ABSTRACTS

2018 International Symposium on Advanced Marine Animals & Snake Envenomation Management (AMSEM)

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SYMPOSIUM DAY 1
WEDNESDAY, 24 OCTOBER 2018
Venomous and poisonous animals and plants constitute a near worldwide presence on Planet Earth. Envenoming from snakebites and scorpion stings are respectively the first and second most frequent causes of venom diseases, and present important public health hazards in some countries. These envenomings cause an untold amount of mortality and morbidity, as well as relevant national economic cost due to post-envenoming sequelae. The World Health Organization recently classified snakebite envenoming as one of three globally important “other neglected conditions” included with 17 infectious diseases deemed responsible for a large proportion of morbidity and mortality in the rural “Third World”. Ironically, populations most impacted by venom diseases have the least access and availability of essential management such as effective antivenoms prepared with geographically/population homologous venom immunogen mixtures, mechanical ventilation, and haemodialysis. Marine envenomings commonly cause morbidity, and uncommon fatalities. Although not featured in this brief overview, marine poisonings (e.g. ciguatera, scombroid, etc.), as well as plant and mushroom poisoning (e.g. oleanadrins and amatoxins, respectively) are also globally important toxinological causes of morbidity and mortality. Some examples of venomous animals with particular medical importance will be highlighted, and discussion will consider the biomedical, social and political challenges hindering the amelioration of serious public health problems posed by venom diseases in underserved communities.
AN OVERVIEW OF THE CLINICAL MANAGEMENT OF ENVENOMING BY MARINE ANIMALS

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The marine environment contains many species of animals that have evolved venoms in order to facilitate prey capture and deter potential predators. The popularity of beach recreation, water sports, fishing, boating, snorkelling and SCUBA diving have all increased the likelihood of human interaction with common venomous marine animals such as jellyfish and other cnidarians such as coral, other stinging invertebrates, and venomous fish. Some of these taxa account for most of the envenomings inflicted by marine animals, the majority of which may cause notably painful, transient local effects, and occasionally more significant morbidity, but are not life threatening. However, some cubozoan jellyfish such as the sea wasp or box jellyfish (Chironex fleckeri) and others that cause Irukandji syndrome can inflict life threatening or fatal stings. Less commonly encountered venomous species such as sea snakes, the highly toxic scorpaenid, the stonefish (Synanceja spp.; two species), cone snails (Conus spp.; only a few species of approximately 630 taxa are known to be medically important) and the blue-ringed octopuses (Hapalochlaena spp.; 3 species) occasionally are responsible for severe envenoming and/or life threatening bites/stings, but are commonly sensationalised and thus disproportionally featured as marine hazards. The management of most cnidarian stings consists of application of hot water not exceeding 45°C or acetic acid, depending on the involved species. Treatment of most venomous fish stings/spine penetrations including stingrays is by immersion into hot water. Some stingray injuries may require antibiotics and surgical exploration; rare cases of fatal penetrative envenoming by stingrays have occurred as a consequence of thoracic trauma. Cone snail stings and blue-ringed octopus bites are managed with pressure bandage immobilisation and symptomatic treatment. Envenoming by these species require rapid retrieval to a well-equipped facility (preferably a Level II trauma facility) capable of providing artificial ventilator support, a commonly needed and life-saving practice needed for life threatening cases. Antivenoms are available against the potent venom of C. fleckeri, and the stonefish, and for treatment of bites by medically important sea snakes (Elapidae, multiple genera; only a handful of the approximately 60 species have caused documented envenomings). Important features of these species and evidence-based management of their stings and bites will be discussed.
MARINE ANIMALS AND SNAKES: THEIR VENOMS AND POISONS FOR THERAPEUTICS?

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The discovery and modification of angiotensin converting enzyme inhibitor. Angiotensin converting enzyme inhibitor creation starts when Bothrops jararaca venom was found to be causing hypotension by potentiating-bradykinin activity. Bradykinin-potentiating peptides are also found in Viperidea and Elapidea snake species such as Agkistrodon halys pallas, Bothrop jararacussu, Bothriechis lateralis, Bothriechis schlegelii, Macroivperea lebetina and Naja haje haje. Another example are the atrial natriuretic peptides which are hormones that are endogenously released when myocardium is stretched and overload in the body. These peptides cause natriuresis, inhibition of rennin-angiotensin systA tripeptide (Glutamic acid-Valine-Tryptophan) isolated from Bottrop atrox venom has been shown to protect against the dopaminergic neurons loss in Parkinson’s disease model. Similarly, neurotoxins from Mamba performed antagonist activity with acetylcholinesterase receptors that useful in therapeutic of Alzheimer’s disease. A secretory phospholipase A2 from Naja sputatrix reduced neuronal death and promote cell survival in the organotypic hippocampal culture and possess anti-apoptotic effects and recently, an low molecular weight fraction from B. jarararaca showed protection effects against apoptosis of hippocampal cells induced with H₂O₂. Interestingly, a molecule from South and Central America snake viper, Bothrops asper venom was found to reduce amyloid beta plaque that accumulated in Alzheimer’s disease patient neurons through enhancement Endothelian Converting Enzyme-1 and Neprilysin activity that lead to degradation of amyloid beta protein. These studies showed the potential snake venoms as neuroroprotection or neurotherapeutic source.

On the other hand, research on marine organisms have moved from purely chemical exercise of isolating novel structures to a collaborative effort between marine chemists, molecular pharmacologists, and cell biologists. In the advent of the advanced ‘omics’ technologies in integrated biology, the future of the drug discovery should be enhanced and facilitated. Various bioassays attempting to elucidate the mechanisms between specific enzymes, receptors, and recombinant whole cells are commonly used for identifying marine natural products with potential biomedical uses. This presentation will provide a baseline for further studies on extracting molecules that are potentially important for therapeutics applications.
PLENARY 01c

PREPARATION AGAINST HARMFUL JELLYFISH THREAT DURING THE 4TH PENANG CROSS-CHANNEL SWIM 2018: A SIGNIFICANT MILESTONE

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The speaker will bring the attention of the audience pertaining to the issues with harmful jellyfish envenoming in Penang Malaysia via several case series consulted to the Remote Envenomation Consultancy Services (RECS Malaysia). The current issues on harmful jellyfish envenoming, safety concerns for recreational, and sports events in Malaysia is highlighted by the recent emphasis on safety preparedness and the mandatory attire requirement for the race. The clinical management support and its importance will be discussed. The objectives are to present and discuss:
1. harmful jellyfish envenoming in Penang and Malaysia
2. the clinical manifestations and management of jellyfish envenoming in Malaysia
3. the experiences and challenges of preparations against harmful jellyfish for the 4th Penang Cross-channel swim
Data will be descriptively analysed and presented.
PLENARY 02a

CASES PRESENTATION OF MARINE ANIMAL POISONING IN TAIWAN

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Cases of tetrodotoxins resulted from sea snails, puffer fish, and octopus ingestion were presented. A diagnosis of seafood poisoning is made on the history of seafood ingested and the clinical presentation.

