple validated tool in order to detect psychopathology early on.

Keywords: Anxiety, Cervical cancer, Depression, HADS/HADS-P, Medicine

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0542

Prevalence of high-risk HPV in women with biopsy-proven condyloma acuminata

Toral, Jean Anne B.

To determine the prevalence of HPV high risk positivity among women patients ages 30 to 65 with biopsyproven external genital warts (condyloma acuminata) specifically for HPV 16, HPV 18, and for other high risk types 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66/68, 73, and 82. A cross-sectional study was conducted at the Department of

Obstetrics and Gynecology Out-Patient Services of the Philippine General Hospital involving 57 women, 30 to 65 years old, with biopsy proven external genital warts or condyloma acuminata. These women underwent human papillomavirus (HPV) genotyping test for the high-risk types (HR-HPV) from cervical samples using the automated polymerase chain reaction (PCR) technology. Fifteen out the 57 subjects had at least one of the HR-HPV types for an overall prevalence of 26.3%. Of the 15, 8 (53.3%) had at least 2 HR-HPV types with one subject having the most number of types at 6. Among the strains, the most common is HPV 51 and 52 each with a prevalence of 8.77% followed by HPV 53 and 59 at 7% each. HPV 16 and 18 each only had a 3.5% prevalence the same as HPV 58, 73, and 82. HR-HPV positivity was most common in the 30 to 39 age group (80%), and equally in the nulligravid and the secundigravid (40% each). None had current or past cigarette smoking history and 33% had some form of hormonal contraception. The overall prevalence of high risk HPV (HR-HPV) among these 57 Filipino women with external genital warts is 26.3%. The higher prevalence of HPV 51, 52, 53, and 59 over HPV 16 and 18 in this group does not follow the usual epidemiological characteristics reported about this disease.

Keywords: *Condyloma acuminata, Human papillomavirus (HPV), Polymerase chain reaction (PCR), Medicine*

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NP

0543

The prevalence of soil-transmitted helminthiasis among Filipino pregnant women determined by fecalysis

Mercado, Alberto R. , Medina, Martin Antonio B., Sahagun, Rojannah T.

The Philippines is endemic to soil-transmitted helminthiasis, a neglected tropical disease which is inadequately diagnosed and treated especially in the pregnant and lactating population. It is important that the prevalence of STH is monitored routinely to assess the effectiveness of control programs and the provision of adequate treatment, hence decreasing its associated adverse outcomes. To determine the prevalence of STH among pregnant patients consulting for antenatal care in a tertiary provincial hospital using microscopic stool analysis. This is a cross-sectional study performed on 270 patients attending antenatal care from a tertiary provincial hospital. Microscopic stool analysis using the Kato-Katz technique was the diagnostic tool used to identify presence of intestinal parasites. Data were analyzed using Stata 15. Chi Square and Mann U Whitney Tests were utilized to determine statistical significance. Variables under the adverse perinatal outcomes were subjected to odds ratio to determine correlation among those tested positive for STH. The cumulative prevalence rate of STH is 20.7% and the most common organism identified is *A. lumbricoides*. Factors related to a high suspicion of STH are: older individuals; higher obstetric score; greater number of living children; increased maternal weight; anemic; underweight; lived in a family with higher number of household members; lived in a family with member treated with anthelmintics; lived in houses without water and toilet; lived in the areas of Maragondon, Mendez, Bailen, Cavite City, Noveleta and Bacoor. Moreover, preterm labor and small for gestational age fetus are the adverse perinatal outcomes identified suggestively related to STH.

Keywords: *Adverse perinatal outcomes, STH, Medicine*

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NP

Prevalence of subclinical hyperthyroidism in adults with hypertension

Buensalida, Rainier John, Lee-Chua, RLen

Hypertension in adult Filipinos is a significant concern for its increasing number (overall prevalence: 22.3). Percentage of thyroid function abnormalities is 8.53% with the greatest proportion of volunteers having subclinical thyroid disease. To our knowledge, there is no available Filipino-based study on hypertension and subclinical hyperthyroidism. The study aims to determine the prevalence of subclinical hyperthyroidism in adults with hypertension. It also aims to determine the difference among age groups and gender with subclinical hyperthyroidism and hypertension. This was a prospective cross-sectional prevalence study. Minimum sample size was computed at 80 but total sample taken was 98. Study population was taken from January 2019 to May 2019. All hypertensive patients with thyroid function test done in a nuclear medicine section in a tertiary institution were included. This study utilized prevalence rate. To determine the difference between age groups of patients with subclinical hyperthyroidism and hypertension, age groups were treated as follows: late adolescence (18–24), early adulthood (25–34), middle adulthood (35–60), late adulthood (61–75), very old age (76+). Significant difference of prevalence rate for each age group and gender was determined using analysis of variance and t-test respectively. The over-all prevalence of subclinical hyperthyroidism in hypertensive patients is 13.13% with most prevalence on late adolescence and male population (25% and 17.65% respectively). An increase in vigilance with thyroid disorders, especially subclinical hyperthyroidism might be warranted more in males in 18 to 24 years of age. An updated Filipino-based, or a larger Asian-based guideline which will encompass a larger population is needed, due to an increase in migration in this region. This Asian-based guideline will benefit healthcare standards in hypertensives in this region.

Keywords: *Subclinical hyperthyroidism, Hypertension, Hyperthyroidism, Medicine*

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Prevalence of urinary tract infection and antibiotic sensitivity among pregnant women having prenatal check-up at a tertiary hospital in Manila

Millar-Aquino, Martha, Tud, Raissa

The objective of this study is to determine the prevalence and the most common causative agent of urinary tract infection (UTI) in pregnant women having prenatal check-up at a tertiary hospital, as well as the antibiotic sensitivity of these organisms to selected antimicrobials that are currently recommended for use in the treatment of UTI in pregnancy (specifically Nitrofurantoin, Amoxicillin, Cephalexin, Cefuroxime, Amoxicillin with Clavulanic acid). The results of this study will not only update the hospital's biogram, it will also aid the physicians in prescribing patients with the most cost-effective regimen. Patients seen at the outpatient department were included in the study starting May 2017 up to September 2017. Patients with previous antibiotic intake during the current pregnancy were excluded. A questionnaire containing demographic data, prenatal history, checklist for symptoms, and consent were provided for each patient. As per guidelines, urine gram stain and culture studies were requested during their prenatal visit. All urine specimen were sent to the same laboratory for microscopy and culture. Results were analyzed using SPSS v 23.0 The prevalence of urinary tract infection in pregnant patients having prenatal care at a tertiary hospital in Manila was 15.6%. The most common isolates were still *E. coli* and *Staphylococcus*. Symptoms were not reflective of the presence of UTI and previous prenatal care did not affect the presence UTI. Analysis of sensitivity and resistance patterns of the isolated organisms showed increasing resistance to the commonly used antibiotics given to pregnant patients, especially Co-Amoxiclav. Cephalosporins, on the other hand, remain to have good sensitivity. Urinary tract infection is prevalent among pregnant women having prenatal check up at a tertiary hospital. It is recommended that guidelines on the diagnosis of UTI in pregnancy be strictly followed so that management will be culture-guided, thus preventing the development of antibiotic resistance.

Keywords: Antibiotic sensitivity, Asymptomatic bacteriuria, Urinary tract infection in pregnancy, Medicine

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NP

0546

Primary peritoneal carcinoma with long term survival: a case report
*Gorgonio, Liza Karina I. , Luna-Sun, Ma. Patricia , Gorgonio, Nephtali M. , Rodriguez, Jan Gayl F. ,
Merencilla, Maria Roberta D. , Yatco-Buenaventura, Alexanderia G.*

Primary peritoneal carcinoma is rare, presents with non-specific abdominal symptoms, is usually diagnosed late and is associated with a poor prognosis. A 51-year-old female with Primary Peritoneal Carcinoma Stage III-C, was initially treated with cytoreductive surgery and intravenous paclitaxel and carboplatin. After 28 months in remission, she developed tumor recurrence. She underwent tumor excision followed by combined intravenous paclitaxel and intraperitoneal carboplatin. The patient is alive and disease-free 5 years after the initial operation. This case was reported to inform our clinicians that the peritoneum can be the primary site of a rare malignancy. Prognosis may be poor but long-term survival can be achieved in younger patients with good performance status. Having a tumor that is sensitive to platinum-based chemotherapy can contribute to a longer survival even if the tumor was sub-optimally reduced.

Keywords: Chemotherapy, Cytoreductive Surgery, Primary Peritoneal Carcinoma, Medicine

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0547

Primary spinal epidural non-Hodgkin's lymphoma: a case report
Payad, Kristianne A., Librado, Dax Ronald O.

Non-Hodgkin's lymphomas (NHLs) are a varied group of malignancy originating in the lymphatic system. As a subset of lymphomas, primary spinal epidural lymphomas are diagnosed when there are no other recognizable sites of lymphomas at the time of diagnosis. It mimics other spinal diseases making the diagnosis difficult to establish as well as in obtaining tissue diagnosis. We present an atypical case of a 45-year-old female who presented initially with back pain then eventual loss of sensory and motor function of the lower extremities, further work up showed primary spinal epidural NHL. This is a case of a 45-year-old female with chief complaint of back pain. Magnetic resonance imaging (MRI) of the thoracic spine showed nonspecific epidural soft tissue mass at T5 to T6 level compressing the spinal cord. Operative procedure was done with histopathology of the epidural lesion consistent of NHL. Immunohistochemical staining showed CD20 (+), thus a diagnosis of diffuse large B cell lymphoma (DLBCL) was made. Patient underwent six cycles of cyclophosphamide, doxorubicin, vincristine, prednisone (CHOP) regimen. Signs and symptoms of primary spinal epidural NHL often overlaps its manifestations with other spinal diseases. A high index of clinical suspicion warrants inclusion of such neoplastic condition in determining the exact and definitive diagnosis of cases manifesting spinal compression.

Keywords: Case report, Primary spinal epidural non-hodgkins lymphoma, Spinal cord compression, Lower extremity weakness, Back pain, Epidural mass, Medicine

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Primitive trigeminal artery: a route for emboli and collateral circulation

Tan, Frena C.

Persistent carotid-basilar anastomoses are potentially clinically relevant anomalies of the intracranial vasculature. The trigeminal artery is the largest and persists for the longest embryonic period among the anastomoses. The increasing use of arteriographic procedures has augmented its incidence to 0.1-1%. This is a case of a 39-year-old male who presented with acute occipital lobe infarct after sustaining a traumatic right carotid dissection. A 39-year-old male was brought in to the emergency room after a 200-kilogram sack fell on his upper back. He landed on his chest with his head rotated to the right and sustained multiple lacerations on his face and chest. There were noted acute bilateral loss of vision, lethargy and unsteady gait. Computed tomography (CT) scan of the brain showed neither infarct nor hemorrhage. However, magnetic resonance imaging (MRI) of the brain revealed an acute occipital lobe infarct. The patient was started on antiplatelet. Further workup revealed a totally occluded right common carotid artery upon carotid duplex. His vision improved to be able to perceive light and hand movement. Further workup was done as an outpatient. A week after hospital discharge, patient's vision improved to left bilateral hemianopsia. His gait has improved and was able to walk with balance. A cerebral angiogram later revealed a large bilateral persistent primitive trigeminal artery (PPTA). The right PPTA provided collateral flow to the right cerebral hemisphere. This primitive collateral vessel is believed to have served as a route for emboli to be thrown to the posterior circulation in the occipital lobe. The consideration of a persistent primitive carotid-basilar anastomoses may elucidate the physician when a gap between patient's manifestation and imaging studies exist. The presence of persistent carotid-basilar anastomoses may herald other vascular anomalies, it may offer as alternative endovascular access, or may serve as access for emboli passage.

Keywords: *Primitive trigeminal artery, Stroke, Emboli, Carotid dissection, Case report, Medicine*

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Profile of the Adult Filipino with High Blood Sugar in the 8th National Nutrition Survey: Validation of the Philippine Guidelines for Screening

Jimeno, Cecilia A.

Practice guidelines on diabetes in the Philippines have recommendations for screening using risk factors with thresholds based on international data. This paper investigated whether there is a basis to support these screening recommendations using data from the 8th Philippine National Nutrition Survey (NNS). This is a cross-sectional analytic study of data from the results of the 8th Philippine NNS that was conducted across the country from June 2013 to April 2014. Crude odds ratios were obtained for each variable to determine their association with diabetes, and multivariate logistic regression analysis was performed to assess the independent association of demographic and clinical characteristics with diabetes. These variables were found to be significantly associated with diabetes and impaired fasting glucose: male gender; age > 40 years; hypertension with BP > 140/90 mm Hg; triglyceride levels > 150 mg/dL; overweight with BMI > 23 kg/m²; and abdominal obesity with waist circumference ≥ 90 cm in male and ≥ 80 cm in female adults. The risk factors associated with diabetes mellitus among adult Filipinos are similar to other countries but the development of diabetes is associated with relatively younger age, and lower BMI and waist circumference.

Keywords: *Risk factors, Diabetes mellitus, Philippines, Medicine*

Prognostic scoring index for intrauterine insemination success among Filipino couples

Zamora, Brenda Bernadette B. , Bermio, Gladys Anne M.

Objectives: To identify the clinical factors associated with intrauterine insemination (IUI) success among Filipino couples and incorporate the significant clinical factors in a formula for a prognostic scoring index for the success of IUI. This is a review of cases who consulted for infertility and underwent IUI at a tertiary hospital between January 2007 and December 2014. The variables considered for analysis were female age, duration of infertility, etiology of infertility, method of sperm processing, number of preovulatory follicles, total motile insemination count (TMSC), and sperm motility. The outcome measure was determined either by a positive urine or serum beta HCG or a gestational sac on transvaginal ultrasound. Results from the logistic regression analysis were used to develop prognostic scoring index for IUI success. Computed scores were plotted in a Receiver Operating Characteristic Curve and cut off values were determined. The overall pregnancy rate in this study was 10.7%. Duration of infertility (OR 10.33, 95% CI 3.488-30.602) and sperm motility (OR 5.30, 95% CI 1.830-15.331) showed the strongest significant association with the occurrence of pregnancy. Odds of pregnancy after IUI are likewise increased in female age of < 32.5 years (OR 2.52, 95% CI 1.704-3.734), swim-up method (OR 2.17, 95% CI 1.383-3.415) and TMSC of >19.5 million (OR 1.78, 95% CI 1.076-2.954). The odds of successful pregnancy among patients whose duration of infertility is < 2.5 years and who have a sperm motility count of > 67.5 are more than thrice (OR 3.13, 95% CI 0.095-0.990), compared to those with duration of infertility of > 2.5 years. The formulated prognostic scoring index for IUI success was 18.6, with specificity of 91.1%, sensitivity of 39.4%. Duration of infertility, female age, sperm motility, TMSC and sperm processing method significantly affect the success of IUI success among Filipino couples studied. Using the formula derived, with a sensitivity of 91% and a sensitivity of 39, couples with a score of >18.6 are more likely to get pregnant 4 times more than those with a score of less than 18.6.

Keywords: *Intrauterine insemination, Prognostic scoring index, Infertility, Medicine*

Prophylactic administration of oral allopurinol with standard IV hydration in preventing contrast induced nephropathy in patients undergoing cardiac catheterization: a meta-analysis and systematic review

Chiu, Harold Henrison , Larrazabal, Jr., Ramon , Perez, Blessie Marie, Tan, Rey Jaime

Contrast induced nephropathy (CIN) is associated with increased morbidity and mortality of patients. One of the mechanisms that have been investigated in the development of CIN is the presence of hyperuricemia. Thus, it has been postulated that using urate lowering agents may be beneficial in preventing CIN. This report aims to determine the efficacy of giving allopurinol along with standard IV hydration in reducing the incidence of contrast induced nephropathy after coronary catheterization. We conducted an electronic search using PUBMED, MEDLINE, EMBASE, Cochrane Central Register of Controlled Trials, Cochrane Kidney and Transplant register of Studies, Google Scholar, and Research Gate. Studies fulfilling the inclusion and exclusion criteria were quality assessed based on the criteria provided in the Cochrane Handbook for Systematic Reviews of Interventions. Only published full manuscripts written in English from 1966 to April 2018 were included. The incidences of CIN were analyzed using a random effects model in Review Manager (Rev Man) Version 5.3 with a 95% confidence interval. Five studies of 2,033 were included with a total of 753 patients. Results showed that there is a 63%

decrease in CIN [RR 0.37 (25 to 0.54, 95% CI, Z 5.10, p 0.00001) in the allopurinol group compared to those who received hydration alone. When adjusted for heterogeneity by using the random effects model, there remains a 35% decrease in the incidence of CIN [RR 0.65 (0.43 to 0.99, 95% CI, Z 2.02, p 0.04) in the allopurinol group. Allopurinol administration may be protective in the development of CIN in patients undergoing coronary interventions. However larger, multi centered randomized controlled trials are needed to validate this claim.

Keywords: *Contrast induced nephropathy (CIN), Allopurinol , Standard IV hydration, Medicine*

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0552

Prophylactic balloon occlusion of the internal iliac arteries in two cases of placenta accreta syndromes

Tria, Ma. Cecilia D., Tabaquero, May Anne V.

Placenta accreta syndrome results from the abnormal adherence of the placenta to the myometrium due to the absence of the decidua basalis and imperfect development of the Nitabuch layer. It causes serious obstetric morbidity due to the risk of massive hemorrhage. Balloon occlusion of internal iliac arteries has been used prophylactically to decrease hemorrhage in cesarean hysterectomy for placenta accreta. In this paper, two cases of placenta accreta syndromes wherein bilateral internal iliac artery balloon occlusion was done prior to cesarean hysterectomy are presented. Case 1 is a 50- year- old G4P0 (0030) pregnancy uterine who came in at 33 3/7 weeks age of gestation for fetal surveillance. Case 2 is a 38- year- old G4P2 (2012) pregnancy uterine who came in at 33 4/7 weeks age of gestation for decreased fetal movement. Both cases were successfully delivered via cesarean hysterectomy with prophylactic balloon occlusion under a multidisciplinary team in a tertiary care center.

Keywords: *Internal iliac arteries, Balloon occlusion, Placenta accreta, Medicine*

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0553

The prophylactic use of tranexamic acid for the reduction of blood loss after cesarean section and vaginal delivery in primiparas at a tertiary hospital in Manila: A Single-blinded randomized controlled trial

Martin, Carolina Paula C. , Aguedan, Jo-An Marie G.

To determine whether Tranexamic Acid is effective in reducing postpartum blood loss in vaginal and cesarean deliveries and if intravenous Tranexamic Acid can be used as a prophylaxis to reduce blood loss for vaginal and cesarean deliveries in primiparas. This is a Single-Blinded Randomized Controlled Trial wherein two groups were assigned for the patients included, one for primiparas undergoing vaginal delivery and the other group for primiparas undergoing cesarean section. A dose of 2 grams of Tranexamic acid (given during the second stage of labor and over 30 minutes before abdominal delivery) were compared to primiparas to whom Tranexamic acid was not given. Blood loss was estimated from the main difference between the pre- and post-test hemoglobin and hematocrit obtained for each group and measured during two periods: first period was 30 minutes before delivery and the second from the end of the delivery of the baby to 2 hours postpartum. The difference was then compared and was used in the computation of the statistics, where t-test on two independent samples was utilized. One hundred twenty women were recruited to this study. The study was able to determine that those assigned to the Tranexamic acid or treatment group had significant reduction of postpartum blood loss as compared to the control

group. This study demonstrates that use of Tranexamic Acid prior to vaginal or abdominal delivery can reduce blood loss and maternal morbidity in women.

Keywords: *Tranexamic acid, Postpartum hemorrhage, Hemoglobin, Hematocrit, Medicine*

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0554

A prospective cross-sectional analysis on the adherence to the four time-bound interventions of the essential intrapartum and newborn care program (EINC) in a private tertiary hospital in Metro Manila
Manahan, Maria Regina P. , Ramirez, Ana Karina S.

The fourth Millennium Development Goal set out by the United Nations in 2000 aims to reduce under-five mortality globally, of which the major contributor is neonatal mortality. Aside from the direct causes of neonatal deaths, newborns may die due to lack of access to the basic care. The World Health Organization started Essential Intrapartum and Newborn Care (EINC), an evidenced-based program that adapts safe and quality care for newborns and mothers. In response to this call, the Philippine Department of Health under Administrative Order 2009-0025, instituted Unang Yakap, a protocol comprised of four time-bound interventions. These are immediate drying, uninterrupted skin-to-skin contact, delayed cord clamping and early initiation of breastfeeding. This should be performed immediately and sequentially upon birth up to the 1st hour of life. It is the aim of this study to assess the adherence of the obstetricians to performing these time-sensitive interventions during deliveries and to uncover substandard practices. This prospective, cross-sectional, single-center study was conducted for 1 year. The birthing process was observed from pushing up to the 1st hour after birth. The timing and sequence of each newborn care intervention was recorded in a standardized assessment tool as they were performed. Other interventions not specified in the tool were also recorded. The steps of EINC were performed in 100% of deliveries. However, total adherence to the 4 time-bound interventions was less than 50%. This direct observational study shows that obstetricians were compliant to EINC in all the deliveries but adherent to the protocol in less than half only. Unnecessary interventions were observed although substandard practices were not demonstrated. The compliance of all birthing events to the protocol implies that EINC is a simple and uncomplicated procedure. Full adherence can be accomplished if physicians are re-oriented to the benefits of EINC.