Tetrodotoxin causes an ascending paralysis and the fish ingested are usually distinctive. The clinical presentation of tetrodotoxin and paralytic shellfish poisoning may be similar; the principal symptoms and the seafood eaten can usually be used to determine the specific aetiology. Although a presumptive diagnosis of paralytic shellfish poisoning could be made in a patient who develops neurologic symptoms after ingestion of mussels during seasons of risk in areas where paralytic shellfish poisoning occurs, other causes of neurologic illness should have to be ruled out. Analyses of toxic shellfish and toxic dinoflagellate algal organisms for toxins have helped establish a diagnosis in patients involved in certain outbreaks of shellfish poisonings.
PLENARY 02b

UPROOTING THE IMPACT OF MARINE ENVENOMATION AND POISONING: CHALLENGES IN THE PHILIPPINES’ PERSPECTIVE

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The Philippines is home of diverse flora and fauna and gifted with abundant shorelines and eclectic beaches. Being an archipelago entails a lot of challenges in terms of prompt delivery of health care for those people within the geographically isolated and disadvantaged areas (GIDA). Public health education remains a necessity more than high end medical technology. Innovative research and resourceful minds anchor the health care system to a minimum. The lack of key stakeholders and advocacy groups further hinders the threats of marine envenomation ubiquitous in the country. Underreported morbidity and mortality from marine envenomation and the like are clear indications of lack of documentation and, more importantly, prioritization in this area. Although media seem to work, like a double-edged sword, often causes further confusion to the public for its’ interest. Community enhancement projects and capacity building projects are essential steps in the sustainability of the public health education measures to ensure appropriate health and safety seeking behaviour of the community at risk.
PLENARY 02c

SEA SNAKE ENVENOMING: UNDERSTANDING THE VENOM PROPERTIES AND PRINCIPLES OF MANAGEMENT

Dr Tan Choo Hock

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“Sea elapids” include the true marine sea snakes (genus Hydrophis) and the semi-marine sea kraits (genus Laticauda). These are medically important venomous species distributed mainly in the warm tropical waters of the Indian Ocean and the western Pacific Ocean. Sea elapid envenoming occurs most commonly as a result of bare-hand handling (when removing entangled sea snakes from fishing nets/lines – this is an occupational hazard), or accidental treading on the snakes. The bite is typically painless that may go unnoticed - hence the danger of late presentation, while systemic envenoming complicated by neuromuscular paralysis, rhabdomyolysis and acute kidney injury is fatal. To further elucidate the venom compositions and pathophysiological correlation of envenoming, the venom proteomes of selected sea elapids and antivenom immunoreactivity as well as neutralization were investigated. The venom proteomes of the Malaysian beaked sea snake (Hydrophis schistosus), spine-bellied sea snake (Hydrophis curtus) and the Indonesian yellow-lipped sea krait (Laticauda colubrina) were dominated by alpha-neurotoxins (60–80% total venom proteins) and phospholipases A2 (20–40%) with variable protein subtypes. The sea elapid venoms caused paralysis in mice and were all highly lethal (LD$_{50}$ <0.1 µg/g in mice), consistent with the abundant alpha-neurotoxins (LD$_{50}$ = 0.05-0.20 µg/g) in the venoms. The myotoxic, basic PLA$_2$ in H. schistosus venom was also demonstrated to be highly lethal in mice (LD$_{50}$ = 0.08 µg/g). Sea Snake Antivenom immunoreacted with and neutralized the sea elapid venoms and principal toxins in vivo, with potency levels varied according to the content of short neurotoxins in the venom. Sea snake venoms lack local tissue necrotic effect; hence pressure compression of the envenomed area is important first aid when transporting the patient to nearby medical facility. Sea Snake Antivenom remains the only definitive treatment. Assisted ventilation and adequate hydration with crystalloid may be important life-saving support.
CLINICAL CHARACTERISTICS AND MANAGEMENT OF STING ENVENOMING FROM STONEFISH SPECIES IN MALAYSIA

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The speaker will bring the attention of the audience pertaining to clinical manifestations of sting envenoming from Stonefish, Synanceia sp in Malaysia via several case series consulted to the Remote Envenomation Consultancy Services (RECS Malaysia). The current issues on stonefish species sting envenoming and the appropriate clinical practice with emphasis on the clinical management support will be discussed. The objectives are to present and discuss:
1. the clinical manifestations of sting envenoming from Synanceia spp
2. the clinical management of Synanceia spp envenoming and related issues.
3. the experiences and challenges of RECS in the management of marine sting envenoming in Malaysia

The consultation log of the RECS will be reviewed and analysed. Data will be descriptively presented.

Keywords: Marine Envenomation; Hot Water Immersion; Stonefish

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SYMPOSIUM DAY 2
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KEYNOTE 02

APPLICATIONS OF MASS SPECTROMETRY IN IDENTIFICATION OF POTENTIAL ANTICANCER PROTEINS FROM SNAKE VENOMS

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Mapping of the venoms proteins or now commonly called venomics have been the main approach towards understanding the venomous and destructive nature of venom proteins. These has led to high number of proteomics publications taking advantage of the LCMSMS technologies, that enable the accurate determinations of venoms constituents.

The identification and purification of specific proteins such as L-amino acid oxidase and snake venom metalloproteinase (SVMP from crude venoms from Malaysian snakes such as the Malayan pit vipers (C. rhodostoma and C. purpureomaculatus) demonstrated selective cytotoxic activity on human colon cancer cells. Additionally, SVMP revealed strong inhibition of colon cancer cell migration as demonstrated from wound healing assay. HPLC subfractions with selective cytotoxic activity were analysed with LC-MS/MS and proteins that were detected with high confidence were purified such as L-amino acid oxidase (CR-LAAO) and snake venom C-type lectins (SNACLEC) rhodocetin and rhodocytin. LC-MS/MS and de novo sequencing of the isolated proteins from C. purpureomaculatus revealed amino acid variations highlighting a potential of a novel variant of each of the protein. CP-LAAO demonstrated strong cytotoxic activity and anti-proliferative activity, while CP-SVMP only affects the former. Caspase-3 induction activity was performed on CR-LAAO-, CP-LAAO- and CP-SVMP treated cells and revealed that stronger caspase-3 activity was detected from CR-LAAO and CP-LAAO at 24 hours of treatment and peaked at 48 hours. Bcl-2 cellular protein concentration assay was performed and significant drop of Bcl-2 concentration was identified from both CR- and CP-LAAO treated colon cancer cells. Morphological changes consistent with apoptosis on the LAAO treated cells further supported apoptosis induced cell death. Overall, these data provide evidence on the anticancer activity of several proteins from the venom of Malaysian pit vipers for therapeutic intervention of human colon cancer.

We have also initiated anti-cancer studies on human brain cancer cells using venoms from Malaysian kraits, showed cytotoxic effects of B. candidus and B. fasciatus crude venoms and venom fractions in neuroblastoma cells. Preliminary data strongly suggested potent cytotoxic activities of the venom fractions on neuroblastoma cells. Overall, these data provided evidence on the application of LCMSMS in facilitating the potential anti-cancer activity from the venom of Malaysian snakes for therapeutic intervention.
PLENARY 03a

CLASSIFICATION OF SNAKEBITE USING THE CHAIN CODE METHOD AND K-NEAREST NEIGHBOUR

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Living in a tropical country such as in Indonesia has a high risk of snakebites. One of the causes of death due to snakebites is due to incorrect snake identification by relying only on visually identifying the snake. The difference between a venomous and non-venomous snake on their anatomy results in different bite marks on the victim. Bite marks are useful for medical team to identify venomous snakebites or not, but currently there is no system that helps to solve this problem. This researched tried to build a system to recognize the existing bite points on the snakebite image and then classified them into venomous snakebite or non-venomous using Chain Code and K-Nearest Neighbour. The result of recognizing the bite marks has the sensitivity value of 75.95%, specificity of 52.7% and accuracy of 65%. Classification of snakebites categories has sensitivity value of 76.92%, specificity value of 85.71% and accuracy of 80%.
Snake venoms are starting materials for antivenom production, researches and laboratory assessment. A large number of snakes are needed for venom extraction to supply the high demand of antivenom for Thailand and other countries. Quality systems snake farm has become an important entity in raising snakes in captivity to assure sufficient and high-quality venom supply with traceability, reproducibility and taxonomic accuracy. Furthermore, venom extraction from wild snakes before relocated them is not recommended because it lacks quality control and high mortality rate. Snake farm can reduce the number of snakes captured from nature which is important for wildlife conservation. There are several processes to fulfil the snake farm standardization. The complete veterinary health record during the quarantine period of individual snakes is performed prior to introduction into the farm. Parent stocks of each species are selected and paired in the correct breeding season leading to high production of eggs or offspring. The success in high percentage of hatchlings is related to the conventional artificial incubation. The juveniles are raised with the proper foods. The health of all snakes from all ages is monitored coupled with the correct management in snake husbandry. With optimal care, snakes can yield good venom quality and quantity. Appropriate diagnosis and treatment of illness can prolong the snake’s lifespan in captivity. Research on snakes and their venom provides new data and information which will improve the quality of snake farm production and better understanding on venom mechanism.
PLENARY 03c

UNRAVELLING SNAKE VENOM PROPERTIES THROUGH -OMICS: TOWARD OPTIMIZATION OF ANTIVENOM MANAGEMENT

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To date, more than 200 snake venom proteomes have been studied using various techniques. The development within this subject has led to the reporting of variable and occasionally contradicting details of venom compositions. Integrating C18 reverse-phase HPLC and nano-LCMS/MS, we optimized a venom-decomplexing protocol as a standard approach for profiling and comparing snake venom compositions. This strategy has resulted in the successful unravelling of venom proteomes of several major snake genera including those found in South and Southeast Asia as well as China and Taiwan, where snakebite envenoming remains prevalent. The comprehensive protein profiles of most snake venoms were shown to be variable, driven by factors like captivity and geographical distribution of the snakes. To further understand the implication of snake venom variability in the medical context, the venom proteomics is functionally integrated with immunological and pharmacological studies of antivenoms. This complements the preclinical antivenom assessment through in-depth correlation of antivenom potency with venom composition and pathophysiology of snakebite envenoming, thereby providing the evidence for improving the guideline and recommendation of antivenom use. The research also enables the purification of principal toxins from various venoms. This is a critical step to determine the efficacy and limiting factors of neutralization of an antivenom. This translational approach opens the door to toxin immunogen modification, a strategy, which can enhance the potency and thus the quality of antivenom products. A concerted collaborative effort is needed for comprehensive profiling and mapping of snake venomics in the Asian region.
Snake antivenoms are preparations of immunoglobulin derivatives that play a crucial role in minimizing mortality and morbidity of snakebite envenoming. These preparations are included in the WHO List of Essential Medicines (since 2007) and should be readily available in primary healthcare or emergency facilities in places where snakebites are prevalent. Nevertheless, the supply and the use of antivenom are still a big challenge in many parts of the world, due to factors such as the epidemiological knowledge gap and neglected status of snakebite, the high cost of antivenom production and restricted market size per region, inadequate training of healthcare providers on antivenom storage and use, ambiguous guideline on choosing the right antivenom, the lax regulation and evaluation of some antivenom products in terms of their efficacy and safety profiles. The lack of region- and species-specific antivenoms further aggravates the on-going issue of antivenom crisis. Evidence-based, translational research is needed to explore the strategies to overcome these problems, for instance, the practical issue associated with the availability and suitability of imported and/or hetero-specific antivenom use in many countries in this region. The antivenom products should be subject to stringent preclinical assessment to demonstrate the purity profile and the potential para-specific protection that can be possibly conferred in humans. In this context, current advancement in technologies enables the integration of classical approaches in pharmacology and immunology with big data of various snake venom genes and proteins, opening the gateway to the improvement of antivenom production. An ideal antivenom should be one that has sustainable, affordable supply, excellent physicochemical and immunochemical purity, good toxicity neutralization efficacy against intra-species venom variation, and possibly extended species coverage for para-specific cross-neutralization.

Collaboration among the healthcare providers, pharmaceutical industry and scientists in this region should be encouraged and geared up toward achieving this goal.
PLENARY 04b

EPIDEMIOLOGY AND MANAGEMENT OF SNAKEBITE IN TAIWAN

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There are 6 major venomous snakes in Taiwan including 3 crotaline snakes, *Trimeresurus stejnegeri stejnegeri*, *Protobothrops mucrosquamatus*, and *Deinagkistrodon acutus*; 1 viper, *Daboia siamensis*; and 2 elapids, *Naja atra* and *Bungarus multicinctus multicinctus*. The annual incidence of these venomous snakebites has increased from 361.3 to 965.5 cases in the past 70 years, while the incidence rate declines from 8.8 to 4.3 cases per 100,000 person-years. Overall, the highest frequency of bites is observed for, in descending order, *T. s. stejnegeri*, *P. mucrosquamatus*, *B. m. multicinctus*, *N. atra*, *D. acutus*, and *D. siamensis*. In northern and southern Taiwan, *T. s. stejnegeri* and *P. mucrosquamatus* snakebites account for the majority of cases; in central Taiwan, cases of *N. atra* bites predominate, whereas cases of *D. siamensis* bites only scattered in the southern and eastern areas. In Sawai’s studies during 1960–1970s, the case fatality rate for *T. s. stejnegeri*, *P. mucrosquamatus*, *N. atra*, and *B. m. multicinctus* bites was 0%, 1.4%, 1.6%, and 7.1%, respectively. In a recent study, 3 cases of deaths were reported among 3862 snakebite cases during 2002–2005.

In the prehospital settings, there is no role for incision and suction, electrotherapy, and cryotherapy for snakebite wounds. Routine use of a constriction band or pressure immobilization device is generally not required. The Taiwan government produces 4 types of equine-derived antivenoms to treat these 6 snakebites, namely bivalent antivenom for *T. s. stejnegeri* and *P. mucrosquamatus*, bivalent for *N. atra* and *B. m. multicinctus*, and 2 monovalent for *D. acutus* and *D. siamensis*, respectively. These antivenoms are F(ab′)2 fragment in the lyophilized form containing 2000 units per vial (or at least 1000 Tanaka units). The recommended dosage of relevant antivenom is 1–2 vials for *T. s. stejnegeri* snakebites, 2–4 vials for *P. mucrosquamatus*, 2–4 vials for *D. acutus*, 2–4 vials for *D. siamensis*, 6–10 vials for *N. atra*, and 2–4 vials for *B. m. multicinctus*. The use of antibiotic is suggested when secondary wound infection has developed, and the surgical indications include wound necrosis, abscess formation, distal limb gangrenous change, necrotizing fasciitis, or in rare cases, compartment syndrome. The first operation was performed at a median of 3.5 days after the bite.
PLENARY 04c