Keywords: *Newborn Care (EINC), World Health Organization, Medicine*

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0555

Pseudomyxoma peritonei: revisited
Dueñas, Rommel Z. , Reyes, Lylah D. , Cheng, Mary Grace O.

Bleeding after menopause raises suspicion of malignancy; more so, if combined with increased abdominal girth and constitutional symptoms. This is a case of a 74-year-old Gravida 10 Para 8 (8026) who presented with generalized abdominal pain, enlargement, bloatedness and vaginal bleeding. Ultrasound revealed a complex abdominopelvic mass, likely ovarian in origin. Tumor markers CA-125 and CA-199 were elevated. Endometrial curettage with frozen section revealed Leiomyosarcoma. It was followed by exploratory laparotomy revealing gelatinous material in the peritoneum with seeding of mucoid material into the omentum, ovary and appendix.

Frozen section of the right ovary revealed Atypical Mucinous Proliferative Ovarian Tumor (APMOT). Final histopathology result of the endometrial curetting revealed adenomatoid tumor of the uterus. Immunohistochemical staining with desmin and caldesmon revealed negative results implicating the absence of leiomyosarcoma. Final histopathology results were consistent with Disseminated Peritoneal Adenomucinosi (DPAM). Immunohistochemical staining with CK20 was positive and CK7 was negative, consistent with metastases from a primary gastrointestinal tumor. Chemotherapy in the form of FOLFOX regimen was contemplated. However, the patient was lost to follow up.

Keywords: *Atypical, Adenomucinosi, Disseminated, Mucinous, Ovarian tumor, Pseudomyxoma peritonei, Medicine*

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0556

Pulseless: a rare case of successful pregnancy complicated with active Takayasu's arteritis

Miguel, Rhoselle P., De La Concepcion-Co, Lily Rose

Takayasu's arteritis or Pulseless Disease is a rare inflammatory disease of the arteries that affects women of childbearing age. Vigilance is necessary, since they can develop devastating complications such as hypertension, multiple organ dysfunction, stenosis that hinder regional blood flow, and restricted intrauterine growth. The objectives of this paper are to present a rare case of successful pregnancy in active Takayasu's arteritis, to discuss complication of active Takayasu's arteritis in pregnancy, and to discuss management of pregnancy with active Takayasu's arteritis. A case of a 35-year-old primigravida, who spontaneously conceived with an active case of Takayasu's arteritis is presented. Currently, management of Takayasu's arteritis is ambiguous and no consensus is offered during pregnancy. An interdisciplinary collaboration of obstetricians, perinatologists, rheumatologists, nephrologists and pediatricians are indispensable to improve maternal and fetal prognosis.

Keywords: *Takayasu's arteritis, Pulseless Disease, Medicine*

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0557

Radial artery pseudoaneurysm following transradial artery coronary angiography: a case report

Alimurung, Benjamin N. , Chua, Jeffrey L. , Alimurung, Kyle Martin S. , Labrador, Lauren Angelica R., Sombrero, Maria Cristina A.

This report aims to raise physician clinical awareness of radial artery pseudoaneurysm (RAP) and promote early recognition of this potentially serious complication. The article highlights various proposed treatment strategies in the management of this condition. Radial artery pseudoaneurysm is a rare potentially serious complication following transradial artery coronary angiography for left heart catheterization and percutaneous coronary intervention. Risk factors associated with the development of RAP include multiple arterial puncture attempts, use of systemic anticoagulation, inadequate hemostasis following post-procedural compression, vascular site infection, use of larger sheaths, female gender, age of 70 years and older, diabetes mellitus, obesity and/or patients with high body mass index.¹⁻³ Conservative medical treatment and/or surgical repair are the primary therapeutic approaches in the management of RAP. Transradial artery access is associated with a significantly lower risk of

major bleeding and vascular access site complications, reduces morbidity and mortality compared with the transfemoral approach. It is important to recognize though that complications do still occur with the transradial approach. RAP is one such entity wherein prevention is key - with adequate post-procedural compression, frequent observation, and careful assessment of the radial access site.

Keywords: *Coronary intervention, Pseudoaneurysm, Radial artery, Transradial, Medicine*

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0558

Raging vessels: a case report on a young pregnant overt diabetic patient with cerebral cavernous malformation presenting as pontine hemorrhage and hepatic hemangioma

Penolio, Vaneza Valentina L. , Paulino-Morente, Joanna Marie, Cacas, Ireen

Reported is a case of a 29-year old Gravida 5 Para 4(4004), 23 6/7 weeks pregnant, known diabetic with hepatic hemangioma, who previously underwent ligation of ruptured esophageal varices, was admitted for the first time on February 21, 2015 due to left-sided hemiparesis. Identifying the cause of the pontine bleed and its possible association with coexisting medical problems was an arduous process since there are no existing management guidelines. Emergency Caesarean Section with bilateral tubal ligation under general anesthesia was done at 35 weeks AOG and a live baby girl was delivered with an Apgar score of 9,9. Magnetic Resonance Angiography (MRA) of intracranial vessels postpartum revealed a Cavernoma. This case is of particular importance due to the following reasons: 1.) Cerebral Cavernous Malformation (CCM) is a rare disease, 2.) There is scant data associating CCM with pregnancy, 3.) Current literature has not reported CCM with Hepatic Hemangioma in a single patient, 4.) No data has linked it with diabetes mellitus, 5.) There are still no management guidelines of CCM in pregnancy, 6.) A multidisciplinary approach is necessary for optimal maternal and fetal outcomes.

Keywords: *Cavernous malformation, Cerebrovascular bleed, Pontocerebellar haemorrhage, Cavernous angioma, Liver hemangioma, Medicine*

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0559

A randomized controlled trial: comparison of malunggay (*Moringa oleifera*) and ferrous sulfate in preventing anemia in pregnant patients in the outpatient department of a tertiary hospital (January 2013 – July 2016)

Cortez, Antonio C. , Caraos, Angeli Rose O.

To compare Malunggay (*Moringa oleifera*) with ferrous sulfate in preventing anemia among pregnant patients in the Out Patient Department of a Tertiary Hospital. To determine the effect of Malunggay (*Moringa oleifera*) supplements in the hemoglobin and hematocrit levels during pregnancy. To determine if Malunggay (*Moringa oleifera*) capsules can be better tolerated by pregnant patients in the Out Patient Department of a Tertiary Hospital (Author's abstract)

Keywords: *Moringa oleifera, Hemoglobin, Hematocrit, Medicine*

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A randomized controlled trial on the efficacy of methotrexate in preventing postmolar gestational trophoblastic disease among patients with high-risk complete hydatidiform mole

Saravillo-Saniel, Katherine B. , Billod, Jimmy A. , Festin-Dalawangbayan, Maria Anna Luisa L. , Soriano-Estrella, Agnes L.

This study aimed to determine the efficacy of methotrexate in preventing postmolar gestational trophoblastic disease (PMGTD) among patients with high-risk complete hydatidiform mole. This was a double-blind randomized controlled trial carried out from 2007 to 2013. A total of 99 patients with high-risk complete hydatidiform mole who underwent suction curettage were randomly allocated to either the treatment or control group. The treatment group received methotrexate while the control group received a vitamin B complex. The number of patients who developed PMGTD in each group was recorded. All tests of significance were carried out at a .05 alpha level of significance, 95% confidence interval. There was no significant difference between the two groups in terms of age, gravidity, baseline β hCG, age of gestation, and corpus size. The overall incidence of PMGTD was 27.9%. For the per protocol analysis, a total of 30 patients received chemoprophylaxis while 31 patients received placebo treatment. The total incidence of PMGTD was 16.67% for the treatment group and 38.71% for the control group. The computed risk ratio was 0.43 (95% C.I.: 0.17-1.07, p value = 0.07). Results failed to reach statistical significance but the large fall-out rate may have significantly affected the outcome of the study. Methotrexate chemoprophylaxis may still be useful in preventing PMGTD, particularly in settings where the incidence of hydatidiform mole is high and there is high probability that patients will fail to follow the stringent β hCG monitoring schedule after molar evacuation.

Keywords: *Gestational trophoblastic neoplasia, Complete hydatidiform mole, Chemoprophylaxis, Methotrexate, Postmolar gestational trophoblastic disease, Medicine*

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Randomized, single-blinded comparison of efficacy, safety and tolerability of metronidazole 750mg-miconazole 200mg vaginal suppository vs. metronidazole 500mg-nystatin 100,000 IU vaginal suppository in the treatment of bacterial vaginosis, vulvovaginal candidiasis, trichomoniasis, and mixed vaginal infections

Sison, Olive , Fallarme, Analyn F. , Bravo, Sybil Lizanne R. , Cagayan, Ma. Stephanie Fay S., Gabaldon, May S.

This randomized, single-blind, two-arm controlled study compared the efficacy, safety, and tolerability of an intravaginal suppository preparation containing metronidazole 750mg + miconazole 200mg (Neopenotran Forte) with another vaginal preparation containing metronidazole 500 mg + nystatin 10000 IU (Flagystatin) in the treatment of bacterial vaginosis (BV), candidal and trichomonal vulvovaginitis (CVV, TV), mixed vaginitis and in the prevention of secondary candidal vulvovaginitis. Women ages 18-45 years with chief complaints of abnormal vaginal discharge or vaginal/vulvar itching were examined and microbiologic confirmation of BV, VVC, TV or mixed infection was made. They were then randomly assigned to receive either treatment once daily (nightly) for 7 days. A total of 261 subjects had evaluable clinical and microbiological findings at the end of the study. Test of cure by Amsel criteria and Nugent score were performed twice after treatment. The overall test revealed that microbiological cure rate is significantly different between the two treatment groups. The odds of being cured microbiologically is 2.35 times more in the metronidazole 750mg + miconazole nitrate 200mg group

compared to the metronidazole 500 mg + nystatin 10000 IU group. However, no significant difference in the clinical cure between the two groups was found. Both drugs are safe and convenient to use.

Keywords: *Bacterial vaginosis, Vulvovaginal candidiasis, Trichomonal vaginitis, Mixed vaginal infections, Metronidazole - miconazole vaginal suppositories, Metronidazole 500 - nystatin vaginal suppositories, Medicine*

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0562

A rare case of epithelioid trophoblastic tumor: an ultrasound dilemma

Bolo-Paiso, April Anne P., Amosco, Melissa D. L.

Gestational trophoblastic neoplasia (GTN) represents the malignant end of the gestational trophoblastic disease spectrum and includes the more common types, invasive mole (IM) and choriocarcinoma (CC) and the rare types, placental site trophoblastic tumor (PSTT) and epithelioid trophoblastic tumor (ETT). This is a case of a 42-year-old, G2P2 (2002) patient who complained of left lower quadrant pain and a 1 year history of amenorrhea. Urine pregnancy test done just prior to the surgery revealed positive result. Pre-operative diagnosis was abdominopelvic mass mass probably Sarcoma, ovarian new growth probably benign, right. Patient underwent exploratory laparotomy, adhesiolysis, bilateral internal iliac artery ligation, total hysterectomy with bilateral salpingo-oophorectomy, targeted biopsy, appendectomy, JP drain insertion under epidural anesthesia. Final histopathologic and immunohistochemical diagnosis is Epithelioid Trophoblastic Tumor. Differential diagnoses, diagnostics, and therapeutic options are presented, with focus on the description of sonographic features.

Keywords: *Ultrasound, Uterine sarcoma, Epithelioid trophoblastic tumor, Medicine*

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0563

A rare case of malignant transformation of mature cystic teratoma: a case report

De Castro-Malig, Marie Aleli, Loria, Ma. Elizabeth E.

This case report shows a rare case of squamous cell carcinoma arising from a mature cystic teratoma in a 59-year-old postmenopausal woman. Malignant transformation occurs in 1% of all cases of mature cystic teratomas and due to its rarity, there is no established protocol regarding optimal diagnosis and management. Preoperative diagnosis was difficult due to nonspecific symptoms such as abdominal mass and abdominal pain present in this patient. The surgery was planned based on the large size of the tumor on imaging, menopausal age and a family history of breast cancer in the family. She subsequently underwent Total Abdominal Hysterectomy with Bilateral Salpingo-oophorectomy, Frozen Section, Bilateral Lymph Node Dissection, Infracolic Omentectomy and Right Internal Iliac Artery Ligation. Final diagnosis was confirmed post operatively with the final histopathologic report. This report would show that proper risk assessment and preoperative planning would optimize management of even rare cases of malignant tumors.

Keywords: *Malignant Transformation, Teratoma, Squamous Cell Carcinoma, Medicine*

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2015 September,
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A rare case of ruptured mycotic infrarenal aortic aneurysm secondary to *Salmonella* species

Paz, Joel , Rico, Aquileo , Rondilla, Warren , Ecarma, Raquel Victoria , Llarena, Frederick R. , Yap, Emily Mae , Toledano, Bryan Rene

Ruptured mycotic aortic aneurysm is a rare and life-threatening condition. An early and proper initiation of antibiotics aside from aneurysmal repair is of paramount importance. The typhidot IgG and IgM may help with this dilemma, especially when the blood culture is negative and during the waiting period for the aortic sample result. A 47-year-old male Filipino with type 2 diabetes mellitus presented with severe back pain for one month and intermittent fever for three weeks. Complete blood count showed anemia and leukocytosis with predominance of neutrophils. On computed tomography of the aorta, a segmental calcification and wall discontinuity in the right posterolateral wall of the infrarenal abdominal aorta with heterogeneous collection of blood in the retroperitoneal region was seen and aortic rupture secondary to mycotic aneurysm was considered. He underwent emergency abdominal aortic aneurysm repair with debridement, antibiotic lavage, aortoiliac grafting, anastomosis and omental packing. The typhidot IgG and IgM test was positive and was given ceftriaxone 2gm/IV every 24 hours for six weeks. Blood cultures did not reveal significant growth of any pathogen. The aortic wall culture showed heavy growth for salmonella species sensitive to ceftriaxone, confirming and guiding the management. He was then discharged improved. A mycotic aneurysm secondary to salmonella should be one of the considerations in an adult male diabetic presenting with prolonged fever, abdominal and back pain with or without a tender pulsatile mass. The Typhidot test is an easy and affordable test that allows rapid detection of salmonella infection. Early surgical intervention and antibiotics are the treatment of choice.

Keywords: *Mycotic aneurysm, Salmonella, Typhidot, Case report, Medicine*

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Recognizing the link between ovarian teratoma and autoimmune encephalitis: A case report of ovarian teratoma-associated anti-N-methyl-D-aspartate receptor encephalitis

Toral, Jean Anne B. , Señeris, Aubrey Y.

A 36-year old nulligravid who initially presented with a one-week history of flu-like symptoms suddenly developed behavioral changes, agitation and irritability. Diagnostic tests were done and empiric treatment for viral encephalitis were initiated. Symptoms persisted with progressive unresponsiveness and episodes of seizure. Hypoventilation from dysautonomia required mechanical ventilation. Elevated levels of immunoglobulin on cerebrospinal fluid (CSF) and deterioration despite treatment raised suspicion for an autoimmune encephalitis. A referral to a gynecologist to rule out an ovarian focus was done. Ultrasound and biopsy established the presence of ovarian teratoma. The diagnosis of anti-N-methyl-D-Aspartate receptor encephalitis was confirmed when the patient's serum and CSF tested positive for these antibodies. In addition, her CSF was also positive for anti-alpha-amino-3-hydroxy-5-methylisoxazole-4-propionic acid receptor (Anti-AMPAr) antibodies. In the Philippines, this was the second documented case of Anti-NMDAr encephalitis associated with ovarian teratoma and the first to have two antibodies present causing encephalitis.

Keywords: *Dermoid cyst, Ovarian teratoma, Anti-NMDAr encephalitis, Anti-AMPAr encephalitis, Medicine*

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2016 September,

Rectus abdominis endometriosis: a case report

Tanes, Ann Kamille, Dichoso, Marian C.

Abdominal wall endometriosis is suspected in patients who complain of cyclic tender mass within or adjacent to a caesarean section scar. Ultrasound, magnetic resonance image and computed tomography are helpful tools used to diagnose abdominal endometriosis however histologic examination is required for confirmation. The standard treatment for abdominal wall endometrioma is surgical excision. Proper surgical techniques could prevent abdominal wall endometriosis after uterine surgery. This is a case of a 30 G2P2 (2002) who presented with paraumbilical pain after 2 cesarean sections and previous excision of abdominal wall endometrioma. She underwent excision of the mass and histopath confirmed the presence of endometriosis in the rectus abdominis muscle. Abdominal wall endometrioma is often found in the subcutaneous fatty layer. Its presence in the rectus abdominis is quite rare.

Keywords: *Abdominal wall endometriosis, Rectus abdominis endometriosis, Medicine*

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NP

Recurrent ectopic pregnancy after bilateral salpingectomy: a case report

Mortel, Bernadette MAYumi T., Pacquing-Songco, Debby F.

Recurrent ectopic pregnancy after bilateral salpingectomy is a very rare condition, with only one previous case reported. This is a case of a 29 year old G4P0(0030) who presented with abdominal pain at the background of missed menses and positive pregnancy test, two years after bilateral salpingectomy. Intraoperatively, a 5x4cm bleeding mass was visualized at the right distal tubal remnant, containing an embryo and decidualized tissues. Excision of the adnexal mass and bilateral tubal remnants were completed. In such cases, total salpingectomy is the gold standard in preventing recurrence of another extrauterine gestation. In the presence of tubal remnants, a hysterosalpingography is recommended to assess tubal patency. Ultimately, the rarity of this case demands prompt recognition of risk factors, clinical presentation and appropriate management. It underscores the importance of maintaining vigilance, with high index of clinical suspicion in all women in the reproductive age group, especially those with risk factors.

Keywords: *Amenorrhea, Bilateral salpingectomy, Recurrent ectopic pregnancy, Tubal Patency, Medicine*

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NP

Recurrent hydatidiform mole with NLRP7 mutation: the first confirmed case in the Philippines

Medina, Martin Antonio B., Soriano-Estrella, Agnes L.

High gravidity hydatidiform mole (HM) without normal pregnancy is very rare. The challenge of managing such cases will dwell on the concern of having normal conception versus having another molar gestation and its neoplastic sequelae. Presented in this paper is a case of a 32-year-old, gravida 5 para 0 (0040) who was admitted for the management of her fifth molar pregnancy. She underwent suction curettage and administration of methotrexate chemoprophylaxis. Genetic testing was done, which revealed a homozygous mutation in NLRP7, the gene implicated in recurrent molar gestations. This paper discusses the proper approach to determine the cause of recurrent molar pregnancies, as well as the management and prognosis of such cases.

Keywords: *Familial hydatidiform mole, Recurrent hydatidiform mole, NLRP7 mutation, Medicine*

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NP

Recurrent Paget's disease of the vulva in a split-thickness graft

Imperio-Onglao, Romelyn April P., Luna, Jericho Thaddeus P.

Extramammary Paget's disease (EMPD) of the vulva is a rare vulvar neoplasm but commonly arises during the postmenopausal period. Intraepithelial Paget's disease may persist for prolonged periods without demonstrating invasion but with high rates of recurrence. Appearance of Paget's disease in a split-thickness skin graft, is associated with an occurrence outside the grafted area. It demonstrates retrodissemination as the pathologic process hypothesized in the spread of the disease within the skin via lymphatics and vessels creating tissue bridges between sites of involvement. We present a case of an 81-year-old female, the patient came in for complaints of vulvar pruritus beginning at the left inguinal area three years prior to her diagnosis. She consulted with a dermatologist and was initially treated with steroids and emollients. Persistence of symptoms and enlargement of the lesion prompted a vulvar punch biopsy which showed Paget's disease and referral to the Gynecologic Oncology service. Wide local excision with split-thickness skin grafting was performed. However, one year after her surgery, patient noted vulvar pain and palpable vulvar lesions. Biopsy was done which showed Extramammary Paget's Disease recurrence. Patient underwent repeat wide local excision with frozen section, and split-thickness skin grafting. With the aid of frozen section, the intraepithelial involvement was noted to spread beyond the grossly apparent lesion. After 6 months post re-excision, patient noted vulvar pruritus and palpable vulvar lesions. Biopsy was done which showed Extramammary Paget's Disease recurrence. Due to the proximity of the lesion to the sphincter and need for a colostomy, the patient did not consent for re-excision. Imiquimod 5% was chosen as the mode of treatment. The challenges of interventions are to remove or treat disease that may not be visible, without overtreatment and to minimize morbidity from radical surgery. Surgery remains the primary management for EMPD of the vulva. Imiquimod 5% can be used in recurrences. Despite the advances in the knowledge and management of vulvar Paget's disease the high rate of recurrent disease remains a challenge for optimal management and would require frequent and long-term follow-up.

Keywords: *Extramammary Paget's disease, Vulva, Vulvar neoplasm, Imiquimod 5%, Medicine*

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(Filipiniana Analytics)
NP

Regulation of growth in *Drosophila melanogaster*: the roles of mitochondrial metabolism

Jacobs, Howard T. , George, Jack , Kemppainen, Esko

Mitochondrial functions are often considered purely from the standpoint of catabolism, but in growing cells they are mainly dedicated to anabolic processes, and can have a profound impact on the rate of growth. The *Drosophila* larva, which increases in body mass ~200-fold over the course of ~3 days at 25°C, provides an excellent model to study the underlying regulatory machinery that connects mitochondrial metabolic capacity to growth. In this review, we will focus on several key aspects of this machinery: nutrient sensing, endocrine control of feeding and nutrient mobilization, metabolic signalling, protein synthesis regulation and pathways of steroid biosynthesis and activity. In all these aspects, mitochondria appear to play a crucial role.

Keywords: *Ecdysone, Insulin signalling, PGC-1, Proteostasis, Pyruvate, Medicine*

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The relationship between demographic characteristics of reproductive age Filipino-Muslim women and their knowledge, attitude, and practices regarding family planning in Northern Mindanao: a cross-sectional

Alonsabe, Ma. Orpha V. , Mangondato-Lucman, Fatmah B., Diawatan, Ma. Melissa F.

Family planning is a critical component of maternal and child health. It ensures proper spacing of children as well as having a target desired number of children. This study aimed to determine the knowledge, attitude and practices on Family Planning among reproductive age Filipino-Muslim Women. It was conducted in tertiary hospital in Northern Mindanao at the Out-Patient Department. Demographic and study data were gathered through a validated questionnaire. Results showed that most Filipino-Muslim Women coming in for prenatal checkup were in their late twenties (28.3%), unemployed, and already with 2 to 4 pregnancies. Associations were tested using Chi Square and significant correlations between patients' demographic characteristics and their knowledge, attitude, and practices regarding family planning. The study concludes that there is an association between patients' age and educational status, and their knowledge, attitudes, and practices regarding family planning. Further studies can be done to establish causation between risk factors and outcomes regarding family planning. A scoring system may be developed in the future classifying mothers as likely or unlikely to practice good family planning, which will allow for targeted family planning counseling.

Keywords: *Family Planning, Maternal Health, Religious Beliefs, Medicine*

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NP

Reproductive outcome of FIGO stage IA and IC ovarian cancer after fertility-sparing surgery: a retrospective cohort study

Cole, Lilli May T. , Santos, Ronaldo Antonio R. , Agulto-Mercadal, Marivic C.

Early stage ovarian cancer may be managed with fertility-sparing surgery, to preserve the uterus and contralateral ovary, thus preserving future reproductive function. The aim of this study was to determine the reproductive outcome of early stage ovarian cancer managed conservatively by unilateral salpingo-oophorectomy, and to compare the survival and recurrence rate among those who had and did not have pregnancy after treatment. A retrospective cohort study was conducted on 34 patients with early stage ovarian cancer who underwent fertility-sparing surgery from January 2005 to December 2018. Fertility outcome following treatment was determined. Survival and recurrence rate was analyzed between those who had and did not have pregnancy after surgery. A total of 34 out of 661 (5.14%) new cases of ovarian cancer who underwent fertility-sparing surgery were analyzed, with a mean age of 23.71 ± 5.57 years (range: 12-36 years old), with the most common complaints of increasing abdominal girth (11/34, 32.35%) or palpable abdominal mass (11/34, 32.35%). Successful pregnancy was seen in 9 cases (26.47%), with 2 of them currently pregnant. Overall recurrence and survival rates were 14.71% and 91.18%, respectively. There was no statistically significant difference in the survival rate (88.89% vs 92%, p-value 0.7778) and rate of recurrence (22.22% and 12%, p-value 0.4578) between those who got pregnant after fertility-sparing surgery for early stage ovarian cancer, FIGO Stage IA and IC, compared to those who did not get pregnant. Fertility-sparing surgery can be effectively offered to young patients with early stage ovarian cancer, to preserve reproductive function, with 26.47% successful pregnancy rate. Pregnancy had no significant effect on recurrence and survival among FIGO stage IA and IC ovarian cancer who underwent fertility-sparing surgery by unilateral salpingo-oophorectomy.

Keywords: *Early-stage ovarian cancer, Fertility-sparing surgery, Fertility outcome, Medicine*

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A retrospective analysis on treatment and survival outcome of locally advanced cervical cancer with or without brachytherapy: a single institution study

Abrenica, Joan Kristel B., Amparo, Genalin F.

Concurrent chemoradiotherapy composed of pelvic external beam radiotherapy (PEBRT) with weekly chemotherapy plus intracavitary brachytherapy (ICBT) remains to be the treatment of choice for locally advanced cervical cancer (LACC). However, some patients are not suitable to have ICBT right after pelvic radiation. Locally, active chemotherapy is being given to these patients until they can undergo the procedure. The aim of the study was to determine the impact of ICBT in the treatment and survival outcomes of cervical cancer and to compare it with active chemotherapy. This was a retrospective study of patients with LACC treated with or without brachytherapy in a single institution from January 2002 to December 2017. The 5-year over-all survival (OS) and 5-year recurrence free survival (RFS) of patients with ICBT were both significantly improved compared to those without ICBT ($p=0.001$ and $p=0.038$), respectively. Factors that were significantly correlated with adequate response for brachytherapy were non-squamous cell histology (OR 0.65, CI 0.46-0.92, $p=0.016$), initial tumor size of $> 5\text{cm}$ (OR 0.41, CI 0.26-0.65, $p=0.001$), $> 50\%$ decrease in the original tumor size at the middle part of PEBRT (OR 1.83, CI 1.2-2.8, $p=0.005$), > 3 cycles of chemotherapy as radiosensitizers (OR 2.66, CI 1.79-3.9, $p=0.001$), > 45 days duration of PEBRT (OR 0.63, CI 0.41-0.97, $p=0.04$) and > 2 episodes of anemia during PEBRT (OR 0.67, CI 0.52-0.85, $p=0.001$). Brachytherapy offers significant improvement on tumor control and over-all survival for patients with LACC. Active chemotherapy may offer some benefit in terms of delaying tumor recurrence or progression. However, this did not translate to survival impact if the patient was not able to have brachytherapy at all.

Keywords: *Active chemotherapy, Brachytherapy, Locally advanced cervical cancer, Medicine*

A retrospective study on the accuracy of sassone, lerner and IOTA simple rules in determining malignancy of ovarian masses in a tertiary hospital ob-gyn ultrasound diagnostics unit

San Juan, Filomena S. , Morales, Arriane R.

Ultrasonography has been established as one of the important diagnostic tools in detecting and classifying ovarian masses. Several studies have been made in determining the sensitivity and specificity of the different scoring systems as to determining the malignancy of ovarian masses. In a tertiary hospital ultrasound diagnostic unit, three scoring systems are utilized namely Lerner, Sassone and IOTA simple rules. To determine and compare the sensitivity and specificity on the most utilized ultrasound scoring systems in determining malignancy of ovarian masses. A single center observational, analytical, cross-sectional study utilizing review of the transvaginal or pelvic ultrasound results of women with ovarian masses that were scored using Sassone, Lerner and IOTA Simple Rules in a tertiary hospital ultrasound diagnostics unit from January 2013 to June 2016 was done. The sensitivity, specificity, positive and negative predictive values of each scoring system utilized was determined and compared with the histopathologic result. Out of the 111 ovarian masses that were included in the study, 44 ovarian masses were scored using Lerner Scoring system with a sensitivity, specificity, positive and negative predictive values of 100%, 65% 22.2% and 100%. 105 ovarian masses screened using Sassone Scoring System showed a sensitivity, specificity, positive and negative predictive values of 100%, 68%, 20.5% and 100%. A total of 33 out of the 111 ovarian masses were scored using the IOTA scoring system with a sensitivity, specificity, positive and negative predictive values of 100%, 85.6%, 55.5% and 100%. IOTA simple rules had a high sensitivity and specificity compared to Sassone or Lerner Scoring System. However, we cannot fully conclude that individual specificity will be better than combined tests since there is limited number of ovarian masses analyzed.

Keywords: *Malignancy, Ovary, Ultrasonography, Sensitivity, Specificity, Medicine*

A review on prevention of sticking during fluidized bed reduction of fine iron ore

Guo, Lei , Bao, Qipeng , Gao, Jintao , Zhu, Qingshan , Guo, Zhancheng

The fluidized bed ironmaking technology has attracted the attention of many researchers for decades as a direct reduction ironmaking method with many advantages. This process has been applied as a pretreatment method in many non-blast furnace ironmaking processes. However, the sticking problem hindered its development greatly. Defining the essential cause of sticking, and fundamentally solving this problem are the key steps encountered by this process. The research works related to the prevention of sticking problem during fluidized bed reduction of fine iron ore are comprehensively summarized in this article. The causes of sticking, the influencing factors of sticking and the solution of sticking are firstly discussed, followed by the analysis on the possible development direction of future fluidized bed ironmaking technology.

Keywords: *Fluidized bed, Fine iron ore, Sticking, Agglomeration, Iron whisker, Medicine*

Rifampicin-induced thrombocytopenia: a case report

Orcasitas, Jessie F. , Ang, Maria Carmen D. , Abdurahman, Heide P. , De Los Reyes, Denice C.

The worldwide prevalence of adverse drug reactions (ADR) to anti-TB medication ranges from 8% to 85%. Major adverse reactions include hepatic, renal, and hematologic disorders of which, Rifampicin-induced thrombocytopenia is one of these rare complications. A 58-year-old Filipino male developed respiratory and gastrointestinal bleeding with a severe drop in platelet count after several days of anti-tuberculosis (anti-TB) medications. The patient had oral mucosal petechiae, blood-streaked sputum, and epistaxis. The symptoms progressed to the formation of small adherent clots beneath the tongue, gum bleeding, melena, massive epistaxis, and hemoptysis with continued intake of the anti-TB drugs. The patient had anemia, normal WBC and differential count, and thrombocytopenia of $3 \times 10^3/\mu\text{L}$, a drop from $235 \times 10^3/\mu\text{L}$ five days prior. The bleeding resolved with the discontinuation of the drugs. A slow graded oral challenge to each of the drugs was done to identify the culprit medication. There was a recurrence of bleeding and a decrease in the platelet count after administration of rifampicin. The anti-TB medications were modified not to include rifampicin. The patient was discharged with no signs of bleeding and a normal complete blood count. TB is a prevalent disease in our country, and its medications can cause adverse drug reactions. Rifampicin-induced thrombocytopenia is a rare and life-threatening condition that physicians must be aware of and able to recognize promptly and treat properly to prevent recurrence of similar cases in the future. The patient should be forewarned not to take rifampicin and any fixed-dose combination drugs containing rifampicin.

Keywords: *Rifampicin, Thrombocytopenia, Platelet, Tuberculosis, Medicine*

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NP

The role of male partner perceptions in the intention to pursue contraception of teenage female adolescents with previous pregnancy experience: A cross sectional multi-setting survey: a cross sectional multi-setting survey

Tuquero, Janette P. , Mauricio, Maricel D.

There is a dearth of studies that explore the perceptions of male partners of adolescent females towards the intention of pursuing contraception. To determine the role of male partner perceptions in the intention to use of contraception among female adolescents to prevent unplanned repeat pregnancies. An urban sample of 102 male partners of female adolescents with previous pregnancy experience coming from the out-patient department and selected barangay health center responded to a two-part questionnaire that explored their perceptions towards contraception. Demographic data and their positive and negative views, attitudes and actual practice of contraception as it affects future intention to engage in family planning methods were determined. Male sexual partners have positive perceptions towards contraception. Despite this, utilization rate was still low (56.8%). Positively correlated with contraceptive intention include the male partner's advanced age and high level of education. Perceptions that favor strong intention include careful pregnancy planning in the future, not wanting a pregnancy too soon, knowledge of a specific method, its perceived benefits, "shared decision" making, feeling "happy" when contraceptives are offered rather than forced and when a woman lacks trust in him. Forcing contraception by the female adolescent partner was negatively correlated with contraceptive intention. Shared decision making towards contraception in order to reduce unintended pregnancies should engage the male partner's participation by correcting prevailing misperceptions.

Keywords: *Adolescent pregnancy, Contraception, Male partner, Perception, Medicine*

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2016 March,
(Filipiniana Analytics)
NP

0578

The role of sonography in the diagnosis of chronic puerperal uterine inversion: a case report

Reforma, Kareen N. , Figueras, Isabelle Julie A.

Chronic puerperal uterine inversion is a rare and life-threatening obstetric emergency which requires emergent treatment. We present a case of a 27-year-old Gravida 2 Para 2 (2002) with chronic uterine inversion. A bleeding, 4 x 4 x 5 cm fleshy knob like mass protruding from the cervix, was seen during vaginal inspection. Two-dimensional transvaginal sonography and 3-dimensional imaging clinched the diagnosis of uterine inversion. The patient underwent Haultain's procedure and was discharged improved with resumption of normal menses. Postpartum transvaginal sonography revealed a normally positioned uterus.

Keywords: *Chronic puerperal uterine inversion, Haultain's procedure, Sonography, Medicine*

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0579

Role of the N-terminus in human 4-hydroxyphenylpyruvate dioxygenase activity

Feng, An-Ning , Huang, Chih-Wei , Lin, Chi-Huei , Chang, Yung-Lung , Ni, Meng-Yuan , Lee, Hwei-Jen

4-Hydroxyphenylpyruvate dioxygenase (HPPD) is a key enzyme in tyrosine catabolism, catalysing the oxidation of 4-hydroxyphenylpyruvate to homogentisate. Genetic deficiency of this enzyme causes type III tyrosinaemia. The enzyme comprises two barrel-shaped domains formed by the N- and C-termini, with the active site located in the C-terminus. This study investigated the role of the N-terminus, located at the domain interface, in HPPD activity. We observed that the k_{cat}/K_m decreased ~8-fold compared with wild type upon removal of the 12 N-terminal residues ($\Delta R13$). Interestingly, the wild-type level of activity was retained in a mutant missing the 17 N-terminal residues, with a k_{cat}/K_m 11-fold higher than that of the $\Delta R13$ mutant; however, the structural stability of this mutant was lower than that of wild type. A 2-fold decrease in catalytic efficiency was observed for the K10A and E12A mutants, indicating synergism between these residues in the enzyme catalytic function. A molecular dynamics simulation showed large RMS fluctuations in $\Delta R13$ suggesting that conformational flexibility at the domain interface leads to lower activity in this mutant. These results demonstrate that the N-terminus maintains the stability of the domain interface to allow for catalysis at the active site of HPPD.

Keywords: *4-hydroxyphenylpyruvate dioxygenase, Molecular dynamics simulation, N-terminal segment, Truncated mutation, Tyrosine catabolism, Medicine*

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Roles of GPRC5 family proteins: focusing on GPRC5B and lipid-mediated signalling

Hirabayashi, Yoshio , Kim, Yeon-Jeong

In the past decade, physiological roles and molecular functions of GPRC5 family receptors, originally identified as retinoic acid-induced gene products, have been uncovered, even though their intrinsic agonists are still a mystery. They are differentially distributed in certain tissues and cells in the body suggesting that cell-type-specific regulations and functions are significant. Molecular biological approaches and knockout mouse studies reveal that GPRC5 family proteins have pivotal roles in cancer progression and control of metabolic homeostasis pathways. Remarkably, GPRC5B-mediated tyrosine-phosphorylation signalling cascades play a critical role in development of obesity and insulin resistance through dynamic sphingolipid metabolism.

Keywords: *Ceramide, Diacylglycerol, GPRC5B, Insulin resistance, Sphingomyelin, Medicine*

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Salivary ferning as an alternative to sonographic follicle monitoring for determining ovulation: A comparative study

Dee, Marlyn T. , Magno, Belmar T.

To determine if salivary ferning correlates significantly with sonographic indices in identifying the fertile period, and whether it may be used as a cheaper, and more convenient way to aid infertility patients in achieving pregnancy. Subjects who complain of difficulty achieving pregnancy and for whom follicle monitoring was indicated were recruited from the Outpatient Department in a tertiary hospital in Manila. Patients (n=40) with Primary or Secondary Infertility from April 2013 to August 2015 who require serial follicle monitoring as part of infertility work up were recruited in the study. For every follicle monitoring by ultrasound done by one sonologist, a salivary sample was obtained from the subject and the ferning pattern was determined and recorded by one pathologist blinded as to the day of the subject's menstrual cycle. There was a total of 40 subjects who underwent 2 serial follicle monitoring during the study. The 1st TVS (preovulatory) was done between Day 9 to 14 of the cycle with an average of Day 11. Correspondingly, salivary ferning done showed that there were 26 (65.0%) with Salivary Ferning 1 pattern and 14 (35.0%) with Salivary Ferning 2 pattern (p=0.35). This showed no significant difference between follicle monitoring and salivary ferning pattern and either may be used in identifying fertile period preovulatory. The 2nd TVS (postovulatory) was done between Day 12 to 21 with an average of Day 16. All the second ultrasound findings showed signs of ovulation. Correspondingly, there were 1 (2.0%) showed Salivary Ferning 1 pattern, 11 (27.5%) showed Salivary Ferning 2 Pattern and 28 (70.0%) showed Salivary Ferning 3 Pattern 9 (p=0.05). This showed no significant difference between follicle monitoring and salivary ferning pattern, hence, TVS follicle monitoring remains more reliable in identifying that ovulation has occurred. Salivary ferning corresponded well with ultrasonographic findings during the preovulatory phase of the cycle, while no correlation was noted between the salivary ferning pattern and the postovulatory phase of the cycle. Hence, sonographic follicle monitoring remains a better predictor of ovulation, and more effective in identifying the fertile period.

Keywords: *Follicle monitoring, Infertility, Salivary ferning, Medicine*

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Secondary renal amyloidosis in rheumatoid arthritis patient

Bandiara, Ria , Hamijoyo, Laniyati , Usman, Stefanie Yuliana , Darmawan, Guntur , Sukesi,

Rheumatoid arthritis (RA) is one of systemic chronic progressive inflammatory disorders based on immunological disharmonies. Poorly controlled systemic inflammation in RA often leads to renal diseases such as secondary amyloidosis. A 30-year-old man complained of swelling and tenderness of multiple joints gradually worsened the past 7 years. His laboratory examination showed anemia, positive rheumatoid factor (RF) and anti-citrullinated protein antibody (ACPA). C-reactive protein (CRP) was 48.7 mg/L (Normal value is <5 mg/L), increase in serum creatinine and protein was +3 in urine. His estimated glomerular filtration rate (e-GFR) was 58.3 mL/min/1.73 m². Radiologic examinations of joints revealed features that support the diagnosis of rheumatoid arthritis. Renal biopsy was done revealed amyloid deposit. He was diagnosed with rheumatoid arthritis and secondary renal amyloidosis. Early proper diagnosis of RA is important and immunosuppressive drugs might slow disease progression by controlling the inflammatory process. We discussed the importance of early diagnosis and the use of better treatment in managing RA to prevent renal amyloidosis.

Keywords: *Rheumatoid arthritis, Renal amyloidosis, Early diagnosis, Medicine*

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2021 January to March,
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NP

Second-day sequential organ failure assessment (SOFA) score as predictor in 30-day hospital mortality among Filipino adult patients who presented with sepsis at the emergency department

Tibayan, Christopher John N., Alcala, Ferdinand G.

The Third International Consensus Definitions for Sepsis and Septic Shock in 2016 promoted the new definition and prognostication scheme among patients with sepsis using the Sequential Organ Failure Assessment (SOFA) scoring system. This study determined the discriminative power of the second-day SOFA scoring system in predicting 30-day hospital mortality among adult Filipino patients who presented with sepsis in a tertiary government hospital in the urban setting in the Philippines. We evaluated 107 adult with sepsis presenting at the emergency department from June 1, 2017 to August 31, 2017 in a 300 bed capacity tertiary hospital. Receiving operating characteristic curves were generated to determine optimal cut off scores of the SOFA scoring system in predicting 30-day mortality. Binary logistic regression was performed to determine the association of the SOFA derivatives with hospital mortality. STATA 15 was used for data analysis. Second-day SOFA scores had excellent predictive ability for 30-day mortality at a cutoff point of 5, with sensitivity and specificity at 84.21% and 84.81%, respectively as compared with other SOFA derivatives at a given point in time. The utility of second-day SOFA Score at a lower cut off score of five, has a good discriminative power in predicting the all cause mortality among adult septic patients. This lower cut off score indicated a lower threshold trigger in identifying patients needing more intensive monitoring given the association of higher mortality risk in comparison with other studies done abroad.