“VENOMOUS” BITES FROM NON-VENOMOUS “COLUBRID” SNAKES

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Non-front fanged colubroids (NFFC) have been commonly termed, “rear-fanged”, opisthoglyphous, aglyphous, or “mildly venomous” snakes. NFFC comprise about 70% of extant snake specie. Bites inflicted by about 120 NFFC species have been documented with detail sufficient for risk analysis. Of these, a small subset, designated Hazard level 1, represented those species well documented as having lethal potential. Hazard level 2 species consisted of several taxa that have mixed quality data implicating these as causing rare systemic effects. Hazard level 3 species comprised a larger group capable of producing significant local effects only and this often is associated with a protracted bite. Bites by Hazard level 4 species consisted of the majority of surveyed taxa and these showed only minor effects of no clinical importance. There is an increasing importance of assessing risk associated with NFFC concomitant with the growing exposure to lesser-known species, particularly in captive collections. This growing exposure may uncover further species of significance in the future. Careful and accurate documentation of bites by verified species of NFFC snakes is required to determine the best treatment for patients bitten by little-known NFFC, and increase the evidence base for these taxa.
TOXICITY AND ANTIVENOM NEUTRALIZATION OF KING COBRA
(OPHIOPHAGUS HANNAH) VENOMS FROM FOUR GEOGRAPHICAL LOCALES

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King cobra (Ophiophagus hannah) represents a species complex that is widely distributed in Asia. Its envenomation causes paralytic neurotoxicity and local tissue necrosis. The toxicity and antigenicity of the venom, however, may vary according to the geographical origin of the snake.

This study investigated and compared the lethal effects of king cobra venoms from four different locales (Malaysia, Thailand, Indonesia, China), and the efficacies of two regional antivenoms in binding the venom proteins as well as neutralizing the lethality. Lethality and neutralization of venom were tested in vivo in mice. Antivenom immunoreactivity was studied using enzyme-linked immunosorbent assay (ELISA).

The Indonesian and Chinese king cobra venoms were more lethal (median lethal dose, LD50 ~0.5 μg/g) than the Malaysian and Thai specimens (LD50 ~1.0 μg/g), possibly due to differences between the contents of key toxins in these venoms. The Thai Ophiophagus hannah monovalent antivenom (OHMAV) was highly immunoreactive toward all four king cobra venoms, suggesting that the major protein antigens were well conserved across the venoms from different locales. OHMAV also effectively neutralized the neurotoxicity and lethality induced by the king cobra venoms to different extents (normalized potency = 13-120 mg venom neutralized per g antivenom). In comparison, the hetero-specific antivenom was less immunoreactive and weaker in neutralizing the toxicity caused by the king cobra venoms (~6-10 times less potent).

The findings indicate that a specific king cobra antivenom is needed for effective treatment of king cobra envenomation in the region.

Keywords: Antivenom neutralization; King cobra; Ophiophagus hannah; Monovalent antivenom; Venom lethality

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ABSTRACTS
Oral & Poster Presentations

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SHORTLISTED
FREE PAPER PRESENTATION
(Oral)
Tetrodotoxin poisoning is sporadically encountered in the Philippines, especially in coastal areas, usually attributed to consumption of puffer fish. Although it is common knowledge that the fish is poisonous, it is still occasionally eaten by fishermen. Puffer fish contains tetrodotoxin (TTX) which may cause symptoms such as giddiness, numbness, and tingling sensation of the mouth, paresthesia, and muscle weakness. Severe cases may present with respiratory depression, circulatory failure, and death.

In this case series, we are presented with 5 incidences of tetrodotoxin poisoning due to consumption of puffer fish. There were 2 cases on May 30, 2016, and 3 cases on January 11, 2017. Patients presented with numbness sensation of the mouth and muscle weakness, dyspnea. In the first case, 1 patient was dead on arrival, and the other was admitted and discharged without residual neurologic signs. In the second case, presented with mild symptom, 2 patients were admitted and discharged without residual neurologic signs, while the other elected to leave against medical advice.

The most important aspect during the treatment of TTX poisoning is emergent respiratory care. The public should be made aware of the risks of eating puffer fish, quickly seek medical attention when such symptoms occur. Health professionals should be aware of the condition to institute early and appropriate management.

Keywords: Marine poisoning; Puffer fish; Tetrodotoxin
CHALLENGES IN MANAGING SEVERE JELLYFISH ENVENOMING INVOLVING PAEDIATRIC POPULATION IN THE EAST COAST OF SABAH: A CASE SERIES

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Jellyfish envenoming in Malaysia are under reported and neglected. Several incidences have resulted in morbidity and mortality particularly among paediatric population. We present four paediatric patients with severe jellyfish envenoming that occurred in the East Coast of Sabah, Malaysia.

Case 1 A 7-year-old non-Malaysian boy was stung by an unidentified jellyfish while swimming at the sea in Kunak District. He arrived at the District Hospital 17 minutes later. His mental status deteriorated drastically and developed respiratory failure.

Case 2 A 5-year-old Malaysian girl was stung by an unidentified jellyfish while swimming at Lahad Datu Beach. She arrived at the hospital two hours later with intractable pain, altered sensorium and respiratory depression.

Case 3 An 8-year-old Malaysian boy was stung by jellyfish while swimming at Silam Beach of Lahad Datu. He arrived to the hospital one hour later with intractable pain and developed non-cardiogenic acute pulmonary oedema.

Case 4 A 6-year-old non-Malaysian girl presented to hospital four hours after stung by unidentified jellyfish at Lahad Datu Water Coast. She developed intractable pain, persistent tachycardia, altered sensorium and non-cardiogenic pulmonary oedema.

A diagnosis of box jellyfish envenoming was made based on the clinical presentations and typical skin lesion. Nematocyst sampling from stung areas can help identify jellyfish species. Early consultations with clinical toxinologist help with the appropriate management plan. Access to experts’ assistance, advance life support, box jellyfish antivenom administration and optimal management can reduce morbidity and mortality of jellyfish envenoming.

Keywords: Antivenom; Clinical Toxinology; Envenomation; Jellyfish; Nematocyst

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A RETROSPECTIVE REVIEW OF AMBULANCE DATA IN THE USE OF MAGNESIUM SULFATE & MORPHINE VERSUS MORPHINE ONLY IN IRUKANDJI SYNDROME

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In 2006 Queensland Ambulance Service (QAS), Australia, approved the use of magnesium sulfate for the management of patients with Irukandji syndrome (IS), when conventional pathways have resulted in insufficient reduction in pain and/or hypertension. The aim of this study was to compare final pain scores and blood pressures of patients who had received morphine (Morphine GP n = 35) as their mainstay of treatment, over those that had received a combination of morphine and magnesium (Magnesium GP n = 77).

A retrospective case review of all IS patients between 2007 and 2014. A search of the QAS electronic data base resulted in finding N=112 cases of IS. Analyses in IBM SPSS v.22 was undertaken to determine the outcome in final pain scores and blood pressure reduction in hypertensive patients between the two groups.