Keywords: *Sequential organ failure assessment, SOFA, Sepsis, Mortality, Philippines, Medicine*

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NP

Severe keratoderma blenorrhagicum simulating psoriasis in reactive arthritis: a case report

Bayson, Richelle Joy D., Navarra, Sandra V.

Severe keratoderma blenorrhagicum (KB) is a rare cutaneous manifestation of reactive arthritis (ReA) which can be indistinguishable from psoriasis, making the diagnosis challenging. This is a case of reactive arthritis in a 33-year-old female presenting with disabling, painful oligoarthritis which was accompanied by generalized pustular and scaly rashes simulating psoriasis. A 33-year-old female, Filipino, single with no known co-morbidities presented with disabling, painful oligoarthritis which was accompanied by generalized pustular and scaly rashes of two weeks duration. Her symptoms were preceded a few days earlier with a transient episode of conjunctivitis. She also reported having recently received treatment for “urinary tract infection”. There were generalized hyperkeratotic papules with areas of desquamation overlying erythematous skin involving the scalp, hairline, trunk, and extremities including palms and soles, with onycholysis on all digits. The right wrist and both ankles were warm, swollen and tender, with dactylitis involving most toes. Dermatology consult concurred with the diagnosis of keratoderma blenorrhagicum associated with reactive arthritis, over psoriasis or psoriatic arthritis, and she was started on prednisone 60 mg/day; methotrexate (MTX) 20 mg/week and folic acid were added a week later. With dramatic resolution of both skin and joint involvement, prednisone was tapered to 10 mg/day over the next three weeks and MTX was maintained at 15 mg/week, with no rebound nor recurrence of symptoms. Severe KB is a rare cutaneous manifestation of ReA which can be indistinguishable from psoriasis. The acute onset of symptoms, recent history of eye inflammation and genitourinary tract infection strongly favored ReA over psoriasis. A further hallmark of KB is the presence of sterile pustules on the palms and soles. Histologically, KB has more numerous pustules and massive hyperkeratosis compared to psoriasis. Moreover, the dramatic response to systemic steroids, without rebound nor recurrence upon steroid taper or discontinuation favors KB over psoriasis.

Keywords: *Reactive arthritis, Severe keratoderma blenorrhagicum, Case report, Medicine*

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(Filipiniana Analytics)
NP

Severe malaria in a pregnant woman successfully treated with artemisinin-based combination therapy (ACT)

Du, Angela A. , Aquino, Stephanie Marie S.

Malaria is suspected in pregnant women with fever of unknown origin who come from areas with high transmission of the disease. Pregnant women are at greater risk of infection due to a weakened immune response and higher parasite burden because of placental sequestration. A 26-year-old Sudanese primigravid 23 6/7 weeks of gestation presented at our institution with mixed infection of malaria, with severe features (hypotension and anemia). Malaria was highly suspected due to her country of origin, which was highly endemic and has high transmission of the disease. Fetal surveillance to monitor fetal well-being was done since malaria is known to cause perinatal adverse outcomes. Intrauterine growth restriction, preterm labor and stillbirth are the most common perinatal morbidity from malaria. These are not present in the patient due to the prompt initiation of artemisinin-based combination therapy, which significantly decreased the parasite load, leading to successful outcome.

Keywords: *Malaria, Malaria in Pregnancy, Artemisinin combination therapy, Medicine*

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(Filipiniana Analytics)

Sheehan's syndrome in a patient presenting with organizing hematoma of the maxillary sinus

Matibag, Viktoria Ines P., Crisologo, Ma. Cristina

Sheehan's syndrome is a rare complication of post-partum hemorrhage that has decreased in incidence in the past decade due to better obstetrical practices, although still seen in developing countries. This is a case of a 31-year-old Gravida 1 Para 1 (1-0-0-0) with a 1-year history of enlarging maxillary sinus mass, where an incidental finding of an empty sella in an MRI with contrast was noted. The patient had amenorrhea of 15 years and received no medications for her undiagnosed Sheehan's syndrome incurred during her first and only pregnancy. The patient's cardiomyopathy and organizing hematoma may be rare complications of Sheehan's syndrome. Patients, laymen, health practitioners, and traditional birth attendants should be informed of these complications. Treatment should be individualized and administered after diagnosing a patient with Sheehan's syndrome to prevent complications such as adrenal insufficiency, hypothyroidism, infertility, and seen in this case, acute heart failure and possibly organizing hematoma.

Keywords: *Sheehans syndrome, Post-partum hemorrhage, Oraganizing hematoma, Dilated cardiomyopathy, Medicine*

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2019 September to October,
(Filipiniana Analytics)
NP

Single loading dose versus standard 24-hour magnesium sulfate in women with severe preeclampsia and eclampsia: a systematic review and meta-analysis

Salvador, Floriza Crisostomo , Salvador, Dirdrah Aina Crisostomo

The primary goal of this study is to determine if a single loading dose of Magnesium sulfate (MgSO_4) is comparable to standard 24-hour therapy in preventing seizures with severe preeclampsia and eclampsia. Meta-analysis and Systematic review of six randomized controlled trials. Patients diagnosed with severe preeclampsia and eclampsia. Giving of single loading dose only (study group) versus 24-hour MgSO_4 therapy (control) in patients with severe preeclampsia and eclampsia. (1) Anti-convulsant effects (2) Maternal: loss of deep tendon reflex and oliguria, incidences of caesarean section, Hemolysis, elevated liver enzymes, low platelet (HELLP) syndrome, post partum hemorrhage and intensive care unit admissions and (3) Neonatal complications: incidences of neonatal intensive care unit (NICU) admission, APGAR score at 5 minutes and death. Occurrence of seizures was similar in both groups. The risk difference of -0.00 (95% Confidence interval (CI): -0.04 to 0.03; $p=0.84$) showed no significant difference and the combined studies were found to be homogenous with an I^2 of 0.0. A single loading dose of MgSO_4 is comparable in preventing seizures of preeclamptic and eclamptic patients with similar maternal and neonatal complications except for a lesser occurrence of decreased patellar reflex in the study group ($p<0.000001$).

Keywords: *Preeclampsia, Eclampsia, Single Loading Dose, 24-hour regimen, Medicine*

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NP

Small cell carcinoma arising from a mature cystic teratoma of the ovary: a case report

Rico-Josue, Ronora Grace, Soriano, Yvonne T.

Malignant transformation of a mature cystic teratoma (MCT) or dermoid cyst in the ovary occurs only 1 to 2% of cases of MCTs. Only 6 cases of small cell carcinoma arising from a MCT have been reported. The patient is a 36 year-old G2P2(2002) who presented with an enlarging abdominal mass and right lower quadrant pain. She was diagnosed with a dermoid cyst four years prior to admission, but no surgical intervention was done. On admission, ultrasound revealed multiple pelvo-abdominal masses consistent with dermoid cysts. The patient underwent total abdominal hysterectomy with bilateral salpingo-oophorectomy, peritoneal fluid cytology, bilateral pelvic lymph node dissection, excision of enlarged paraaortic lymph nodes and infracolic omentectomy. Histopathology revealed a small cell carcinoma arising from a MCT in the left ovary consistent with a Stage IIIA1ii tumor. She underwent chemotherapy with 4 cycles of Etoposide-Cisplatin and has no evidence of disease 3 months after treatment.

Keywords: *Dermoid cyst, Mature cystic teratoma, Ovary, Small cell carcinoma, Medicine*

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NP

Not so young at heart: a case report of acute myocardial infarction in a 23-year-old young adult

Cuenza, Lucky, Yap, Emily Mae, Andres, Mark Donn D.

Acute myocardial infarction (AMI) among young people is relatively uncommon. The protection offered by a young age has been slowly taken away by the increased prevalence of risk factors for CHD in adolescents such as smoking, obesity, and lack of physical activity. This is a case of a 23-year-old male smoker with no known comorbid and heredofamilial diseases who was admitted due to sudden onset of severe, stabbing, substernal chest pain. ECG was done which showed sinus rhythm with some premature ventricular depolarizations occurring in bigeminy, and ST elevation on V4-V6, I and AVL with reciprocal ST depression on III, AVF (Fig 2) consistent with extensive anterior wall myocardial infarction. Troponin I was elevated (7.57 ng/ml). Coronary angiography was done revealing a luminal filling defect at the distal segment of the left main artery consistent with thrombus formation. The patient underwent percutaneous coronary intervention of the left main artery and left anterior descending artery with TIMI III flow after the procedure. He was then discharged improved and was advised to take his home medications with good compliance. MI in younger patients does carry a better prognosis if appropriately treated to be taken into consideration when treating these young adults presenting with MI. Emphasis on the importance of secondary preventive measures should be noted.

Keywords: *Acute myocardial infarction, Case report, Coronary angiography, Percutaneous coronary intervention, Risk factors, Medicine*

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NP

Sonographic features and clinical correlates of correctly positioned and malpositioned intrauterine device in women examined at a tertiary hospital: a five year review

Panlilio-Vitriolo, Regina Rosario M., Kamensa, Nur Ainee

Transvaginal ultrasound prior to IUD insertion may be helpful in appropriate patient selection and optimal patient conditions in preventing IUD malpositions and complications. To describe the sonographic features of correctly positioned and malpositioned intrauterine device (IUD) in women and correlate with associated symptoms and concurrent cervical, uterine and ovarian pathology. This is a 5-year retrospective cross-sectional study. Patients in a tertiary hospital with sonographically detected correctly positioned and malpositioned IUDs were selected from the Obstetrics and Gynecology Ultrasound Database from January 1, 2014 to December 31, 2018. The patient's name and case number were used to review the patient's charts for the demographic profile and other necessary data. Intrauterine device sonographic features were recorded, correlated clinically and analyzed statistically. Three hundred two patients were eligible for the study with ages between 41 to 50 years old and with an average of 1 to 3 pregnancies and livebirths. Almost half of the women with malpositioned IUDs complained of missing IUD string. Sonographically, the IUD appeared echogenic with more than half demonstrating a linear echogenic stripe. The most common type of malpositioned IUD was partial or fully embedding the myometrium (45.2 %), followed by those located in the cervix or in the lower uterine segment (35.7%), partially expelled with IUD segment extending through the external cervical os (11.9%), and fragmented (4.7%). The least common malpositioning was malrotation of the IUD (2.3%). There were significantly more women with cervical disease among those who had correctly placed IUDs. Thirteen women were pregnant, 9 of whom had intrauterine pregnancies. 3 had ectopic pregnancies and 1 had an abortion. Eight of the 9 intrauterine pregnancies had malpositioned IUD and only 1 had correctly positioned IUD which was statistically significant. Women with IUD who became pregnant and with missing IUD strings are important predictors to re-assess IUD placement. Uterine pathologies such as myomas and adenomyomas do not affect placement of intrauterine devices. IUDs remain in place in the presence of cervical diseases such as cervical malignancies.

Keywords: *Two dimensional (2D) ultrasound, Intrauterine device, Correctly positioned IUD, Malpositioned/displaced IUD, Medicine*

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NP

Spleen factor: the spleen's role as a respiratory organ

Sandoval, Mark Anthony S. , Valenzuela, Rafael Lorenzo G., Jorge, Manuel C.

The Bajaus' ability to free dive for prolonged periods is attributed to their exceptional physiologic response and large spleens. The spleen has been traditionally viewed as a hematologic and immunologic organ. Unconventionally, this review explores the spleen's role as a respiratory organ and how apnea training can enhance the spleen's form and function. Eligible articles obtained from *Pubmed* were discussed. The selected studies have shown that an 8-week home-based apnea training regimen can enhance the spleen volume by as much as 24% and that prolonged apnea training can increase both splenic contraction and baseline serum hemoglobin levels. However, the sample size and heterogeneity of these studies largely limit the generalizability of these findings. Thus, several future studies are needed to further explore the spleen's respiratory function in humans.

Keywords: *Spleen, Divers, Apnea training, Medicine*

Philippine Journal of Internal Medicine, Volume No. 59 Issue No. 1, 1-6
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(Filipiniana Analytics)
NP

Spontaneous uterine rupture secondary to pyometra in a cervical cancer patient: a case report

Cenizal, Maria Concepcion D., Aquilizan, Leo Francis

Pyometra, an accumulation of pus within the uterine cavity, is a rare gynecologic disease with an incidence of 0.01-0.5% among all gynecologic patients and 13.6% among elderly gynecologic patients. Pyometra in itself is rare, much so is uterine rupture occurring secondary to it. No local data reporting incidence of ruptured pyometra in the Philippines has been published. This is a case of a 63-year-old Gravida 5 Para 5 (5-0-0-4), with Cervical Endometrioid Adenocarcinoma Stage IIIB, presented with abdominal pain. Whole abdominal Computed Tomography scan revealed pneumoperitoneum. Initial assessment was pneumoperitoneum probably secondary to ruptured viscus. The patient underwent exploratory laparotomy which revealed ruptured pyometra. Subsequent management included drainage, culture guided antibiotics, radiotherapy and brachytherapy. Spontaneous rupture of pyometra is a serious medical condition which requires an accurate diagnosis in order to arrive in appropriate surgical and medical management. However, pre-operative diagnosis is difficult despite the presence of advanced imaging techniques, hence high level of suspicion is warranted in identifying this condition.

Keywords: *Uterine rupture, Ruptured pyometra, Cervical carcinoma, Medicine*

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(Filipiniana Analytics)
NP

Squamous cell carcinoma of the cervix with cranial metastasis: a case report

Toral, Jean Anne B. , Tanchuling, Maria Patricia Angelica M.

Squamous cell carcinoma is the most common female genital tract malignancy that typically spreads to the pelvic organs first by direct extension, and less commonly to distant sites through lymphangitic and hematogeneous spread. We report on a 47-year-old woman diagnosed with squamous cell carcinoma who underwent concurrent chemoradiation, presenting with a fronto-parietal scalp mass which on histopathologic examination also shows squamous cell carcinoma, likely metastatic.

Keywords: *Cervical cancer, Cranial metastasis, Scalp metastasis, Medicine*

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NP

Structure of HIRAN domain of human HLTF bound to duplex DNA provides structural basis for DNA unwinding to initiate replication fork regression

Hishiki, Asami , Sato, Mamoru , Hashimoto, Hiroshi

Replication fork regression is a mechanism to rescue a stalled fork by various replication stresses, such as DNA lesions. Helicase-like transcription factor, a SNF2 translocase, plays a central role in the fork regression and its N-terminal domain, HIRAN (*HIP116* and *Rad5 N-terminal*), binds the 3'-hydroxy group of single-stranded DNA. Furthermore, HIRAN is supposed to bind double-stranded DNA (dsDNA) and involved in strand separation in the fork regression, whereas structural basis for mechanisms underlying dsDNA binding and strand separation by

HIRAN are still unclear. Here, we report the crystal structure of HIRAN bound to duplex DNA. The structure reveals that HIRAN binds the 3'-hydroxy group of DNA and unexpectedly unwinds three nucleobases of the duplex. Phe-142 is involved in the dsDNA binding and the strand separation. In addition, the structure unravels the mechanism underlying sequence-independent recognition for purine bases by HIRAN, where the N-glycosidic bond adopts syn conformation. Our findings indicate direct involvement of HIRAN in the fork regression by separating of the daughter strand from the parental template.

Keywords: *Crystal structure, DNA damage response, Protein–DNA interaction, Replication fork regression, Template switching, Medicine*

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2020 June,
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0595

A study of the knowledge, attitude and practices regarding menopause and its treatment among gynecologic oncology patients treated at the Philippine General Hospital

Amorin, Helen R., Luna, Jericho Thaddeus P.

Menopause is a normal and natural event. It is defined as the final menstrual period and is usually confirmed when a woman has missed her periods for 12 consecutive months. Dealing with issues regarding menopause is just as important in the care of patients afflicted with cancer as it is to the general population undergoing this singular experience. By knowing the patients' knowledge, attitudes, and practices (KAP) regarding menopause and its treatment, both patients and health care providers will be given a better perspective and useful insights on the matter which, hopefully, will translate to an improved and more holistic patient care. To determine the knowledge, attitudes, and practices regarding menopause of gynecologic oncology patients treated at the Philippine General Hospital (PGH). This was a prospective study which employed a KAP survey on menopause using a structured questionnaire designed by the author. The questionnaire was patterned after the Menopause Health Questionnaire of the North American Menopause Society (NAMS) and the Menopause Rating Scale (MRS). Descriptive statistics were employed in the analysis of data using frequency and percentages. There was a total of 100 respondents of the KAP survey conducted at the PGH Cancer Institute Section of Gynecologic Oncology Outpatient Clinic. Majority of the respondents were aware of the more common symptoms of menopause such as irritability (61%) and hot flushes (49%) but had limited knowledge regarding the other symptoms. Majority are not aware of the different treatment modalities available to address menopausal symptoms. Only 13% of the respondents knew about hormonal replacement therapy as a treatment option for menopause. Only a small proportion of the respondents were familiar with the different forms of complementary and alternative medicine. Most of the respondents viewed menopause as a natural event in a woman's life and needs no treatment. Majority of the gynecologic oncology patients included in the survey do not know about the symptoms of menopause and the treatment options available to address these symptoms. An overwhelming majority of the women included in this survey consider menopause as a normal part of a woman's life and view menopause in a positive light. Most of the respondents also do not feel that it is a condition that warrants treatment. Although they also experienced some of the symptoms of menopause, majority of the respondents did not avail of any treatment.

Keywords: *Knowledge, Attitude, Practice, Menopause, Gynecologic oncology, Medicine*

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NP

A study on the factors affecting the use of the POGS-Nationwide Statistics System (PNSS) among Philippine Obstetrical and Gynecological Society (POGS)-accredited institutions in 2016

Domingo, Ayedee Ace M. , Toral, Jean Anne B. , Añonuevo, Antoinette U. , Sun-Cua, Alice M. , Habana, Maria Antonia E. , Te-Santos, Helen Grace

To evaluate the factors affecting the use of the POGS PNSS across institutions. A cross-sectional study was done by the POGS Committee on Nationwide Statistics from November 2017 to April 2018. Eight representative institutions were chosen from POGS accredited institutions for service and training from the NCR, Luzon, Visayas, and Mindanao, based on the classifications of I. Complete Data, II. Incomplete Data, III. Wrong Format, and IV. No Data. Hospitals with the most number of admissions under each category were chosen. Interviews with chairpersons of the departments, Focus Group Discussions (FGD) with the OB-GYN residents, and actual direct observations of how data were encoded in the PNSS were done. All the chairpersons and Ob-Gyn residents of the selected institutions were aware of the importance of the PNSS especially in generating vital nationwide statistics like Maternal Mortality and Morbidity Rates. They had several pertinent suggestions on how improvement of the PNSS, like harmonization of classification of diseases with PHIC and ICD codes, and to include other co-morbidities in the system. The factors affecting the use of POGS-PNSS in 2016 include: good attitude and compliance among POGS-accredited institutions, but there is a need to address multiple diagnosis including medical co-morbidities. Final diagnosis also needs to be PHIC-compliant, and there is a need to address the Data Privacy Act with the use of eMR (electronic medical records).