A reduction in pain was statistically different ($p = .000$) between the Morphine GP and the Magnesium GP with the mean numerical pain scores post treatment of 4.91 (95\% CI [4.02 – 5.81]) and 2.21 (95\% CI [1.66 – 2.78]) respectively. Of the 74 hypertensive patients, the Magnesium GP were less likely to be hypertensive upon their arrival at a medical facility, with a significant difference between the mean arterial 101 mmHg, 95\% CI [96 – 105]($p = .028$) and diastolic pressure 84 mmHg 95\% CI [80 – 88]($p = .029$) post treatment. Of the 54 cases in the Magnesium GP, 32 were normotensive post treatment compared to only 6 from the Morphine GP (n = 17).

There has been considerable difference in opinion as to the utility of Magnesium, this study suggests that the combination of morphine and magnesium is more effective in treating patients than morphine alone.

\textbf{Keywords:} Hypertension, Irukandji, Magnesium, Morphine, Pain

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EPIDEMIOLOGY OF ANIMAL BITES AND STINGS FOR THE STATE OF PAHANG, MALAYSIA CONSULTED TO RECS BETWEEN 2015-2018

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Pahang is the largest state in the peninsular of Malaysia. It occupies the Pahang river basin and contains many ecotourism and agricultural landmarks. The vastly populated areas include Temerloh, Bentong, Raub, Cameron Highlands, Kuala Lipis, Kuantan, Pekan, and Tioman.

Cases of animal bites and stings documented in the RECS case log from 2015 to 2018 for the state of Pahang were extracted into a standardized data collection sheet. It was descriptively analysed with Statistical Package for the Social Sciences (SPSS) version 25.0.

A total of 313 cases were documented. The majority (80%) were males and 70% were Malaysians. Tourists made up 3.2% of the cases. The median age of envenomation cases were 33 years (SD: 16.2). Unidentified animal bites or stings were 175 (56%), snakebites were 127 (40.5%) and 11 (3.5%) were not related to snakebites. The majority of cases (34%), involves injury to the hands. Most common symptom was localized pain (75.4%) and the most common sign was acute swelling (43%). Tourniquet is the commonest inappropriate prehospital intervention (73.6%). Complications of envenomation (snakes and other animal bite/sting) were death 1 (3.7%); coagulopathy 7 (25.9%); dermonecrosis 6 (22.2%); progressive pain 5 (18.5%) and progressive swelling 4 (14.8%). Antivenom was administered in 60 (23.3%) snakebite envenoming cases. The average length of stay in hospital was 3 days (83.6%); 4 to 7 days (13.4%); >7days (3%).

This study reveals that the awareness of appropriate prehospital intervention and first aid for animal bites and stings in Pahang remains poor. The epidemiological data from this study will be useful in strategizing optimal clinical management at various levels of care.

Keywords: Clinical Toxinology; Consultation; Emergency; Envenomation; RECS

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CAN ETHNOMEDICINE PROVIDE AN HERBAL ANTI-VENOM FOR SNAKE BITE AS CLAIMED BY FOLKLORE?

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Snake venom is a mixture mainly containing proteins exerting complex physiological functions. It has been deadly to mankind however isolated to its singular entity much benefits been already commercialized in fields of cosmeceuticals and pharmaceuticals. Enormous effort been done over the years to study proteins either by the traditional chromatography techniques of isolating one at a time or by the later developed means of proteomics advances capable to study directly on a protein mixture.

This paper provides some examples of studies done on snake venom predominantly found in Malaysia. Venom of snakes such as Ophiophagus hannah, Naja kaouthia, Calloselasma rhodostoma and Bungarus fasciatus are investigated for their lethality and consequently explored for their anti-snake venom potentials utilizing selected plant materials. Studies using one area of proteomics i.e. the two-dimensional electrophoresis gel to map these venoms will be highlighted. The challenges of mapping protein of abundance, elimination of vertical streaks, lack of protein library, the use of cup loading spiking and 2DE guided purification techniques are some of the important findings. Much been claimed in ethnomedicine on the use of plants as an herbal antivenom. One such plant, Mimosa pudica is been explored thoroughly as an example of a plant believed to relieve snake bite traditionally however in laboratory investigations though shown positive for in vitro but fell short in in vivo outcomes.

Hence concluding snake venom to be a mix of complex lethal cocktail to be merely remedied by folklore believe.

Keywords: Antivenom; Mimosa pudica; Snakebite; Tannins; Venom

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THE ROLE OF HERPETOLOGISTS IN ASSISTING WITH SNAKEBITE MANAGEMENT IN INDONESIA

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The rapid growth of human populations increases the risks of snakebite significantly. In Indonesia, snakebite occurrence has been overlooked primarily because of a lack of data. While most victims are poor farmers who lack the means to obtain treatment, wealthier people who live nearer to medical facilities also face problems if they are bitten. In general, medical staff have limited knowledge about snake identification and treatment. Locally-produced antivenom (AV) is currently limited to treatment of only three of approximately 75 venomous snake species that occur throughout the archipelago. The quality of the AV is relatively poor, imported AV is expensive, and may be less effective for treatment of bites that occur far from the site of AV production. Outdated treatment methods are still taught in medical schools, and comprehensive snakebite data are lacking in many hospitals.

Experienced snake catchers can be very useful in increasing public safety, providing education, and crucially, in helping medical staff to provide appropriate treatment. They can also collect locality data for venomous snake species, which can be used to prioritize high risk areas for snakebite.

The recent working together of qualified snake specialists with medical staff provides an opportunity for more accurate snake identification, leading to more effective treatment of bites. The use of social media can help to reduce the time between bites and treatment significantly. Adoption of standardized up to date treatment methods (as outlined in the WHO snakebite management guidelines) will help to increase the chances of survival of snakebite victims.

Keywords: Antivenom; Herpetologist; Identification; Snakes

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ROLE OF OBSERVATIONAL MEDICINE IN SNAKE BITE CASES: A RETROSPECTIVE STUDY

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In snake bite management, anti-venom is the effective antidote for snake venom. However, not all cases may require anti venom, as continuous observational role in managing snake bite has proven beneficial. We have conducted a retrospective study to determine the role of observation in managing snake bite cases in population at our centre.

Case series of patients presenting with snake bite with evidence envenomation was used in data collection tools. The time of onset of clinical features, investigations and progression monitoring of local envenoming were recorded. Outcome was determined by interval hours of observation (ranging from 0 hour up to 48 hours interval), revisit to emergency department within 48 hours post discharge and clinical decision whether anti venom required or otherwise. Data collected from July 2015 until November 2017.

A total of 208 presentations of snake bite were identified with envenoming diagnosed in period of 2 years 3 months. Total 90.4% of cases required admission and all the cases required antivenom. 3.8% was discharged well as the snake was identified as non-venomous (6 Python reticulatus, 1 Enhydris plumbea, 1 Homalopsis buccata). Within observation group 5.7% (n=12), about 50% stayed in emergency department for 12 hours, 33.3% (n=4) observed in ED for 12-24hours. Only 25% (n=3) been observed 24-48 hours. All patient was discharged well with no cases returned to ED within 48 hours post discharged.

Evidence in literature for role of observation in snake bite management is difficult to find. Observation benefits patient in term of cost effectiveness especially in patient asymptomatic of systemic envenomation with minimal local involvement. Currently, we are facing more uninsured and financially unsupported immigrants in daily practices. About 33.3% (5 out of 20 observed patients) are immigrants who had no financial support for admission to medical ward, benefited most from the observational period in the Emergency Department that can cut significance hospital cost.

Snake identification is crucial in determining the management and disposition of a snake bite patient, while 12 hours observation of snake bite in asymptomatic systemic envenomation appears adequate in our centre especially in immigrant workers that faces financial burden.

Keywords: Antivenom; Emergency; Observation; Short Stay Ward; Snakebites

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EPIDEMIOLOGY, INCIDENCE AND OUTCOMES OF SNAKE BITES TREATED IN PENANG GENERAL HOSPITAL, MALAYSIA

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Snake bites are not an infrequent emergency encountered in Malaysia. There are limited studies available on epidemiology, incidences, snake type and treatment of this condition. This is a retrospective study of all snake bite patients treated in Penang General Hospital throughout 2014 till 2017.

A total of 194 patients presented to our hospital following a snake bite incident in this 4-year study period, most of them were males (77%) and from the 21-30 years age group (38%). Majority of snake bites occur from 12pm to 12am (65%), usually on lower (50%) and upper limbs (45%). Most bites were from unidentified snakes (59%); those identified were mainly vipers (18%) and cobras (8%). Fang marks were seen in 73% of the cases. Common local symptoms were pain (37%), swelling (26%), redness (17%), and numbness (13%). Significant envenomation occurred in 11 patients, whereby antivenom were given (monovalent n=8, polyvalent n=3), without adverse effects observed. 31 patients were discharged from the Emergency Department after a brief observation period. The average length of hospital stays for patients who received snake anti-venom was six days. All patients survived without significant morbidity noted at discharge. No mortality was reported throughout this period.

Majority of snake bites cases in Penang General Hospital were unidentified, followed by vipers and cobras. Antivenom was required in 6% of cases and was well tolerated. All patients did not have any significant morbidity on discharge.

Keywords: Antivenom, Epidemiology, Malaysia, Penang General Hospital, Snake bite

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SEVERE NEUROLOGIC ENVENOMATION FROM UNIDENTIFIED SNAKEBITE IN A PREGNANT WOMAN

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Incidence of snakebites in pregnant patients are rarely reported in the Philippines. Use of anti-venom in pregnant patients is not well studied.

A G6P5 8 weeks AOG woman was bitten by an unidentified snake in the paravertebral aspect of her upper back while doing her laundry. Symptoms started few minutes later. Patient was immediately brought to referring hospital where airway was secured, and resuscitation done. After stabilization, she was rushed to Eastern Visayas Regional Medical Centre where anti-venom was given. The patient significantly improved on the 6th hour post AV administration and was discharged on the 6th hospital day without neurologic deficit upon which nine AV was given in total. Upon transvaginal ultrasonography, a live 8 weeks AOG intrauterine pregnancy was confirmed even after AV administration.

Giving Philippine anti-venom in cobra bites in pregnant patients remain controversial. However, with this case, no adverse reactions to the mother and fetus were reported.

**Keywords:** Anti-venom; Envenomation; Emergency; Pregnancy; Snakebite

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CASE STUDY: DIFFERENTIAL DIAGNOSIS IN A 2-YEAR-OLD IN A LATE PRESENTATION POST SNAKEBITE

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As is for many regions in the world, snakebite in Papua New Guinea (PNG) is an ever-present public hazard, confounded by poor infrastructure, inadequate health facilities and the availability of effective antivenoms. In Central Province, home to the PNG capital Port Moresby, two snakes are responsible for the majority of bites, the Papuan Taipan (*Oxyuranus scutellatus canni*) and the Death Adder (*Acanthophis spp*). The taipan accounts for 83.2% of bites and the death adder 10.8%. Both snakes’ envenomation sequelae produce a descending flaccid paralysis triggered by postsynaptic neurotoxins. However, taipan venom is also rich in a phospholipase A2 neurotoxin (Taipoxin), which also causes a descending paralysis but via enzymatic activity on the terminal bulbs at the presynaptic neuromuscular junction. The venom also has a prothrombin activator which triggers a venom induced consumption coagulopathy.

The following is a differential diagnosis of a 2-year-old female who presented with advanced stages of flaccid paralysis approximately 20 hours after a witnessed snakebite. Here initial WBCT 20 is negative and the ELISA snakebite test is also negative. Which snake is responsible? Which antivenom should be administered?

Post synaptic neurotoxins typically respond well to the administration antivenom and/or the use of an anticholinesterase such as neostigmine. PLA2 on the other hand do not respond to antivenom when administration has been delayed by a few hours. Is she going to be one of the snakebite victims that’s responsible for 45% of ICU admissions, and accounts for 60% of all ventilated-bed days?

**Keywords:** Antivenom; Death Adder; Neurotoxin; Snakebite; Taipan

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Spiny venomous fish exist throughout coastal tropical and subtropical regions worldwide. The most venomous appears to be the stonefish, *Synanceia spp*, with the lionfish, *Pterois volitans*, also being found widely and being regarded as an invasive species in some parts of the world. Many less venomous spiny fish also exist. The predominant venom effect is immediate, severe pain, but soft tissue effects, sometimes including tissue necrosis, are also usual. Severe envenomation can also cause delirium and cardiovascular effects. In Australia, Commonwealth Serum Laboratories (CSL)/Seqirus, produce an equine stonefish antivenom which is available in most coastal hospitals in regions where fish envenomations occur. Although this antivenom is recommended for the treatment of stonefish envenomation alone, the presenter is accumulating experience in using this antivenom effectively and safely for the treatment of envenomation by several other local venomous species, including some which also occur beyond the shores of Australia. One key feature of successful treatment seems to be the use of a dose of antivenom above that recommended by CSL. Key indicators for its use will be presented. While the antivenom is currently used only in Australia and occasionally in Papua New Guinea, it may be useful in other parts of the world where fish envenomation is relatively common. Additionally, there may be a place for improving the antivenom, including broadening its specificity.

**Keywords:** Antivenom; Clinical effects; Envenomation; Venomous fish

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OP12

AUSTRALASIAN SNAKE BITE IN INDONESIA

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The Wallace line is a faunal boundary line which Alfred Russel Wallace proposed as an ecological boundary between Australasian and East Asian species in 1859. West Papua and numerous small islands represent Indonesian landmass to the east of this line, which includes the Lombok Strait, and hence are expected to contain Australasian species. The major species of danger to humans will be presented, including their major clinical effects. Unfortunately, the key to successful management of envenomation, antivenom, produced in Australia by CSL/Seqirus, is expensive and is mostly not available in these parts of Indonesia. In the presenter’s brief experience from Jayapura, medical practitioners seem to know little of the optimal management of such envenomations and seem to see a surprisingly small number of cases, in contrast to the mainland of Papua New Guinea (PNG), just over the border. Possibly the indigenous people are aware that presenting to hospital after a snakebite may be of little value. This relatively neglected area of Indonesia may be hiding many snakebite envenomations and deaths. Thorough research into snake distributions, human bites, envenomations and deaths is needed to accurately delineate the injury and illness burden there. One new, very effective monovalent antivenom has recently completed Phase 3 testing in PNG and may be available in the future for use in eastern Indonesia, depending on the demand. It has several advantages over the CSL equivalent, likely expressing some of the more recent advances in antivenom production.

Keywords: snake bite, West Papua, research, antivenom

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Snakebite envenoming is a neglected tropical disease which cause considerable morbidity and mortality worldwide. Population in predominantly poor rural communities who have limited options to seek health care and may have poor health-seeking behaviour are the most vulnerable. This report will describe two snakebite cases with different initial management and outcome.