Keywords: *Nationwide Statistics, Medicine*

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NP

A study on the knowledge and management practices of hypertension in pregnancy among midwives in the different public health centers of Cebu City

Uyheng, Geraldine Isabella B. , Rodriguez-De Vera, Maria

The Millennium Development Goal (MDG) for 2015 has a target MMR of 52/100,000 live births but this goal has been difficult to achieve. In the Philippines, 11 mothers die everyday from pregnancy related complications, a bulk contributed by Hypertension. Public health midwives sometimes attend to these obstetrical emergencies often in the absence of a physician. This led to the BEmONC program, which addresses the rising morbidities from far-flung areas where resources are scarce, and helps train midwives in essential obstetrical emergency care. The midwives are our allies in providing the best standard of care every mother and child rightfully deserves. Only thru periodic evaluation can we help strengthen the BEmONC program, making it crucial to evaluate the midwives' knowledge and management practices in hypertension to help identify the setbacks that have impeded our progress in achieving the MDG. To assess the knowledge and management practices of midwives in the management of hypertension in pregnancy in accordance to the BEMONC protocol. This is a descriptive study where a survey questionnaire was used and convenience sampling was done. Chi square and Fischer exact tests were employed to compare proportions. Descriptive statistics was used to summarize the data in proportion. More than 70% of the midwives were knowledgeable regarding expected competencies, where BEmONC-trained midwives were 5-14x more likely to identify appropriate function. However, only a dismal 22-36% will actually administer Magnesium Sulfate, which shows that knowledge is not translated into practice. Also, more than 70% were knowledgeable on the risk factors and danger signs of hypertension. However, only less than 40% knowledge rate was demonstrated in the diagnosis and classification of hypertension in pregnancy. It also showed that midwives agreed to give antihypertensive medications- where Methyldopa was most commonly given. Among those who agreed to give Methyldopa, majority were BEmONC-trained. A number also agreed to give hydralazine and diazepam in the setting of severe preeclampsia and eclampsia, where more non-

BemONC midwives agreed. Alarming, only less than 50% will refer to a physician in the management of gestational hypertension and mild preeclampsia, and only 50-60% agreed to facilitate hospital transport in the setting of severe preeclampsia and eclampsia. The BemONC manual must be updated to keep up with current guidelines and ensure the conversion of knowledge into practice. The BemONC coverage of training must also be expanded so that all practicing midwives know the protocol. However, the DOH must further strengthen their role in the active surveillance of public health midwives and review the retention of their skills and regular practice of knowledge. Midwives must also be certified proficient, not merely trained. The midwives must also be consulted to explore their problems in the implementation of current guidelines so we can better understand their situation as to why knowledge is not put into practice. By identifying deficiencies, we can improve and address setbacks that have impeded our progress towards achieving the Millennium Development Goal.

Keywords: *BemONC, CPG, DOH, Hypertension in pregnancy, Knowledge, Practices, Public health midwives, Medicine*

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(Filipiniana Analytics)
NP

0598

A successful management of an advanced secondary abdominal pregnancy with a live fetus: a case report

Dela Cruz, Sheryl Ann B. , Tongco, Carmencita B. , Fernando, Katherine Mae

Advanced abdominal pregnancy is associated with catastrophic outcomes for both mother and fetus. Because it is rare, it is often misdiagnosed and the surgery, often unplanned, may end up with uncontrollable hemorrhage and injury to abdominal structures during placental removal. A case of a 21-year-old G1P0, 34 weeks gestation, who presented as a bleeding placenta previa but diagnosed intraoperatively as abdominal pregnancy with a live baby with congenital anomalies, with complete removal of the placenta and with good maternal outcome is presented. This report highlights the pitfalls in diagnosis and stresses the importance of team management, adherence to good surgical principles, and timely operative decisions to ensure a successful outcome when preoperative evaluation is not possible.

Keywords: *Advanced abdominal Pregnancy, Ectopic pregnancy, Live baby, Placental removal, Medicine*

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NP

0599

Successful management of uterine arteriovenous malformation by laparoscopic bilateral uterine artery ligation

Tan Cardoso, II, German C. , Nano, Nerissa Gracia G. , Matundan, Katherine R.

Arteriovenous Malformations are vascular disorders where there is an abnormal communication between an artery and vein. It can occur anywhere in the body not even sparing the uterus. Uterine Arteriovenous Malformations (AV Malformation) is a rare occurrence with less than 100 cases reported in literature. It can cause significant bleeding leading to anemia and even hypovolemic shock. It may be acquired from previous uterine manipulation such as dilatation and curettage and previous uterine surgeries. Diagnosis is made by angiography or doppler ultrasonography. Definitive treatment is hysterectomy however a less invasive, fertility preserving are uterine

vascular occlusion techniques, of which the treatment of choice is Uterine Artery Embolization (UAE). We present our experience with 24 year-old G2P2 (1101) with scarred uterus suffering from recurrent profuse vaginal bleeding suspected to have uterine arteriovenous malformation. Laparoscopic bilateral uterine artery ligation, an alternative, more economical, relatively safe and available treatment option was given to the patient.

Keywords: *Uterine arteriovenous malformation, Uterine artery embolization, Abnormal uterine bleeding, Medicine*

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2016 December,
(Filipiniana Analytics)
NP

0600

A successful pregnancy after two fertility-sparing surgeries for borderline ovarian tumor

Manabat, Manuel S. , Espino-Strebel, Elizabeth E. , Mendiola, Patricia Ann G.

Low malignant potential serous tumors are the most common subtypes of non-benign serous tumors in the young, usually confined to one or both ovaries. To preserve ovarian function and fertility conservative management can be performed. Although recurrence is higher than that after a completion surgery, the rate of recurrences continues to be debated. Most recurrent diseases are of the same histopathology as the initial tumor and adequate excision of the recurrent tumor can be done. A 31-year old, primigravid underwent bilateral oophorocystectomy for serous borderline ovarian tumor stage IB. After 3 years she had tumor recurrence and another fertility-sparing surgery consisting of left salpingo-oophorectomy and contralateral cystectomy was done. Histopathology was a recurrent borderline ovarian tumor. Two years later, she had a spontaneous pregnancy and delivered to a live term baby. This is a reported case of a successful pregnancy after two fertility-sparing surgeries for borderline ovarian tumor.

Keywords: *Borderline ovarian tumor, Low malignant potential, Fertility-sparing surgery, Conservative treatment, Pregnancy, Medicine*

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NP

0601

A successful pregnancy outcome in a case of maternal VACTERL

Concepcion, Dominique Joyce M., Pelaez-Crisologo, Ma. Cristina

Vertebral anomalies-anal atresia-cardiac abnormalities-tracheoesophageal fistula-renal agenesis-limb (VACTERL) defects association is a rare congenital disease. While most scientific literature focus on the clinical presentation and management of pediatric patients with this condition, this paper focuses on the challenges faced by a 22-year-old primigravid, who was able to carry a pregnancy to term, despite the many anomalies associated with being afflicted with VACTERL.

Keywords: *VACTERL, VACTERL association, VATER, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 42 Issue No. 2, 35-39
2018 March to April,
(Filipiniana Analytics)
NP

Survival analysis of patients with stage IB to IIA2 cervical cancer: a five-year single institution review

De Leon, Zelda Sue C., Cuenca, Benjamin D.

This study aims to determine the disease-free survival and overall survival outcome of patients with IB to IIA cervical cancer managed with surgery, chemoradiation, or a combination of both in a tertiary government training hospital. This is a retrospective study of patients diagnosed with stage IB-IIA2 cervical cancer from January 2013 to June 2017. Data were encoded using Microsoft Excel. Statistical analyses were computed using SPSS. Cox regression and Kaplan Meier analyses were used to predict survival outcomes. Out of 135 patients were included in the study, 111 received treatment. 61 had no evidence of disease. Median age is 46 years with stage IB1 disease. Majority of patients underwent surgery followed by adjuvant therapy. Tumor recurrence was highest in the surgery alone group, with median time to recurrence of 19 months. Median follow-up time was 10 months. Overall 5-year survival is 51.4%; 5-year disease-free survival is 54.8%. Age is a statistically significant factor in survival. Surgery with adjuvant chemotherapy + radiation had the most favorable survival outcome. Neoadjuvant treatment gave the least number of recurrences. Despite a small sample size, this study provides baseline data into the survival outcome of patients with locally advanced cervical cancer in our institution given the different treatment recommendations.

Keywords: *Cervical cancer, Early stage, Disease-free survival, Overall survival, Hysterectomy, Chemoradiation, Adjuvant chemotherapy, Neoadjuvant chemotherapy, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 2, 34-41
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(Filipiniana Analytics)
NP

Swyer syndrome: a case of primary amenorrhea in an 18-year-old with gonadal mixed germ cell tumor

Lazo, Hossanah Harriet M., Tongco, Carmencita B., Asuncion-Wong, Olga

An 18-year-old, G0, with primary amenorrhea consulting because of a rapidly enlarging abdominal mass was diagnosed with Swyer syndrome or 46 XY pure gonadal dysgenesis and subsequently underwent staging laparotomy for mixed germ cell tumor (dysgerminoma and yolk sac tumor) arising from her dysgenetic gonad. Bleomycin, etoposide, cisplatin regimen for three to four cycles was planned but the patient was lost to follow-up. A prompt evaluation of her amenorrhea and a timely gonadectomy could have averted the development of malignancy.

Keywords: *Amenorrhea, Gonadal dysgenesis, Swyer syndrome, Mixed germ cell tumor of ovary, Medicine*

Philippine Journal of Obstetrics and Gynecology, Volume No. 43 Issue No. 5, 34-38
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(Filipiniana Analytics)
NP

Tale of two: a 'case report' of two giant urinary bladder stones and recurrent anemia in a 78-year-old Filipino male

Jara, Raul D. , Quiambao, Antonio Lorenzo R. , Zacarias, Mary Claire H.

This is a rare case of two large urinary bladder stones causing severe infection of the urinary tract affecting the bone marrow due to chronic immune stimulation in a patient with recurrent anemia. Urinary bladder calculi are hard masses of minerals. They develop when the minerals in concentrated urine crystallize. This often happens when the bladder cannot be emptied. Signs and symptoms can vary from severe abdominal pain to blood in the urine. Sometimes, bladder stones don't cause any symptoms. If left untreated, bladder stones may lead to infections and other complications such as hepatic abscess via a hematogenous route. This is a case of a seventy-eight-year-old man with a history of multiple blood transfusions secondary to anemia of unknown cause. He came into our institution for a second opinion. We worked up the patient, which showed hepatic abscess and two large urinary bladder calculi. Further investigation of the anemia later led to a diagnosis of primary myelofibrosis. Ultrasound showed a complex mass on the left hepatic lobe measuring 7.5 cm x 6.0 cm x 2.1 cm consistent with a hepatic abscess. The culture of the abscess was positive for *E. coli*. Computed Tomography (CT) scan of the lower abdomen showed heterogeneous mass measuring 8.6 cm x 8.7 cm x 9.2 cm within the urinary bladder (see Figure 2). Urinalysis was consistent with a urinary tract infection. Urine culture showed *E. coli*. Video-assisted cystoscopy showed two urinary bladder calculi, measuring 1.5 cm x 3.2 cm x 4.2 cm weighing 30 grams each (see Figure 3). The calculi were composed of 100% Calcium Oxalate. He underwent a series of diagnostic examinations for anemia including gastroscopy to rule out a bleeding ulcer. Complete blood count showed hemoglobin of 77 g/L and a hematocrit of 0.23. Finally, bone marrow core biopsy was done which is consistent with primary myelofibrosis. Urinary bladder stones can be asymptomatic and may present only with vague abdominal pain. It should be one of the considerations in asymptomatic patients with long-standing prostatitis or benign prostatic hyperplasia. Detailed history, thorough physical examinations, and cautious diagnostic tests are mandatory to confirm the diagnosis. A hepatic abscess may arise from infections in the urinary tract such as prostatitis through hematogenous extension. Therefore, it is important to address the origin of the infection to prevent such complications. This is a rare case of an elderly man who presented with chronic anemia and later found out to have large urinary bladder stones that caused severe infection leading to immune stimulation of the bone marrow, hence the diagnosis of primary myelofibrosis by bone marrow biopsy. Such a rare case must be thought of holistically and analytically.

Keywords: *Anemia, Urinary bladder calculi, Hepatic abscess, Benign prostatic hyperplasia, Prostatitis, Medicine*

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2020 July to September,
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NP

Targeted sequencing of mixed neuroendocrine- non-neuroendocrine neoplasm of the gallbladder suggests a monoclonal origin: a case report

Sta. Ines, Flora Mae

Mixed neuroendocrine-non-neuroendocrine neoplasm (MiNEN) of the gallbladder is a rare tumor that is defined in the World Health Organization (WHO) 2019 digestive system tumor classification as the presence of a neuroendocrine neoplasm admixed with a non-neuroendocrine carcinoma, each component constituting at least 30% of the neoplasm. The exact pathogenesis of MiNENs remains unclear. We present a case of a 74-year-old Filipino woman who presented with nonspecific clinical and radiologic findings and subsequently underwent cholecystectomy. Histopathologic and immunohistochemical evaluation of the gallbladder confirmed the diagnosis of a mixed well-differentiated adenocarcinoma (30%) and large cell neuroendocrine carcinoma (70%). The adenocarcinoma and neuroendocrine carcinoma components were separately microdissected and submitted for targeted 15-gene sequencing using the Illumina Trusight Tumor 15 (TST15) panel. NGS identified a TP53 missense mutation leading to a stop codon in both components. The finding of similar molecular signatures in the

two morphologically distinct components supports the hypothesis that MiNEN arises from a common precursor stem cell capable of divergent phenotypic differentiation.

Keywords: gall bladder, MiNEN, molecular analysis, Medicine

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2019,
(Filipiniana Analytics)

0606

A ten-year retrospective study on the survival outcomes among post-hysterectomy cervical cancer patients

Rivera, Roxanne Uy, Cole, Lilli May T.

Cervical cancer is the most common gynecologic malignancy in the Philippines despite being a preventable disease. Radical hysterectomy with pelvic lymphadenectomy is considered the standard surgical treatment of choice for patients with cervical cancer confined to the cervix up to the upper vagina. However, recent studies show that a less radical approach can be offered to these patients with comparable outcomes to radical hysterectomy, but with lesser perioperative and post-operative morbidity. The purpose of this study was to compare the outcomes in terms of recurrence and survival among cervical cancer patients who underwent simple hysterectomy and radical hysterectomy seen in a tertiary government hospital. The records of all cervical cancer patients who underwent radical hysterectomy and simple hysterectomy for the past ten years were reviewed. The incidence of cervical cancer patients who underwent simple hysterectomy from 2009-2018 is 0.37 per 100 person years or 0.592:16, lower than 1:16 ratio from 1964-1974, as reported by Manalo and Sotto.¹ Only 9 out of 42 patients who underwent simple hysterectomy had cervical cancer screening within 1 year prior to surgery. The most common indication for surgery was myoma uteri. Those who underwent radical hysterectomy had better recurrence free survival and overall survival than those who had simple hysterectomy.

Keywords: Cervical Cancer, Simple Hysterectomy, Radical Hysterectomy, Medicine

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(Filipiniana Analytics)
NP

0607

Ten-year survival analysis of Filipino patients with systemic lupus erythematosus at the national kidney and transplant institute

Cruz-Bermudez, Charito, Yap, Emily Mae L.

Systemic lupus erythematosus (SLE) is increasingly being diagnosed in our country. This study aims to describe the clinical features, management strategies and outcome of patients with SLE during a ten-year period. This is a retrospective cohort study of patients first diagnosed with SLE at the National Kidney and Transplant Institute in 2004 who were then followed up in the next ten years. Eighty-five patients were first diagnosed with SLE in 2004. The mean age was 28.1 ± 12.03 years old. Hypertension (34.12%) was the most common co-morbid illness. Renal involvement (74.12%) was seen in a majority but only those with cardiopulmonary manifestations (mean=0.71 years, $p=0.030$) significantly affected survival. Eleven patients (12.94%) expired during the study period. Active disease and infection were the most common causes of death. Biopsy-proven lupus nephritis had a significantly higher survival rate (mean=10.57 years, $p=0.006$). Those on hemodialysis had a significantly lower survival time (mean=8.82 years, $p=0.040$). The estimated 10-year cumulative survival rate of patients with SLE in our cohort was 75%. This is comparable to the rates reported in some countries. Regular follow-up at six to eight weeks intervals with more frequent follow-up for patients with an SLE flare and/or on intensive immunosuppression was the most likely reason for studies reporting higher survival rates. The disparity in the survival rates may also be

attributed to the frequency of exacerbations with better survival among those who never had exacerbations. The most common cause of death was due to septic shock secondary to pneumonia. The authors believe that one factor that was contributory to death was the degree of immunosuppression as observed in studies describing high doses of corticosteroids on those who have died. The cumulative survival rate decreased from 90% at the time of diagnosis to 75% on the tenth year which was comparable to several countries. Patients with cardiopulmonary manifestations were found to significantly affect survival in this study. Although renal involvement was the most common initial manifestation, it did not significantly affect survival similar to other studies. However, biopsy-proven lupus nephritis cases had better survival since this allowed treatment to be streamlined based on the class of lupus nephritis. Active disease and infection were the most common causes of death.

Keywords: *Systemic lupus erythematosus, SLE, Lupus nephritis, Filipino, Survival, Medicine*

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0608

Term delivery following ruptured tubo-ovarian abscess in early pregnancy

Soriano-Estrella, Agnes L. , España, Muriel L.

Tubo-ovarian abscess in pregnancy is extremely rare. Its occurrence increases the maternal and fetal morbidities and mortalities. The clinical presentation is variable ranging from asymptomatic abscess to diffuse peritonitis. In this report, we present a rare case of tubo-ovarian abscess complicating a pregnancy on its 6 weeks and 5 days age of gestation. The patient presented with frank peritonitis. Internal examination revealed uterine, adnexal and cervical tenderness with no masses palpated. A laparotomy was done and intra-operative findings showed an 8 x 4 cm-sized, right, ruptured tubo-ovarian abscess with purulent contamination of the whole pelvic cavity. Right salpingo-oophorectomy was performed and parenteral antibiotics were given. The pregnancy was eventually carried to term and the patient delivered by repeat low segment cesarean section without fetal and maternal complications.

Keywords: *Pregnancy, Tubo-ovarian abscess, Term delivery, Medicine*

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0609

Term, live, primary ovarian pregnancy: a case report

Soriano-Estrella, Agnes L. , Acda, Mary Menuro F.

Primary ovarian pregnancy accounts for less than 1% of all cases of ectopic pregnancies. Its diagnosis is most commonly made intra-operatively and the approach in its management has been geared towards conservative measures such as oophorectomy and resection. Use of intrauterine device still remains the most established risk factor for the development of ovarian pregnancy. The diagnosis is established following the criteria first described by Spiegelberg in 1878. Several cases of ovarian gestation have been described in literature, although very few cases with live term fetus have been reported. Majority of the cases were diagnosed intra-operatively, and the management was tailored depending on the complexity of each of the different cases. This paper reports a case of primary ovarian pregnancy with a live term fetus, which was only diagnosed intra-operatively. Total hysterectomy with right salpingo-oophorectomy was performed due to difficulties encountered brought about by dense adhesions.

Keywords: *Ectopic pregnancy, Ovarian pregnancy, Primary ovarian pregnancy, Medicine*

Thoraco-lumbar hemangiolymphangioma diagnosed antenatally by ultrasonography
Salvacion, Mutya S.A., Medina, Cleofe B.

This is a case of a fetus with a complex cystic structure on the mid-thorax to the lumbar area detected by ultrasonography at 23 weeks age of gestation. There were no other structural abnormalities noted. The fetal Doppler of the middle cerebral and umbilical arteries were normal. The increase in size of the cystic mass, diagnosed as lymphangioma, and the appearance of pleural effusion at 27 weeks age of gestation prompted further surveillance with magnetic resonance imaging. It showed an extensive subcutaneous mass involving the right thoraco-lumbar region, to consider hemangioma. Expectant management, bringing the pregnancy close to term as possible, was planned. However, the progression of the effusion to the bilateral hemithorax and presence of fetal ascites led to the cesarean delivery of a live preterm male with a birthweight of 1,885 grams (4 lbs 1 oz), maturity index of 29 weeks and an Apgar score of 4, 7, 8 at the first, fifth and tenth minute of life. There was a 15 x 13 cm hemangiolymphangioma on the right thoraco-lumbar area. An ultrasound-guided thoracentesis was done to help alleviate fetal distress. The infant was observed in the neonatal intensive care unit and was sent home stable. Presently, the hemangiolymphangioma is gradually resolving.

Keywords: *Vascular malformation, Lymphangioma, Hemangioma, Hemangiolymphangioma, Antenatal ultrasound, Fetal magnetic resonance imaging, Medicine*

Three-dimensional power doppler angiography characteristic in validating the preoperative accuracy of myometrial and cervical involvement in women with endometrial cancer

Pangilinan, Nelinda Catherine P. , Almoneda-Morante, Ria Rachelle

The Lead Vessel and Infiltrating Vessels are findings in endometrial cancer that are well visualized by three-dimensional power Doppler angiography. Vessel diameter and length may be utilized as markers for deep myometrial and or cervical involvement. To determine the accuracy of Lead vessel and Infiltrating vessel dimensions in assessing the depth of myometrial invasion in endometrial cancer and its cervical involvement. All women histopathologically diagnosed with endometrial cancer, undergoing surgical staging, with informed consent were included. Sonography using GE Voluson S8 system for describing the uterus and endometrial thickness were followed by a 3D power Doppler Angiography to analyze the depth of myometrial invasion and presence or absence of cervical involvement. Vessel diameter and length in transverse and sagittal plane were measured by calipers. Predictive values and operating characteristics (sensitivity, specificity, positive and negative predictive values) were computed. A total of eleven cases (superficial n=5; deep=6) were identified. The cut-off for Lead vessel and Infiltrating vessel in the sagittal view was (diameter > 0.28; length >0.47) and for the transverse view was (diameter >0.36, length >0.5). Among the four measurements, the sagittal diameter (98.3%), sagittal length (100%) and the transverse length (100%) measurements of the Lead and Infiltrating vessel gives the highest predictive accuracy. Three-dimensional power Doppler angiography measurement of the Lead and Infiltrating vessels are associated with improved accuracy and reliability in predicting deep myometrial invasion.