The first case is a 79-year-old male who was admitted to ER 4 hours after being bitten by a Malayan pit viper (MPV). The patient was given traditional concoction and then taken to ER by a borrowed vehicle. He showed local and extensive systemic symptoms. Appropriate management was performed and antivenom was administered. Fifteen minutes after admission, he suddenly lost consciousness and developed triad of Cushing. Patient deceased 8 hours after admission because of presumed ICH. The second case is a 54-year-old male who was bitten by another MPV. His bitten limb was first immobilized at the primary health facility. He was taken to ER by EMS ambulance and admitted 2 hours after the bite. The patient only showed local symptoms, but the laboratory results exhibited no coagulation. After antivenom therapy, the coagulation profile improved steadily, the local manifestations diminished and he was moved to high care unit.

Delays in antivenom administration due to traditional first aid measures and unavailability of vehicle contribute to morbidity and mortality of snakebite envenoming.

**Keywords:** envenomation, first aid, pit viper, snakebite

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SHORTLISTED
FREE PAPER PRESENTATION
(Poster)
A case of a 48-year-old male fisherman who presented with dyspnea one hour after ingestion of puffer fish. In transit to local district hospital, patient went into arrest but was revived. Thereafter, patient was transferred to Vicente Sotto Memorial Medical Center and was managed with gastric lavage and Neostigmine.

Known to be the second most poisonous vertebrate in the world, and containing one of the most toxic substances known, tetrodotoxin, the puffer fish is lethal as it is a delicacy. Some features of poisoning include dysphagia, nausea, vomiting, abdominal pain, hypotension, cardiac arrhythmias, and muscle paralysis. Death is due to respiratory and cardiovascular failure. Diagnosis is mainly from the signs and symptoms and a positive history of puffer fish consumption. There is no antidote and management remain symptomatic and supportive. Patients surviving for more than 24 hours have good chances of recovery.

Keywords: Butete; Puffer Fish; Tetrodotoxin

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CHIRODROVIC-TYPE LESION'S MIMICRY: WHEN IT IS NOT ON HELL FIRE!

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Lahad Datu Coastal water are inhibited by deadly venomous box jellyfish species, Chinorex spp. Following stung, it causes different magnitude of envenoming syndrome, but all share common presentation, which is chirodropid type – tentacles lashes’ skin lesion associated with intense burning pain. This finding confuses junior doctors with little experience in managing marine animal envenoming. This case highlights about echinoderms envenoming by Ophiolepsis sp which is initially mistaken for box jellyfish stings.

A 10-year-old non-Malaysian boy was stung by an unidentified marine animal while swimming at Pantai Lamag, Lahad Datu. Following stung, he was immediately attended by his uncle who manage to catch a glimpse of the creatures. He poured vinegar and put tourniquet above the stung area and immediately rushed him to Hospital. Unfortunately, he was not around during the initial evaluation of patient. He was haemodynamically stable although tachycardic. The pain score at the stung area was 10. There were multiple dark grey coloured-shoe laces-like lesion on his distal right anterior forearm, extending laterally and posteriorly associated with swelling and redness of surrounding lesion. The pain was not relieved with Tablet Paracetamol 500mg and Intravenous Tramadol 25mg. Upon clarification of history and identification of species, he was treated with hot water immersion and the pain subsides.

Proper history with correct interpretations of clinical findings and early consultation with expert in managing marine animal envenomation are crucial. Hot water immersion is effective for pain control due to Ophiolepsis sp sting.

Keywords: Brittle star, Clinical Toxinology, Echinoderm, Envenomation

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PP03

“I’M HAVING CHEST PAIN AND CAN’T BREATHE”: AN ANAPHYLACTIC REACTION POST-JELLYFISH STING?

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Anaphylactic shock is an acute life-threatening reaction with varied mechanisms and clinical presentations. Rapid initial and subsequent interventions carry a high success rate in patient outcomes. For these reasons, early diagnosis will help the healthcare provider initiate the necessary treatment in a timely manner.

An eighteen-year-old boy was brought in by coast guard to the emergency department been stung by a jellyfish while swimming. After getting stung, he started to complain of severe pain and numbness. The team noted the patient had dyspnoea, tachycardia, abdominal pain, and generalized joint pain. With further examination, it was noted the patient had urticaria, pruritic rash on the trunk, and mild uvula swelling. Adrenaline, antihistamines, corticosteroids, and nebulization were administered. The patient responded to the treatment and was admitted for observation in the probable event of developing a biphasic reaction.

Early detection of anaphylaxis signs and symptoms is important, as it would help initiate early treatment. Anaphylaxis is a serious and potentially life-threatening condition that requires immediate diagnosis and treatment.

Keywords: Anaphylaxis, Emergency, Jellyfish, Shock, Treatment

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NON-INVASIVE VENTILATION FOR ACUTE RESPIRATORY FAILURE FROM SNAKE BITE ENVENOMATION

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Snake bite are relatively common in the tropics and acute respiratory failure (RF) due to neurotoxicity is one of its known complication. We present a case of acute RF secondary to unidentified snake bite with non-invasive ventilation (NIV) use for respiratory support.

A 41 years old male presented to Emergency Department 3 hours after bitten by an unidentified snake at left hand. He complained of double vision, vomiting and difficulty in breathing. He was able to swallow and there was no large muscle paralysis. Bilateral ptosis were present. His Glasgow coma (GCS) score was 15, blood pressure was 140/90mmHg with heart rate of 110 beats per minute. He was tachypnoeic with respiratory rate of 25 breathe per minute with paradoxical diaphragmatic movement. Other physical examinations were unremarkable. Arterial blood gases were normal. He was started on NIV and received neuro-polyvalent snake antivenom infusion over one hour. After 4 hours, his condition improved and weaned of NIV. He was admitted for observation and discharged well.

The use of NIV in acute neuromuscular RF paralysis is highly controversial. Indication to start on NIV depends on the severity of RF, GCS and the availability of specific reversal therapy. Early administration of antivenom rapidly reversed the underlying pathology. In this case, NIV likely bridged the time between administration of antivenom and its onset of action and eventually avoiding tracheal intubation. Others have reported to extubate patient with RF at about14 hours post antivenom use and another had stated successfully avoided intubation in similar cases.

Keywords: Acute Respiratory Failure; NIV; Snakebite

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SEIZURES IN OUTPATIENT CLINIC FOLLOW UP:
AN UNUSUAL NEUROLOGICAL MANIFESTATION AFTER SNAKEBITE
ENVENOMATION TREATMENT

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Neurological manifestations can result from neurotoxic or non-neurotoxic effects of
snakebite. Delayed neurological manifestation is rarely reported and may endangered patient’s
life.

A 23-year-old male presented in emergency with history of body ache, jaw stiffness
and swallowing pain. He has been bitten by a snake in his right thumb six and half hours prior
to arrival. The patient has been brought to nearest health facility and received injection of
antivenom. In the emergency, vital signs and laboratory investigations were unremarkable. He
was given tetanus toxoid and supportive treatments. One hour after arrival in the ICU, patient
has respiratory failure. Endotracheal intubation was performed, and he was mechanically
ventilated. Patient was in the ICU for ten days, showed no sign of any other neurological
abnormalities and discharged in satisfactory condition. On tenth day after discharged,
outpatient clinic follow-up found seizure symptom told by patient’s family. It was generalized
type seizure, with ten to thirty seconds each seizure periods. Convulsion persisted for next three
months. Patient was given 100 mg of phenytoin tablets twice a day for the first two months and
changed to 100 mg once per day for the third month treatment. The seizures have stop
completely when patient came on his fourth visit.