Keywords: *3D-PDA, Lead Vessel, Infiltrating Vessel, Endometrial CA, Medicine*

Timely and conservative anticoagulation in septic cavernous sinus thrombosis: a case report

Jumaani, Salip Nastra, Enriquez, Kevin Paul DA., Kalbi, Mukta

Cavernous Sinus Thrombosis (CST) is a rare and life-threatening condition with antibiotics as the mainstay of therapy for those due to infection. While controversy exists, recent retrospective reviews using anticoagulation reveal potential mortality reduction with a low risk of adverse events such as intracranial hemorrhage (ICH). The optimal timing and duration of treatment are unknown. We report a 32-year-old female who presented with fever, headache, complete bilateral ophthalmoplegia, cellulitis, and a cranial MRV diagnostic of CST. She received antibiotics targeted to MRSA organisms isolated from eye and blood specimen. Further, into the course, the patient had an onset of aphasia and right-sided hemiplegia. Workup revealed multiple cranial infarcts with narrowing of the left internal carotid artery, likely representing thrombus as the source of embolism. The decision to anticoagulate was reevaluated and subsequently started. The patient was reassessed clinically after two months to have improved motor strength and speech return; thus, anticoagulation was discontinued. Although data are lacking, most recent reports favor the use of anticoagulation. Some authors recommend initiation in patients with deteriorating neurologic status despite antibiotics and hydration. The higher frequency of ICH in anticoagulated CST patients with CNS infection is a basis for some authors to withhold treatment. The treatment duration varies with different studies, generally ranging from several weeks to three months or more. Further studies are needed to define the exact role of anticoagulation, particularly its timing and duration. Nevertheless, timely identification of the condition and constant re-evaluation are critical to early patient recovery.

Keywords: *Septic Cavernous Sinus Thrombosis, Anticoagulation, Treatment Duration, Medicine*

Tocilizumab for refractory adult-onset still's disease: report of three cases

Cuenco, Francis Martin T., Navarra, Sandra V.

To present three cases of adult-onset still's disease (AOSD) who was initially refractory to corticosteroid therapy but were successfully treated with an interleukin-6 (IL-6) inhibitor, tocilizumab (TCZ). Adult-onset Still's Disease (AOSD) is a systemic inflammatory disorder of unknown etiology characterized by quotidian fever, evanescent rash, and arthritis/arthralgia. The pro-inflammatory cytokine interleukin (IL) – 6 has been implicated in its pathogenesis. Three patients (40F, 37F, and 27M) presented with quotidian fever, evanescent maculopapular rash, arthritis, anemia, leukocytosis, elevated acute phase reactants and hyperferritinemia of 3 to 4 months duration. All were diagnosed AOSD by Yamaguchi criteria after extensive work up to exclude other diagnostic possibilities. Each patient received high dose corticosteroids and 2 patients also received methotrexate (MTX) with initial improvement of symptoms. However, there was recurrence and exacerbation of clinical symptoms on tapering of steroid doses. Each patient was then given TCZ at 8 mg/kg. Within a month of the initial dose of TCZ, there was dramatic clinical and laboratory improvement, enabling rapid steroid dose tapering. This series substantiates the role of IL-6 in the pathomechanisms of AOSD and demonstrates use of TCZ in the management of AOSD refractory to corticosteroids.

Keywords: *Adult-onset Stills disease (AOSD), Refractory, Interleukin-6 (IL 6), Tocilizumab (TCZ), Medicine*

Transcervical foley catheter versus laminaria: a randomized controlled trial comparing efficacy and safety in facilitating cervical dilatation in cases of molar pregnancies

Soriano-Estrella, Agnes L. , Adolfo, Raquel P.

This study aimed to compare the efficacy and safety of foley catheter versus laminaria in facilitating cervical dilatation among patients with molar pregnancy. This was a randomized controlled trial carried out from September 1, 2013 to September 30, 2014. Fifty-two patients with hydatidiform mole were randomly allocated to either the control or treatment group. Laminaria was used in the control group to facilitate cervical dilatation prior to molar evacuation while foley catheter was used in the treatment group. The primary outcome was the rate of successful cervical dilatation. Amount of bleeding, level of pain, presence of foul-smelling vaginal discharge, and febrile episode were noted. The two-tailed Wilcoxon rank sum test was used to determine difference between the two groups. A significantly higher rate of successful cervical dilatation was seen in the foley catheter group (1.6 mm/hr vs 1 mm/hr), as evidenced by shorter duration from placement of mechanical dilator to successful cervical dilatation (9.5 hours vs 12 hours) and the lack of need for insertion of additional cervical dilator (0 vs 1). Compared to laminaria, foley catheter took a significantly shorter time to insert (5 mins vs 1 min) and was significantly less painful (VAS 5 vs VAS 0). Estimated blood loss, relative risk for pelvic pain, febrile episodes, profuse bleeding, and foul-smelling discharge did not differ significantly between the two groups. Foley catheter may be an alternative in facilitating cervical dilatation for molar pregnancies. Foley catheter has the advantage of being readily available, with lower cost and lack of systemic or serious side effects.

Keywords: *Hydatidiform mole, Laminaria, Foley catheter, Mechanical induction of labor, Medicine*

Transverse myelitis preexisting in pregnancy: a case report

Galang, Katherine Abegail P., Lim, Catherine Grace L.

Transverse myelitis is an acute inflammatory lesion of the spinal cord resulting in motor, sensory, and autonomic dysfunction. Pregnancy increases risk of complications depending on the level of the spinal cord lesion. Hence, a multidisciplinary approach is needed during prenatal period. This is a case of IB, a 32 year-old primigravid, a known case of Transverse Myelitis, initially seen at ten weeks age of gestation. Prenatal course was managed accordingly. She underwent primary cesarean section for arrest in cervical dilatation at 39 weeks, with an unremarkable post-operative course. There is an increased risk of preventable complications such as recurrent urinary tract infections, anemia, development of decubitus ulcers, premature labor and delivery and autonomic dysreflexia. It is imperative that during the prenatal period, the patient be monitored closely and referred to specialists for further management of these simple to fatal complications.

Keywords: *Complications, Multidisciplinary approach, Pregnancy, Transverse myelitis, Medicine*

Tubal ligation and salpingectomy and the risk of epithelial ovarian cancer: a case-control study

Toral, Jean Anne B. , Tingne, Cyriel Anthony I.

Epithelial ovarian carcinoma is the most lethal of the gynecologic malignancies. Recent theories on the etiopathogenesis of epithelial ovarian carcinoma supported the presence of occult, early stage neoplasms in the fimbriated end of the fallopian tube even before development of ovarian carcinoma. This study is interested in correlating opportunistic salpingectomy or tubal ligation as a possible effective prevention strategy in the occurrence of epithelial ovarian carcinoma. To determine the association between the occurrence of epithelial ovarian carcinoma and a previous history of tubal ligation and/ or salpingectomy This is a case-control study involving chart review of patients who underwent total hysterectomy with bilateral salpingoophorectomy with a histologically verified epithelial ovarian cancer (cases) and patients who underwent same surgical procedure for benign gynecologic conditions specifically myoma uteri and adenomyosis with normal ovaries on final histology report (controls). The association between the occurrence of epithelial ovarian carcinoma and previous tubal ligation and/or salpingectomy was determined using appropriate statistical methods. A total of 558 patients were included in this review. They were divided into 158 post-surgical patients with histologically verified epithelial ovarian cancer (cases) and 400 post-surgical patients for benign gynecologic conditions with normal ovaries on final histology report (controls). Adjusted for age, parity and obesity the odds of developing epithelial ovarian carcinoma in subjects without previous tubal ligation and/or salpingectomy is 29%. The result of the study showed that tubal ligation and/or salpingectomy reduces the risk of developing epithelial ovarian carcinoma hence for patients at average risk of ovarian cancer, risk-reducing salpingectomy should be discussed and at the time of abdominal or pelvic surgery. It must also be included in the counseling of women planning a hysterectomy for benign indications to conserve ovarian function and prevent ovarian epithelial carcinoma.

Keywords: *Epithelial ovarian carcinoma, Tubal ligation, Prevention, Medicine*

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Tuberculosis in pregnancy resulting to congenital tuberculosis: a case report

Juego-Magbuhos, Anna Lyn T., Fallarme, Analyn F.

Tuberculosis (TB) has been known to be nearly as old as human history. In 2017 WHO Global TB report, in the Philippines the incidence rate was 554/100,000. Tuberculosis contributed to a significant proportion of the global burden of disease, and has significant effect on maternal and perinatal outcomes. Congenital tuberculosis is a rare complication in utero of tuberculosis infection^{1,20} with reported incidence of only 358 cases in literature up to 1995 and another 110 cases reported between 1995 and 2009. This paper discusses the case of a 17-year-old young primigravida, diagnosed with tuberculosis few months before pregnancy and treated with first-line quadruple anti-TB regimen. However, she developed jaundice with elevated liver enzymes, hence, the medications were discontinued. Re-challenge of anti-TB drugs were done, however, the patient persistently showed signs and symptoms of adverse drug reactions to anti- TB drugs. At 29 weeks age of gestation, she was admitted for control of preterm labor. Congenital anomaly scanning showed hepatomegaly, intraabdominal abscess, and pseudocyst formation, suggestive of congenital TB. Because of this, the anti- TB drugs were re-introduced despite the elevated liver enzymes with closer monitoring of liver function tests. However, despite aggressive tocolysis, the patient eventually delivered preterm to a live baby boy with poor outcome. The baby expired on the 18th day of life.

Keywords: *Tuberculosis, Pregnancy, Congenital TB, Medicine*

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Twisted fate: successful management of hypovolemic shock due to abruptio placenta secondary to uterine torsion complicated by unilateral absence of adnexa

Melchor, Kimberly Christine B., dela Concepcion-Co, Lily Rose

Uterine Torsion is defined as rotation of the uterus of more than 45 degrees on its long axis. It is an unusual complication of pregnancy and for most obstetricians, it probably represents “once-in-a-lifetime” diagnosis. A 32-year old multipara at 30 week gestation with abdominal pain is presented. Laparotomy was performed for the diagnosis of hypovolemic shock secondary to suspected abruptio placenta. Intraoperatively, uterine torsion was observed with unilateral absence of the right adnexa. Prompt decision making with aggressive immediate management resulted to favorable maternal outcome. **(Author's abstract)**

Keywords: *Adnexal absence, Absent fallopian tube, Absent ovary, Uterine torsion, Abruptio placenta, Medicine*

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Typhoid ileitis with periappendicitis: a case report

Ipong, Joanna Rose B., Librado, Dax Ronald O.

Typhoid fever usually presents with prolonged fever associated with constitutional symptoms of headache and abdominal pain. Patients living in far flung areas often downplayed this condition with a viral infection causing delay in diagnosis. We present a case of a 30-year-old male diagnosed with typhoid fever who developed upper gastrointestinal bleeding with intraoperative finding of periappendicitis. This is a case of a 30-year-old male patient presented in the emergency room with abdominal pain and high fever for three weeks. Physical examination showed he was fairly dehydrated with dry lips and tongue and abdominal examination revealed epigastric pain on deep palpation. Initially, his laboratory tests were unrevealing. Over the course of his confinement he was given multiple transfusion due to profused hematochezia and with sudden reduction in hematocrit count thus was referred to surgical service for emergency laparotomy. Intraoperative findings showed bleeding ulcers in the ileum accompanied by histologic findings of periappendicitis which originally thought of as acute suppurative appendicitis. It is important to consider in patients with three or more weeks with typhoid fever its complications of intestinal bleeding. However, the finding of periappendicitis contributes a rare and not easily diagnosed pathology which is not within the context of an enteric infection.

Keywords: *Case report ileitis, Typhoid ileitis, Periappendicitis, Typhoid fever, Salmonella, Medicine*

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Unexpected acute respiratory failure following administration of rocuronium bromide during cesarean delivery in a severely preeclamptic parturient treated with magnesium sulfate

Armovit, Erlinda N. , Macalintal, Joseph Carl M.

Magnesium sulfate has been a mainstay in the management of preeclampsia and is associated with a decreased incidence of morbidity and mortality. The hypertensive disorder has an unpredictable course, sometimes rapidly evolving to full-blown disease. In patients with deteriorating status, it is indicated to terminate the pregnancy via cesarean section. The anesthesiologists would prefer to have the procedure done under regional anesthesia; however, there may be cases when neuraxial anesthesia is contraindicated, or a general anesthesia would permit prompt delivery of the fetus. A patient with severe preeclampsia was given magnesium sulfate intrapartum, wherein a primary cesarean section was indicated for arrest in cervical dilatation, and was performed under general anesthesia. The patient developed acute respiratory failure and the causes of this occurrence were investigated in this report. It was later found out that neither the hypermagnesemia nor the muscle relaxant alone caused the patient's condition but the interaction between the two. The patient was managed expectantly at the intensive care unit (ICU) and was eventually extubated during the first post-operative day. Knowledge of this drug interaction would allow obstetricians to advise their patients and their family about the possibility of prolonged intubation and ICU admission. This would also bring to the anesthesiologists' attention the need to decrease the dose of muscle relaxant and to prepare drugs for immediate decurarisatation.

Keywords: *Magnesium sulfate, Preeclampsia, Eclampsia, Preeclampsia with severe features, Rocuronium, Medicine*

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An unusual cause of fever, rash, and joint pain: a case report of adult onset stills disease

Robles, Jeremy Jones F. , Durano, Redentor R. II

Adult-Onset Still's Disease is a rare inflammatory disorder with an estimated incidence of 1 in 1,000,000 that presents with a rash, fever, and arthritis. Furthermore, there have only been three reported cases in the Philippines. Its presentation is similar to other more commonly encountered inflammatory disorders; however, it is the negative immunologic and serologic workup that typically distinguishes this rare specific inflammatory disorder along with the fulfillment of diagnostic criteria set by Yamaguchi and Cush. This is a case of an 18-year-old female who presented with recurrent fever, rash, and polyarthritis. The patient underwent extensive workup, but immunologic studies were negative. A consideration of Adult-Onset Stills Disease was made and along with the fulfillment of the classification criteria set by Yamaguchi and Cush, the diagnosis was clinched and the patient was started on glucocorticoid therapy where improvement of the patient's condition was noted with the resolution of the fever, rash and minimal complaints of joint pain. Adult-Onset Still's Disease is an uncommon inflammatory disorder that confers high morbidity and disability. It commonly presents with shared clinical features among other inflammatory disorders; thus, recognition of the existence of this disease entity could pose a diagnostic dilemma. A high clinical suspicion along with negative studies and fulfillment of the diagnostic criteria avoids unnecessary workup and inappropriate management.

Keywords: *Stills Disease, Arthritis, Autoimmune, Yamaguchi Criteria, Cush Criteria, Fautrel Criteria, Medicine*

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An unusual manifestation of an HIV patient with fungimea presenting with cryptococcal lymphadenitis

Mendoza, III, Democrito Jan Christiaan Z., Librado, Dax Ronald O.

Cryptococcus neoformans (*C. neoformans*) is a fungus which infects the lungs, meninges, skin and the nervous system. In tropical countries prevalent with tuberculosis (TB), initial clinical presentations of a *C. neoformans* infection can normally be mistaken as a TB infection. The *C. neoformans* infection shall then form part of the differential diagnosis. Exposure to *C. neoformans* does not usually manifest as an infection however, in immunocompromised patients this results to cryptococcosis. This is a case of a 33-year-old male who was admitted due to febrile seizures. He was suspected to be in an immunocompromised state due to multiple sexual partners. A non-tender, mobile left cervical lymphadenopathy was subjected to FNAB (fine needle aspiration biopsy) surprisingly came out to be cryptococcal in nature. He was managed as a case of disseminated cryptococcosis with meningeal extension. He was given amphotericin B and fluconazole. The most common suspected cause of lymphadenitis in the Philippines is attributed to TB. The high index of suspicion based on sound medical history and physical examination can lead the clinician into considering an uncommon cause of lymphadenopathy most especially in patients with high likelihood of immunocompromised state.

Keywords: *Cryptococcosis, C. neoformans, Cryptococcal lymphadenitis, Cryptococcal meningitis, HIV, Medicine*

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Uterine arteriovenous malformation in pregnancy: a case report

Soriano-Estrella, Agnes L. , Elauria, Jean Aileen M.

Uterine arteriovenous malformation (AVM) is a web of arteries and veins lacking an intervening capillary network. Color flow Doppler is a popular method of diagnosis of uterine AVM. The definitive management is hysterectomy. However, for patients desirous of pregnancy, transarterial embolization is a safe and effective option. Although rare, uterine AVM can complicate pregnancy with torrential bleeding due to hormonal changes and significant remodeling of the myometrium. We report a case of a term pregnancy in a 33 year old with a uterine AVM and a previous transarterial embolization procedure who developed a uterine AVM during multi-agent chemotherapy for gestational trophoblastic disease. She consulted for prenatal checkup. Due to the risk of massive bleeding during labor, she underwent elective cesarean section at term and delivered a baby with good outcome. This case suggests that uterine AVM in pregnancy can be managed conservatively with serial ultrasound monitoring and close follow up.

Keywords: *Uterine arteriovenous malformation (AVM), Transarterial embolization, Pregnancy, Gestational trophoblastic neoplasia, Medicine*

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Uterine inversion associated with malignancy - a challenge in surgical management: a case report

Misuari-Alihuddin, Jehada-Inn U., Germar, Maria Julieta V.

Uterine inversion is a rare clinical problem. Most cases of uterine inversions are puerperal inversions wherein it is encountered as an obstetric emergency, and sometimes a diagnostic challenge in gynecology. Uterine inversions associated with malignancies such as endometrial carcinoma and sarcoma are even rare. We report 2 cases of this rare condition. A 55 year old diagnosed with endometrial carcinoma and a 60-year-old woman diagnosed with sarcoma (malignant mixed mullerian tumor) presented with mass protruding from the vaginal introitus. The diagnosis of complete uterine inversion was confirmed in both cases during laparotomy. Total abdominal and vaginal hysterectomy and bilateral salpingo-oophorectomy, bilateral pelvic lymph node dissection, paraaortic lymph node sampling was done. It required a challenging surgical procedure to remove the tumor along with the review of literature especially of its association with malignancies.

Keywords: *Uterine inversion, Endometrial adenocarcinoma, Malignant mixed Mullerian tumor, Medicine*

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Vaginal agenesis: a case report

Alcantara, Marie Janice S. , Barinaga, Sigrid A. , Tan, Reyalu T.

Congenital anomalies of the vagina are rare congenital anomalies. Women born with this anomaly present with collection of blood in the uterine cavity or hematometra and pelvic pain. Presented is a case of a 12-year old girl with hypogastric pain and primary amenorrhea complicated by vaginal agenesis. She was managed conservatively by creating a neovagina with the use of bipudendal flap or Modified Singapore flap. Management can be non-surgical or surgical but the management of congenital vaginal agenesis remains controversial. The decision to do a conservative surgical procedure or a hysterectomy depends on the clinical profile of the patient, the expertise of the surgeons, the extent of the anomaly, and its association to other congenital anomalies.

Keywords: *Vaginal Agenesis, Hematometra, Primary Amenorrhea, Modified Singapore flap, Medicine*

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Vaginal fluid creatinine for the detection of pre-labor rupture of membranes

Ocampo-Tapia, Minnou S. , Cortez, Feliza Vida D.

Prelabor rupture of membranes (PROM) occurs in 8% of all pregnancies and is a major cause of preterm birth and perinatal morbidity and mortality. In 47% of cases, clinicians are uncertain regarding the diagnosis of PROM based on examination and history alone. A misdiagnosis often leads to unnecessary interventions that may be detrimental to mother and fetus. There is currently no ideal noninvasive diagnostic test that can diagnose prelabor rupture of membranes with certainty. This study aims to determine if a quantitative assay of vaginal fluid creatinine can correctly diagnose prelabor rupture of membranes in women with singleton pregnancies at 28-42

weeks age of gestation. A prospective study was performed at a tertiary hospital from December 2015 to August 2017 with a computed sample size of 180 patients (60 per group). If a history of watery discharge was confirmed by egress of fluid, then the patient was included in the Ruptured membranes group. If despite a history of watery discharge, no egress is noted, then she was included in the Unsure membrane status group. 60 women with normal pregnancies were randomly chosen for the control group. Vaginal fluid was collected for Litmus Paper, Fern, and Vaginal Fluid Creatinine Tests. Vaginal fluid creatinine at 1.00 mg/dL has higher sensitivity, specificity, positive and negative predictive values, and a higher positive likelihood ratio than the litmus paper or ferning tests. High accuracy values, with a low false negative rate of 0, and a large AUC make vaginal fluid creatinine an excellent test for the detection of PROM, in accordance with previous studies.

Keywords: *Prelabor rupture of membranes, PROM, Creatinine, PPRM, Preterm prelabor rupture of membranes, Amniotic fluid, Litmus paper test, Nitrazine test, Ferning, Medicine*

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0627

Vaginal versus cesarean breech delivery: maternal and neonatal outcomes at Bulacan Medical Center – a two-year retrospective study

San Pedro, Alejandro R. , Galiza, Rodante P. , Teotico, Angelita R. , Delos Santos-Borgonia, Jerica Miah

To compare the maternal and neonatal outcome of vaginal and cesarean breech deliveries at Bulacan Medical Center. A two-year retrospective descriptive study on all patients who delivered breech by vaginal or cesarean section from January 1, 2012 to December 31, 2013. The maternal and neonatal outcomes were compared and analyzed. There were 165 deliveries included during the study period. There were 83 cases of vaginal breech delivery and 82 cases of cesarean breech delivery. The incidence and risk of postpartum hemorrhage is higher among cesarean breech delivery (7%). Febrile morbidity($p=0.0223$) is significantly lower for vaginal breech births. Cesarean breech delivery is correlated with longer hospital stay ($p<0.0001$). There were no significant differences on the incidence of asphyxia (5% vs 2%, $RR=0.51$, $RD=-2\%$, $p=0.4141$), birth trauma (2% vs 1%, $RR=0.51$, $RD=-1\%$, $p=0.5673$) and sepsis (12% vs 9%, $RR=0.71$, $RD=-4\%$, $p=0.4582$) for vaginal or cesarean breech delivery. Prolonged hospital stay is 2.10 times more likely to occur for cesarean breech deliveries compared with vaginal breech deliveries. Thus, shorter hospital stay means lesser hospital costs for both mother and babies. There is no significant difference in maternal and perinatal morbidity and mortality between vaginal and cesarean breech delivery except for longer hospital stay and increased febrile morbidity for cesarean births. It is therefore safe to recommend vaginal breech delivery under hospital-specific guidelines for labor management such as strict selection of patients, high quality fetal monitoring and high level of competence among obstetricians to deliver breech.

Keywords: *Breech, Cesarean section, Pregnancy complications, Pregnancy outcome, Medicine*

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Validation of readings of locally made cardiocotogram (RxBox 2) model 2 compared with standard equipment

Aguilar, Angela S. , Decano, Serines Viria

The RxBox 2 Model 2 is a portable device developed by the National TeleHealth Center capable of measuring various physiologic signals including fetal heart beat and uterine contractions, making it able to act as a cardiocotogram. The first model of the RxBox 2 was used in an observational cross-sectional study and was noted to have a low accuracy compared with the standard cardiocotogram. An adjustment was made with the objective of improving the sensitivity and specificity. The objective of this diagnostic cross-sectional study is to validate the RxBox 2 Model 2 by comparing its sensitivity and specificity with that of the standard cardiocotogram in detecting Category II traces. The results of this study exhibited an improvement in the sensitivity (77% versus 60%) and specificity (71% versus 61%). In terms of accuracy, there is no significant difference between the high risk and non-high risk groups. These contribute to the validity of RxBox 2 Model 2 as an acceptable screening tool. Further studies may still be done to improve the correlation of each component of the trace to that of the standard cardiocotogram. Detailed analysis of the interpretations with corresponding interventions and perinatal outcomes may aid in validating the device.

Keywords: *Telemedicine, Perinatology, Perinatal care, Maternal health, Medicine*

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NP

Validation of the novel basal metabolic rate prediction equation among adult overweight and obese Filipino patients

Yumul, Sachi , Reyes, Rina R. , Igasan, Karna , Navarrete, Donnabelle Faye , Dampil, Oliver Allan C. , Santos, Maria Regina C.

Various methods and equations are available to predict the basal metabolic rate (BMR). A published study comparing the Harris-Benedict Equation, Bioelectrical Impedance Analysis, and Indirect Calorimetry (IC), was done among Filipinos, and was able to obtain a novel formula for BMR. The purpose of this study is to validate this novel formula. This is a multi-center, cross-sectional, validation study of the novel BMR equation, done among adult overweight and obese Filipinos, who were seen at St. Luke's Medical Center and Providence Hospital in Quezon City, Outpatient Clinics from August 2019 to March 2020. Purposive sampling was done, and upon giving consent, subjects had undergone interview, anthropometrics measurement, and IC. 174 samples were enrolled. Mean age is 43 years old, majority are females. 27% have no co-morbidities; of those with co-morbidities, half have diabetes mellitus (DM). Mean weight is 74.30 kg; mean BMI is 29.78 kg/m². The mean computed BMR is 1174.70 kcal/day, which is 145.83 significantly lower than the BMR derived with calorimetry: 1320.53 kcal/day (P-value 0.000). However, the scatterplot reveals the linearity of positive direction for both values. 31% of the computed BMR fell within the +/-10% estimate of the actual BMR. Stratification of the results between those with DM and without, lowered the difference between the calculated and actual BMR to 46 kcal/day (from 145.83) among the DM subgroup, and increased the estimated accuracy to 38% falling within the +/- 10% estimate of the actual values. The novel BMR formula is linearly reflective of the basal metabolism of adult overweight and obese Filipinos, but the numerical values are lower compared to actual calorimetry results, yielding more accuracy when applied among patients with diabetes.

Keywords: *Basal metabolic rate, Indirect calorimetry, Obesity management, Medicine*

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(Filipiniana Analytics)

Vasopressor discontinuation order in the recovery phase of septic shock: a systematic review and meta-analysis

Albay, Albert , Angeles, Roland Reuben , Barbon, Carla Emille , Zamora, Mithi Kalayaan, Guevarra, Daniel

Septic shock causes life threatening organ dysfunction needing vasopressor despite adequate fluid resuscitation. Numerous studies and meta-analysis have proven norepinephrine as the initial vasopressor of choice in septic shock with vasopressin as add-on. Although guidelines have established the goal monitoring response in septic shock, optimal approach in discontinuation of the vasopressors in the recovery phase of septic shock remains limited. A systematic review and meta-analysis was performed on randomized controlled trials (RCTs) and non-randomized studies comparing incidence of hypotension within 24 hours of discontinuing norepinephrine first versus vasopressin. Three reviewers independently selected studies, assessed their quality, and extracted the following data: the number and characteristics of patients enrolled, inclusion and exclusion criteria for each study, the description of interventions (discontinuing norepinephrine first versus discontinuing vasopressin first) and outcomes (incidence of hypotension within 24 hours). Seven retrospective cohort studies and one prospective randomized control trial were included. Compared with norepinephrine, risk of hypotension is higher when vasopressin is discontinued first among patients in the recovery phase of septic shock (RR 2.06; 95% CI [1.11,3.82]; I² 91%). Results were consistent in the subgroup analysis after excluding abstract-only and poor-quality studies (RR 1.73; 95% CI [0.74, 4.03]; I² 93%). There is no difference in ICU (RR 0.97; 95% CI [0.71, 1.32]; I² 38%) and in-hospital mortality (RR 0.88; 95% CI [0.66, 1.16]; I² 41%) between the two vasopressor weaning strategies. Finally ICU length of stay was reported on 5 studies with no significant difference between the two strategies. Based on the results, there is increased risk of hypotension when vasopressin is discontinued first versus norepinephrine.

Keywords: *Systematic review and meta-analysis, Vasopressor, Discontinuation, Septic shock, Norepinephrine, Vasopressin, Medicine*

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NP

Vulvar edema in pregnancy: a case report

Aquino, Charisse Anne F., Soriano-Estrella, Agnes L.

Isolated massive vulvar edema in pregnancy is rare. The causative mechanisms remain poorly understood but it is probably related to mechanical, osmotic and hormonal factors. The differential diagnoses of vulvar edema include infections, tumors, lymph birth defects, trauma, inflammatory and metabolic diseases. This is a case of a 24-year-old primigravid with twin pregnancy who was admitted at 24 weeks age of gestation for massive vulvar edema. Reported causes of vulvar edema were ruled out. The aim of this report is to discuss the clinical aspects, differential diagnosis, causes and evolution of vulvar edema in pregnancy.

Keywords: *Edema, Twin pregnancy, Vulva, Medicine*

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NP

Young or old, this condition may unfold: the use of ultrasound in the diagnosis of a wide spectrum of Herlyn Werner Wunderlich Syndrome, a case series

Dimatatac, Mari Stefanie S., Dee, Marlyn T.

Herlyn-Werner-Wunderlich syndrome, characterized by uterus didelphys with blind hemivagina and ipsilateral renal agenesis, is a rare Mullerian duct anomaly. This case series shows a wide spectrum of the condition, one presenting in an adolescent, managed conservatively and the other in the perimenopausal age group given a more definitive management. The first case is an 18-year-old nulligravid who manifested with progressive dysmenorrhea and foul smelling vaginal discharge a few years after menarche. She subsequently underwent vaginal septotomy followed by diagnostic hysteroscopy. On the other hand, the second case is a 46-year-old nulligravid whose chief complaint is a foul smelling vaginal discharge and consequently went through a total abdominal hysterectomy with salpingo-oophorectomy. To our knowledge, the second case is the only patient diagnosed in the perimenopausal stage and underwent a total hysterectomy. Ultrasound is the first-line imaging modality used in both cases and its merits are highlighted to prove its importance and diagnostic value in the workup of this condition.

Keywords: *Uterine didelphys, Obstructed hemivagina, Renal agenesis, Herlyn-Werner-Wunderlich Syndrome, Mullerian duct anomaly, 2D Ultrasound, 3D Ultrasound, Medicine*

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SOCIAL SCIENCES

Emotion dysregulations as mediator on the relationship of perfectionism and suicidal desire

Bacal, Rhianna Charleen

Suicide cases have been prevalent in college students nowadays. The high standards placed upon them by society or themselves contribute to an individual's suicidal desire. Perfectionists tend to have deficits in emotion regulation and emotionally dysregulated individuals have higher risks for suicidal desire. This study provides an analysis and evaluation of how emotion dysregulation mediates the relationship of perfectionism and suicidal desire. A survey was conducted among 200 college students. Mediation analysis using Model 4 of the Conditional Process Analysis by Hayes and Sobel test was used to analyze the data. Results of the data show that all relationships are significant. In particular, perfectionism was found to be a predictor of suicidal desire. Moreover, emotion dysregulation partially mediates between perfectionism and suicidal desire. The study finds that college students have high standards for themselves and failure to achieve these may lead to suicidal desire. The study also finds that college students do not regulate their emotions well when not meeting their standards which may lead to a person's suicidal desire.

Keywords: *emotion dysregulation, perfectionism, suicidal desire, Social sciences*

Antorcha, Volume No. 6 Issue No. 2,

2019,
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The Japan-Philippines economic partnership agreement, a decade after: evaluating the impact on Philippine trade

Quimba, Francis Mark A.

The Japan-Philippines Economic Partnership Agreement (JPEPA), the first bilateral FTA that the Philippines entered into, aims to facilitate and promote free transborder flow of goods, services, capital, and people between the two countries. This paper explores the use of synthetic control method to understand the effects of JPEPA on Philippine exports. The results reveal that the Philippines benefited from the JPEPA as determined by the difference in the actual exports and the counterfactual exports.

Keywords: *JPEA, Japan-Philippines Economic Partnership Agreement, Free Trade Agreement, transborder flow of goods, Philippine exports, Trade and industry, Social sciences*

Philippine Journal of Development, Volume No. 45 Issue No. 1,
2018,
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The orality and orthopraxy of the adherents of the primal religion

Eres, Bernaldo P., Ph.D.

This study examines the Orality and Orthopraxy of the adherents of Primal Religion (PR) in Negros Occidental. There are two (2) groups and sub-groups of medicine people of indigenous in character being studied/investigated for the Negrosbased believers of PR. The Non-structured (NSPs) and Structured participants (SPs) are working for spiritual healing in two separate worldviews. The former are the spiritual leaders and fraternity who are working closely with the Church's sponsored health programs. The latter are the group of faith healers who are conducting the traditional spiritual healing without the influence of the official religion. They are composed of the local shaman manughilot/manugluy-a with single and multi-function activities in conducting the spiritual healing. Furthermore, this study brings nuances to the worldview found among the cultural carrier of PR in Negros Occidental long before the western missionaries came into the Negros Island. Moreover, the comparative analysis which is the inter-play between the NSPs and SPs, gives a new breathe of religious ideas drawn out of reflection in an emerging and unique culture of shamanism in Negros Occidental.

Keywords: *orality, orthopraxy, primal religion, Social sciences*

Luz y Saber, Volume No. 1 Issue No. 1,
2007,
(Filipiniana Analytics)

Participatory governance institutions for social housing in the philippines: do local housing boards matter?

Ballesteros, Marife M.

This study documents the application of participatory governance for social housing in the Philippines through the local housing boards (LHBs), which are seen to have a crucial role in the adoption of inclusive social housing programs and policies. It shows that local government units (LGUs) vary in their implementation of the LHBs. For instance, the LHBs that serve only as clearinghouses for the eviction and demolition activities of some LGUs have a limited role as an institution for participatory governance. On the other hand, social housing policies and projects that cater to the poor are evident among LGUs with functioning LHBs.

Keywords: *land use, social housing, participatory governance, local housing board, urban development and housing, Social sciences*

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0637

The quality world of institutionalized elderlies

Fullero, Gerrie Mae A.

This phenomenological study explored the Quality World of the elderlies living inside an institution called institutionalized elderlies. In Choice Theory, Quality World is part of the Perceived World and it is described as "personal picture album" of all the people, things, ideas, and ideals that individuals have discovered increase the quality of their lives, to fulfill a person's needs. Basic Human Needs are the general motivation for all behavior of human, the Quality World is the specific motivation. The Basic Human Needs describe what people need, the Quality World pictures detail how people meet those needs. Seven institutionalized elderlies were purposively recruited. Interview proceedings and interpretation of drawings were tape-recorded and were later on transcribed. Transcribed data was categorized and thematised into four thematic levels of the institutionalized elderlies Quality World. Findings of this study will be helpful in giving valuable inputs in the psychological utility of elderly's needs and wants using the lens of Choice Theory. Also, for the care providers and health professionals in the institution in providing a better assistance for the institutionalized elderlies.

Keywords: *phenomenological, quality world, institutionalized elderlies, perceived world, human needs, Social sciences*

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ZOOLOGY

0638

Serologic status of Newcastle disease in native chickens by hemagglutination inhibition test

Adlawon, Arlyn Jaye B.

Newcastle disease (NCD) is a poultry disease caused by avian Paramyxovirus type 1, characterized by gastrointestinal, respiratory and neurological symptoms. The study established the prevalence of NCD in native chickens and evaluated the protection levels of vaccinated chickens. Blood serum samples were subjected to hemagglutination inhibition test. A total of 75 blood samples were collected from five sites in Davao City: 60 samples from four unvaccinated native chicken farms, and 15 from a vaccinated broiler farm. Results showed seven (7) unvaccinated native chickens with positive titer levels ranging from 2 to 32, of which two(2) were considered significant, indicating protection even without an elicited immune response. This cannot be simply attributed to environmental factors considering uniform exposure of other individuals to similar conditions but exhibited no positive titers. The significant titer count of vaccinated samples ranging from 16 to 128 is attributed to their vaccination history. Differences in titer levels despite similar vaccine administration indicate a disparity in levels of protection due to different individual antibody immune responses, and efficacy of vaccines. Analysis by Chi-square goodness of fit test showed no difference in the titer levels of native chickens, which was expected as they did not have previous exposure to NCD and most had no titers. The two significant titer levels were considered outliers and provided a possible genetic perspective with pre-immune antibodies and natural resistance

of native chickens as the focus. Gene analysis and isolation, as well as the prevalence of NCD in other localities, are recommended for future studies.

Keywords: *Newcastle disease, Paramyxovirus type 1, native chicken, serology, hemagglutination inhibition test, Zoology*

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Cuenza, Lucky R.	0589 0348	de Jesus, Ma. Sheryll R.	0378	dela Concepcion-Co, Lily Rose	0618
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Cupino, Diana J.	0423	de la Cruz, Christian Paul P.	0234	Dela Cruz, Sheryl Ann B.	0598
Dalanao, Evervic Joy G.	0393	de Lara, Ayolani V.	0258	Dela Cruz, Sheryl Ann B.	0458
Dalawangbayan, Maria Anna Luisa F.	0452	De Leon, Maria Edwardina G.	0364	dela Llana, Kathlynn Ann R.	0342
Dampil, Oliver Allan C.	0629	De Leon, Zelda Sue C.	0602	Dela Peña, Eden May	0195
Danao, Louis Angelo M.	0108	De Los Reyes, Denise C.	0576	dela Rea, Mariel Anne C.	0476
Daniella, Dian	0346	De Los Reyes, Francia Victoria	0398	Dela Rosa, Catherine Rose DG.	0371
Darmawan, Guntur	0347 0582	de Luna, Catherine C.	0215	dela Vega, Joela Mizchelle A.	0247
Das, Asmita	0480	De Marco, Paulo Jr.	0062	Delena, Mary Ann C.	0384
Datar, Francisco A.	0202	de Paula, Luciano Barcellos	0243	Delfino, Ariel N.	0290
David-Bustamante, Lara Marie	0354	De Quiros, Melissa Lourdes B.	0474	Delgado-Marquez, Blanca L.	0282
Davis, Frank W.	0091	De Ramos, Joanne Sebastiana M.	0449	Delos Reyes, Maria Theresa A.	0028
Dayo, Maria Helen F.	0287	Decano, Serines Virian D.C.	0628	Delos Santos-Borgonia, Jerica Miah	0627
de Boda, Miguel Paolo	0195	Decena, Ditas Cristina D.	0538		0075
De Castro-Malig, Marie Aleli	0563	Decena, Katrina Immaculada F.	0487	Demafelis, Rex B.	0085
de Guia, Anna Pauline O.	0251 0041		0534		0297
de Guia-Liwanag, Ma. Teresita S.	0427	Dee, Marlyn T.	0581 0632	Depositario, Dinah Pura T.	0290
de Guzman, Glaiza S.	0478 0520	Deegan, Linda A.	0205	Deterala, Sheryl M.	0494
de Guzman, Jose Luis E.	0227	Defiesta, Gay	0271	Detras, Monet Concepcion M.	0176
de Guzman, Lucille Elna P.	0002	Del Mundo, Daryl Anne A.	0368	Diansuy, Nina Nonette	0439

Diawatan, Ma. Melissa F.	0571	Dulin, Jerome L.	0291	Enriquez, Kevin Paul DA.	0612
	0387	Dumaguin, Kris Ray A.	0504	Eramo, Matthew J.	0046
Dichoso, Marian C.	0476	Dumalanta, Rochelle S.	0097	Eres, Bernaldo P., Ph.D.	0635
	0509				
	0566	Durano, II, Redentor R.	0621	Esaki, Masatoshi	0026
Dimagiba, Richard Raymond N.	0157				0002
Dimalanta, Carla B.	0252	Duran-Ranada, Geebee Mae M.	0426		0251
Dimatatac, Mari Stefanie S.	0632	Durante, Marcelito L.	0437	Espaldon, Maria Victoria O.	0293
Diola, Nathaniel B.	0180	Dustin, Christopher M	0055		0297
	0217				0216
Dizon, Josefina T.	0290	Dutta, Amit	0197		0265
	0304	Duya, Jose Eduardo D.	0526	Espallardo, Myza C.	0201
Dizon, Romeo M.	0212	Dy Echo, Ana	0457		0500
Doan, Thi-huyen	0163	Victoria V.	0499	España, Muriel L.	0608
Dobson, Andy	0091	Dy, Danilo T.	0027	Espectato, Liberty N.	0310
Dofitas, Mary Stephanie M.	0528	Ebo, Jenny Beb	0322	Espino-Strebel, Elizabeth E.	0479
Dolinaj, Dragan	0305	Ebrahimi, Mahdieh	0158		0600
Dolny, Ales	0062	Ecarna, Raquel Victoria	0564	Espiritu- Concepcion, Marnie Ann	0397
Domae, Eisuke	0035	Edrial, Jennifer D.	0234	Esquibel, Ma. Imee	0498
Domingo, Ayedee Ace M.	0596	Efroymsen, Rebecca A.	0284	Lynne C.	
	0340	Ehrlich, Paul	0090	Estabillo, Mia	0135
Domingo, Efren J.	0435			Shaira	
		Elauria, Jean Aileen	0365	Estuart, Darleen SJ.	0381
Dominguez, Anna Eloisa M.	0353	M.	0623	Evangelista, Regine Joy P.	0327
Dorado, Moises A.	0075	Elauria, Jessie C.	0191		0179
Dorado, Rowena A.	0098	Elauria, Marilyn M.	0191	Evans, Geoffrey	0185
Doronila, Augustine I.	0329	Eleazar, Pamela	0085		0283
Dosdos, Kristina L.	0468	Joyce M.		Ewert, Alan W.	
Drechsler, Wolfgang	0018	Elep, Rachel V.	0452	Ezeofor, Chidinma C.	0068
		Elio, Thelma Marie Avendano	0533		
Du, Angela A.	0585		0147	Factor, Patricia Ann	0448
Du, Binbin	0149	Ella, Victor B.	0255	A.	0491
Du, Gang	0167	Elomina, Kevin	0462	Fagariba, Clifford James	0245
	0555	Endo, Rie	0119		
Dueñas, Rommel Z.	0414	Engay-Gutierrez, Kathreena G.	0264	Fahmy, Afaf S	0042
Duka, Maurice A.	0117			Fajarito, Cariñez Dela Cruz	0331
		Enquist, Brian J.	0091	Fallah, Asghar	0248