Seizure may be caused by hypoxia or metabolic cause. Possibility of neurological
damage should be considered in snakebite accompanied with respiratory failure. Further
examination should be done, and it may prevent further damage caused by upcoming
complication like seizure.

Keywords: Neurotoxicity; Respiratory Failure; Seizure; Snakebite

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RE-ENVENOMATION COAGULOPATHY: A CASE REPORT

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Coagulation abnormalities following snake bite have been regarded as short-lived. Rarely reported deranged coagulation profile persistent beyond 8 days of treatment for envenomation. We report a case of a man with unidentified snake bite with re-envenomation coagulopathy. A review of literature reveals very limited cases has been reported. We would like to address the diagnostic challenge as patient and healthcare providers both having difficulty to recognize type of snake involved.

While walking in front of his house, surrounded by paddy field, a 24 years old man was bitten by a snake. Patient describes snake as brown snake with triangular head, which later identified by patient with aid from snake gallery as Malayan Pit Viper. Patient was bitten over medial aspect of left ankle and followed by another bite over dorsal aspect of right fifth toe. Patient sustained swelling over left ankle and right fifth toe. Swelling later progress to left upper calf. With initial suspicion and local envenomation, patient was treated with 4 vials of Calloselasma rhodostoma antivenom without any complication and patient was progressing and ambulating well in ward. Initial investigation was normal. However, concern was raised after 3 days as patient develops thrombocytopenia and coagulopathy (PT >120sec, APTT>180sec, INR not readable, with platelet 107). Coagulopathy lasted for 6 days. Diagnosis was revised as unidentified snakebite with systemic envenomation. Case was consulted with experts, further decision was to administer 3 vials of haemato-polyvalent antivenom with reserving suspicion of other type of viper in view of geographic location near to paddy field, rivers and mangrove swamps. Post haemato-polyvalent antivenom 17 hours, coagulation profiles and platelet has normalised. Patient was allowed discharge with 48 hours follow up consultation.

Re-envenomation coagulopathy highlights the need of serial blood investigation and adequate observation period. Ambulization may lead to local to lymphatic spread causing systemic envenomation. Depot effect need to be considered by healthcare provider, whether further dose of antivenom is required.

Keywords: Antivenom; Coagulopathy; Compartment syndrome; Recurrence; Snakebite

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A BRUISE IS A LESSON

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The state with the highest number of snakebite cases was Kedah. Bites by venomous snakes can cause local and/or systemic envenomation that can result in a life-threatening medical emergency. We presented a case of delayed presentation of pit viper bite presented with altered mental status and coagulopathy.

A 63 years old lady presented to our hospital a week post bitten by pit viper bite over left foot at home. She developed deterioration in the level of consciousness and fever 1 day before attending hospital. There was history of district hospital visit which she was discharge against medical advice. She was unable to ambulate since then and her left leg swelling worsened. The left leg swelling increased in size associated with blackish discolouration and discharged from fang mark site. On arrival, there were multiple bruises also noted over right leg and hands. She was hypotensive and anaemic, thrombocytopenic and there was evidence of coagulopathy. Patient was treated immediately with three vials of monovalent antivenom Malayan pit viper. CECT brain demonstrated multifocal infarct. Then, she was transfused with two pints of packet cell and a cycle of DIVC regime. She completed five days of IV Tazocin and was discharged well.

The positive results of the present case report confirm an empirical concept: a delayed time to treatment should in no way contraindicate the use of antivenin immunotherapy. Antivenin administration should be considered in patients with envenomation complicated by marked and progressive local signs, delayed systemic signs and laboratory abnormalities more than 24 h after envenomation. The key treatment of snakebites, although in this case was already 1 week, is still antivenom.

Keywords: Antivenom; Coagulopathy; Ecchymosis; Hematotoxin; Snakebite.

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UNWITNESSED SNAKE BITE IN CHILDREN - A CHALLENGE IN DIAGNOSIS AND MANAGEMENT: AN ILLUSTRATIVE CASE REPORT

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The clinical diagnosis of a snake bite is critical, particularly in Southeast Asia where venomous snakebites are a public health concern. Additionally, cases involving unwitnessed snake bite with no species identification, especially in non-verbal children posed as a challenge in the emergency setting.

A 2-year old boy presented to our emergency department with signs of neurotoxicity. He was restless and bradypnea with the respiratory rate of 28 breaths per minute, narrowly escaping endotracheal intubation. He also had bilateral ptosis and absent gag reflex. There was a faint bite mark noted over the medial aspect of his left ankle with local swelling and bruises, despite no history of animal bite. A high index of suspicion of neurotoxic envenomation was prompted and a total of 6 vials of neuro-polyvalent anti-venom were administered in scheduled batches. Progressive clinical recovery was subsequently observed after the first batch of anti-venom administration. The wound required debridement under anaesthesia revealing necrotizing fasciitis of the left ankle which gradually recovered with 10 days of high dose intravenous Cefuroxime and proper wound dressing. He was transferred out to general care after 3 days and was discharged well after 10 days of admission.

The case illustrated the importance of clinical recognition of neurotoxic envenomation in the absence of snake bite history or species identification. Early administration of antivenom may potentially reverse the neurotoxic effects of systemic envenomation and saves lives.

Keywords: Antivenins; Child; Respiratory Insufficiency; Snakebites

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A LETHAL THORN IN ONE’S FLESH: A CASE OF NEUROTOXIC SNAKEBITE ENVENOMATION IN REGION III PHILIPPINES

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Snakebite is one of the most neglected tropical disease. Many snakebite cases were treated improperly due to lack of skills regarding specie classification and proper management, as a result the morbidity and mortality rate has always been high. A data from the U.S Naval Medical Research revealed that envenomation from *Naja philippinensis* is a common cause of death among rice farmers in the Philippines. This study emphasizes the relevance of acquiring enough knowledge in determining a venomous and a non-poisonous bite using syndromic approach, which is beneficial in treating such tropical disease.

This is the case of a 45 years old male, farmer came to emergency room allegedly bitten by a snake four hours prior to admission. Upon arrival, primary survey done there was noted subtle fang marks on his lateral aspect of the right leg with no spontaneous breathing and unconscious, emergency intubation and supportive management was initiated. Thereby classifying the patient case as snakebite with signs of severe envenomation and started anti-venom administration. Three hours after administering the anti-venom there were noted involuntary movement of lower extremities. The patient made a remarkable recovery and was discharged without any sequelae after five days of hospital admission.

Thus, the significance of experience and knowledge in snake identification with the proper recognition of the different clinical syndrome of envenomation is clearly undeniable. It is evident that syndromic management must be implemented to help in classifying the specie. Philippines cobra envenomation must be considered in case when neurological symptoms are present. Timely anti-venom administration together with supportive management are essential in such cases.

**Keywords:** Envenomation, Morbidity; Mortality; *Naja philippinensis*; Syndromic approach

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