	0561	Fornillos, Raffy Jay C.	0051	Gamboa, Michelle E.	0388
Fallarme, Analyn F.	0472				
	0617	Francisco-Ortega, Javier	0067	Gamutan, Jonah	0164
Fatoba, Paul O.	0058				0198
Faustino-Eslava, Decibel V.	0252	Franco, Danielito T.	0200	Gao, Jintao	0575
					0150
Favila, Abelardo M.	0227	Frederick, Muyot B.	0311	Gao, Xu	0152
Feinsinger, Peter	0043	Froehlich, Halley E.	0091	Gao, Yujiao	0228
Felizmenio, Edgardo	0087	Fu, Guiqin	0115	Garcia, Fernando B. Jr.	0350
Feng, An-Ning	0579	Fu, Jie	0260	Garcia, John Carlo S.	0193
Feng, Hao	0127	Fujii, Hidetoshi	0140	Garcia, Maria Ines A.	0401
Feril, Joseph G.	0203	Fujiyama, Hiroki	0076		
Fernando, Katherine Mae	0598	Fukuda, Mitsunori	0044	Garcia-Ojeda, Marcos E.	0063
		Fukuda, Takashi	0159		
Fernando, Kenneth Brian M.	0528	Fukushima, Yoshihiro	0143	Gavel, Dharm Jeet	0160
				Geges, Dhino B.	0088
Festin-Dalawangbayan, Maria Anna Luisa L.	0464	Fullero, Gerrie Mae A.	0637	Gęgotek, Agnieszka	0074
	0560	Funakawa, Yoshimasa	0163	Gellada, Lorna D.	0203
Figueras, Izabelle Julienne A.	0578	Furoc-Paelmo, Roselyn	0246	Geller, Herbert M	0052
Findley, Kip O.	0161	Fusin-Herrera, Lenor P.	0518	Genuino, Homer C.	0191
	0261			George, Jack	0570
Flavier, Maxima E.	0297	Gabaldon, May S.	0561	Geraldino, Nelson T.	0340
		Gacal, Genesis Raymond B.	0497	Gerber, Leah R.	0091
Flickinger, Jonathan	0067				0416
	0247	Gacho, Carmel C.	0045	Germar, Maria Julieta V.	0449
	0251	Gacrama, Edward Nino J.	0495		0624
Florece, Leonardo M.	0307	Gagarin, Mariel M.	0321		0280
	0255	Galang, Daphne Gayle	0456	Gevana, Dixon T.	0207
	0210			Ghollasimod, Sholeh	0241
	0244	Galang, Katherine Abegail P.	0376	Giagonia, Lindsay D.	0320
Flores, Herisadel P.	0010		0615	Giblin, Anne E.	0205
Folke, Carl	0090	Galarpe, Van Ryan Kristopher R.	0206	Gil-Armeza, Angeline A.	0427
Fomeg-as, David Y.	0226				
Fontaiña, Eduardo Fernandez	0132	Galbo, Pherdes E.	0341	Go, Criscely L.	0412
		Galiza, Rodante P.	0627	Go, Gay Amabelle	0135
Formosa, Luke E.	0046	Gallego, Errol M.	0313	Go, Marianne Rose L.	0396
		Galli, Fausto	0222		

Gomez, Jose	0005		0136	Ignacio, Josephine	0406
Edgardo A. Jr.		Hanima, Raja	0183	G.	
Gomez, Romeo A.	0226	Farzarul		Iijima, Miho	0048
Jr.		Hanson, Haley E.	0037	Ikeda, Kazuhiro	0506
Gonong, Danielle	0502	Hara, Nobuyoshi	0112	Ikeda, Rinsei	0140
Anne		Harabis, Filip	0062	Ilago, Simeon	0017
Gonzaga, Florante	0482	Harada, Yusuke	0189	Agustin	
P.		Harvey, Tobin	0185		0280
Gonzaga, Zarinah	0405	Hashimoto, Hiroshi	0594	Im, Sangjun	0207
G.	0364	Haskew-Layton,		Imperio-Onglao,	0569
Gonzales, Ma	0456	Renee	0096	Romelyn April P.	
Cecilia		Hassall,		Imura, Masahito	0154
Goodwin, R.	0315	Christopher	0062	Inaguma, Toru	0104
Andrew		He, Huibin	0296	Inoue, Satoshi	0506
Gorgonio, Liza	0546		0256	Ipong, Joanna Rose	0619
Karina I.		He, Li	0232	B.	
	0546			Irabon, Ina S.	0532
	0420	Hemati, Sara	0285	Irshad, Muhammad	0238
Gorgonio, Nephtali	0353	Hernandez, Elfleda	0379	Atif	
M.	0429	A.		Ishida, Toshinori	0154
	0537	Hernandez, Erika	0386		0049
Go-Suva, Leilani	0418	Gail G.		Ishihara, Naotada	0050
Goto, Sota	0163	Hernandez, Homer	0212	Ishihara, Takaya	0050
Gould, Rachelle K.	0249	B.		Ishii, Jun	0107
Grunsvan, Roy Van	0062	Herrera, Jose	0096	Isidro, Maria	0456
Guan, Dongsheng	0209	Higashi, Sayuri L.	0052	Jocelyn	
Guerra-Calilung,	0482	Hirabayashi,	0580		0122
Joanna Marie O.		Yoshio		Isihihara, Shingo	0129
Guevarra, Daniel	0630	Hirahara, Ichiro	0475		0178
		Hirai, Yuya	0035	Iskandar, Diana	0351
Guevarra, Donaver	0244	Ho, James	0345	Ismail, Azma	0302
M.		Hoang, Vo Trong	0231	Hanim	
Guinto, Mary Grace	0336	Holgado, Polla	0477	Itabashi, Daisuke	0123
C.		Lorence K.	0344	Izquierdo, Andrea	0043
Gutierrez, Bernard	0045	Hong, Pui-Kwan	0275	E.	
Jude M.		Andy	0275	Jacobs, Howard T.	0570
Habana, Maria	0596	Howarth, Richard	0090	Jahanifar, Komeil	0218
Antonia E.	0532	B.		Jang, Mina	0223
Hall, Rosalie	0287	Hughes, Terry	0090	Jara, Raul D.	0604
Arcala		Husin, Ahmad	0183	Jastrzab, Anna	0074
Halpern, Benjamin	0091	Khairi		Javelosa, Ranulfo	0437
S.		Igarashi, Kazuhiko	0082	B. Jr.	
Halstead, David	0062	Igarashi, Michihiro	0044		0370
Hanao, Masahito	0119	Igasan, Karna	0629		

Javier, Maria Jane Ellise S.	0405	Larrazabal, Ramon B. Jr.	0551 0517	Liong, Yves Jean Y.	0531
Jia, Junjie	0306	Lasangen, Wileen Chiara T.	0226	Lipo, Renie R	0324
Jimena, Carla Edith G.	0088 0097	Lasco, Jonathan David D.	0117	Lizada, Joy C.	0287
Jimeno, Cecilia A.	0549		0327	Llamado, Arlene L.	0036
Jin, Denan	0475		0201	Llamas-Clark, Erlidia F.	0350 0438
Jin, Wujun	0077	Lasco, Rodel D.	0286	Llarena, Frederick R.	0564
Johnson, David S.	0130 0205		0299	Llave, Cecilia L.	0350 0478
Jones, Colin	0062	Laude, Rita P.	0251	Lo, Melson John C.	0319
Jorge, Manuel C.	0591 0356	Laurio, Michael Vincent O.	0176	Lo, Raymundo	0450
Jose, Stella Marie L.	0359 0422 0423	Lazo, Hossanah Harriet M.	0603	Lopez-Toro, Alberto	0295
Juego-Magbuhos, Anna Lyn T.	0617	Lazo, Stephanie M.	0227	Lorenzo, Lara Mae	0503
Juen, Leandro	0062	Lee Yu, Melody Hope L.	0528	Loria, Ma. Elizabeth E.	0563
Jumawan, Celestina Q.	0308	Lee, Carla Lenice	0499	Lortie, Christopher J.	0091
Jung, In-Ho	0118	Leyte, James Elwyn D.	0220	Lozanta, Ana Mae Kristine H.	0101
Junia, Alex T.	0360	Liberato, Raymund Darius C.	0497		0389
Kanapi, Maria Princess L.	0505	Librado, Dax Ronald O.	0619 0622	Lu-Lasala, Lynnette R.	0390 0413
Kwan, Charita S.	0272	Licuanan, Wilfredo Roehl Y.	0212	Lumbres, Roscinto Ian C.	0223 0326
Labrador, Lauren Angelica R.	0557	Lim, Catherine Grace L.	0615	Luna, Amelita C.	0325 0369
Lachica, Joseph Anthony	0528	Lim, Rossini Abbie	0469	Luna, Jericho	0524
Lagare, Jezzel Joice G.	0413	Lim, Vanessa Marie Ty	0533	Thaddeus P.	0569 0595
Lagos, Devralin T.	0097	Lim-Alba, Rebecca	0518	Luna-Sun, Ma. Patricia	0546
Lagunday, Noel E.	0059	Limgenco-Hipe, Juneth Ria R.	0377	Macabanding, Jamailah Bautil	0430
Lalican, Nelita M.	0216 0291	Lim-Navarro, Lilibeth	0429	Macabuag-Oliva, Andrea	0456
Landicho, Leila D.	0215	Lim-Pacoli, Mae Rhea	0409	Macalintal, Joseph Carl M.	0620
Lanzuela, Noemi SB.	0313	Limson, Margaret Joyce C.	0520	Macandog, Damasa M.	0268
Lao, Susana Siy	0374	Linan, Efren L.	0255		
Lapis, Aida B.	0028	Lindarto, Dharma	0358		
Laraga, Socorro H.	0059				

Macandog, Paula Beatrice M.	0234	Manabat, Manuel S.	0600	Matanguihan, Anna Elaine D.	0297
Macaspac, Hannah Erika D.	0108 0157	Manahan, Maria Regina P.	0554	Matibag, Viktoria Ines P.	0586
Macayaon, Annette M.	0532	Manalastas, Ricardo M.	0365	Matsumaru, Daisuke	0040
Maceren-Medina, Catherine Irene L.	0355	Manalo, Eileen M.	0490	Matsumoto, Kunio	0415
Madamba, Helen V.	0362	Manansala, John Victor H.	0293	Matsuno, Hidetoshi	0128
Madera, Jennifer O.	0425	Mandap, Marco C.	0335	Matsuo, Hidenori	0463
Magadia, Bernadette T.	0297	Mangondato-Lucman, Fatmah B.	0571	Matsushita, Muneo	0140
Magbujos-Salagubang, Mary Rose	0003	Mangubat, Ma. Luisa T.	0532	Matundan, Katherine R.	0599
Magcale-	0056	Manila, Antonio C.	0300	Maung, Myo Win	0216
Macandog, Damasa	0234	Manlosa, Aisa O.	0307	Mauricio, Maricel D.	0577
Magdalita, Pablito M.	0001	Mansoor, Asma	0239	Mazzacano, Celeste Searles	0062
Magistrado, Myleen L.	0311	Mapacpac, John Christian V.	0220	McCartney, Melissa	0067
Magno, Angelito D.L.	0532	Maquiran-Tambalo, Paulette A.	0539	McInturff, Alex	0094
Magno, Belmar T.	0581	Maranger, Roxane	0093	McLaughlin, Robert L.	0315
Magno, Jose Donato A.	0392	Maravilla, Lilibeth	0512	Medalla, Renee Riza C.	0524
Magpantay, Gracetine D.	0028	Marcaban, Menabelle A.	0399	Medina, Ana Marie O.	0437
Magpantay, Maria H.	0001	Maria Theresa M. Mutia	0318	Medina, Celia dR.	0233
Malagad, John G.	0203	Mariano, Rico Antonio S	0054	Medina, Cleofe B.	0610
Malamug, John	0293	Marquez, Shiara Marriz T.	0466	Medina, Martin Antonio B.	0543 0568
Malayang, Ben S. III	0274	Marquez, Teodorico L. Jr.	0234	Medina, Pier Angeli	0529
Malenab, Ma. Charisma T.	0088	Martin, Carolina Paula C.	0553	Medina, Plebeian	0424
Maligalig, Dalisay S.	0085	Martin, Javier	0459	Medina-Guce, Czarina	0020
Maligaya, Hazel	0098	Martin, Lynn B.	0037	Medrano, Ana Beatriz R.	0495 0348
Mallari, Rhea DC.	0070	Martinez, Ma. Angelica Martha A.	0468	Meghaddam, Fazel Mohammadi	0285
Mallari, Romina Grizelda O.	0443	Maruoka, Nobuhiro	0184	Mei, Yan	0522
Maloy, Stuart A.	0161	Masalunga, Marvin	0375	Melchor, Kimberly Christine B.	0618
		Masbang, Armin N.	0535	Melloy, Marin	0063
		Masuda, Shinji	0053	Memarian, Hadi	0241
		Masuda, Yuki	0154		

	0108	Micor, Jose Rene L.	0070	Muramatsu, Hisashi	0463
Mena, Manolo G.	0157	Migo, Veronica P.	0176	Murao, Lara Jessica G.	0380
	0175	Miguel, Rhoselle P.	0556		
Mendiola, Patricia Ann G.	0600		0125	Murata, Daisuke	0048
		Miki, Takahiro	0150	Murphy, Anna E.	0205
Mendoza, III, Democrito Jan Christiaan Z.	0622		0164	Muto, Izumi	0112
		Miki, Yuji	0156		0317
	0359	Millar-Aquino, Martha	0545	Muyot, Myla C.	0318
Mendoza, Irish T.	0422			Nacorda, Hildie Maria E.	0212
Mendoza, Kimberly C.	0445	Misuari-Alihuiddin, Jehada-Inn U.	0624	Nagasaka, Akiomi	0442
		Mitra, Subhasish	0179	Nagasaka, Tetsuya	0164
Mendoza, Ma. Emilinda T.	0097	Miura, Hiromi	0146	Nagase, Haruna	0052
		Miyaoku, Haruna	0463	Nagata, Koji	0072
Mendoza, Maria Czarina	0451	Miyazaki, Erika	0072	Nakaya, Michio	0442
		Miyoshi, Eisuke	0105	Nakayama, Kenichi	0111
Mendoza, Maria Emilinda T.	0098	Mohagan, Alma B.	0059	Nano, Nerissa Gracia G.	0599
	0208	Mohammed, Sagal	0063		
Mendoza, Marie Christine Valerie R.	0474	Mohd Saudi, Ahmad Shakir	0288	Nano-De Guzman, Nerissa	0488
Mendoza, Marie Jo-anne	0087	Molintas, Edgar	0293		
		Montebon, Roberto D.	0274	Nañola, Cleto L. Jr.	0212
Mendoza, Marlo	0176			Napata, Ruby P.	0310
Mendoza, Melanie P.	0385	Morales, Arriane R.	0574	Napiri, Farley Sean	0195
		Mortel, Bernadette Mayumi T.	0567	Narciso, Josefina O.	0001
Mendoza, Milette U.	0227				0129
		Motohashi, Hozumi	0040		0141
Mendoza, Myrna T.	0434	Moubark, Kareem	0330	Natsui, Shungo	0168
Mendoza, Sharon Joyce P.	0420		0297		0178
		Movillon, Jovita L.	0075		0194
Meñez, Lambert Anthony B.	0212		0085	Navarete, Harry C. Jr.	0354
		Mozdzer, Thomas J.	0205		0498
Mercado, Alberto R.	0543				0514
	0441	Muir, Andrew M.	0315	Navarra, Sandra V.	0584
Mercado, Maria Dolores A.	0453	Munoz, Linda	0437		0613
		Muñoz-Cruz, Mary Rose	0408	Navarrete, Donnabelle Faye	0629
Mercado, Susana M.	0075			Navarro, Narro R.	0102
	0443	Munoz-Morante, Catherine Mae	0470	Navarro, Rudy S.	0001
Mercado, Wilhelmina A.	0477			Nawaz, Rab	0238
		Murai, Ryota	0107	Neishi, Yutaka	0154
Merencilla, Maria Roberta D.	0546	Murakami, Yota	0083		
		Muraki, Norifumi	0066		
Metillo, Ephrime B.	0308				
Meza-Prado, Kelly	0249				

Nelson, Gloria Luz M.	0327 0002	Ono, Hideki	0151	Pangilinan, Nelinda Catherine P.	0501 0611
Nelson, James A.	0205	Oracion, Enrique G.	0274		0473
Nidoy, Ma. Kristine Paula M.	0511	Orcasitas, Jessie F.	0576	Panlilio-Vitriolo, Regina Rosario M.	0536 0590
Nierva-Velante, Rosa	0384	Orr, Albert	0062		0227
Njinga, Raymond Limen	0145	Ortega, Purificacion V.	0437	Papa, Rey Donne S.	0033
	0110	Ortego-Centeno, Norberto	0459	Paradiang, Mary Therese C.	0403
Nogami, Hiroshi	0150	Ota, Azusa	0050	Parazo, Mercedita A.	0437
	0162	Ota-Kurogi, Natsuki	0506		0206
Novero, Virgilio M. Jr.	0491 0523	Pabico, Jaderick P.	0234 0258	Parilla, Richard B.	0251
Obinque, Adoracion V.	0312 0309		0269	Park Hyung-Won	0137
	0229	Pacardo, Enrique P.	0297	Park, Hyeon-Woo	0137
Ocampo, Pablo P.	0258		0200	Pasamba, Koleen C.	0473
	0004	Pacio, Allyn E.	0445	Pascua, Pua ala	0249
Ocampo, Romeo B.	0011	Pacuing-Songco, Debby F.	0349 0567	Patetico, Ashmeir Q.	0410
	0019	Padilla, Cherry S.	0220	Pati, Romeo C.	0200
Ocampo, Romeo B. †	0023	Padilla, Patrick Jose D.	0435	Patten, Michael	0062
Ocampo-Tapia, Minnou S.	0626	Paelmo, Roselyn F.	0215	Patupat, Annarose L.	0438
Ochoco-Sotto, Ma. Regale Noemi R.	0399	Pagar, Norman D.	0412	Paul, Koushik	0197
O'dea, Damien	0185	Pajak, Małgorzata	0078	Paulino-Morente, Joanne Marie A.	0558 0363
Ogasawara, Yasushi	0107	Palanca-Tan, Rosalina	0263 0289	Payad, Kristianne A.	0547
Ogunkunle, Clement O.	0058	Palis, Florencia G.	0202	Paz, Joel	0564
Olalia, Madelynne P.	0339	Paller, Vachel Gay V.	0229	Pearson, Craig S	0052
Oliphant, Simone	0067	Palma, Richmund A.	0213	Peart, Mervin Richard	0209
Oliquino-Abasolo, Anacorita	0204	Palma, Rose Ann S.	0516 0036	Pelaez-Crisologo, Ma. Cristina	0601
Olivar, Joseph U.	0407	Pampolina, Nelson M.	0280 0029	Peng, Yuhua	0138
Oliver, Danielle P.	0276	Pan, Hongche	0306	Penolio, Vaneza Valentina L.	0380 0558
Olowoyo, Joshua O.	0301 0031	Panda, Sourav Kumar	0118	Penserga, Kenneth Tee, Ester G.	0377
Ong, David Jerome	0432	Panes, Kristel Danica P.	0489	Peras, Rose Jane J.	0327
Ong, Janus P.	0440	Pang, Yong	0306	Perelonia, Karl Bryan S.	0316 0314

Perez, Blessie Marie	0551	Quilisadio, John Elmer C.	0368 0519	0259 0265
Perez, Diezza Khey B.	0234	Quillooy, Reynaldo B.	0001	0278
Perez, Gay Jane P.	0235	Quimba, Francis Mark A.	0634	Reblora, Marlon A. 0234 0342
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