15th Asia Pacific Medical Association of Medical Toxicology International Scientific Conference
“A Toxicologist’s Rendezvous - Meeting of the Disciplines”
17-20 November 2016
Tan Tock Seng Hospital, Singapore
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Dr. Dora CHEONG

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Dr. Wui Ling CHAN, Singapore
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Dr. Hock Heng TAN, Singapore
Dr. Gregory CHAM, Singapore
Dr. Gene ONG, Singapore

APAMT REPRESENTATIVES
Prof. Nicholas BUCKLEY
Ms. Lucy SHEFFELBEIN
Prof. Andrew DAWSON
Prof. Indika GAWARAMMANA

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WELCOME MESSAGE - APAMT PRESIDENT

It gives me great pleasure to welcome you all to the 15th scientific congress of the Asia Pacific Association of Medical Toxicology.

Our region is the epicentre of global toxicology for both positive and negative reasons. The global burden of toxicological problems is clearly greatest in our region; by any measure we have the highest rates of envenomation, pesticide poisoning, poisoning deaths and environmental toxicology challenges to deal with. However, this region is also delivering some of the most interesting research and innovative solutions to these problems. This meeting continues to be a regular forum for communication and collaboration within this region and beyond.

It is particularly pleasing to see the ACMT, AACT, and EAPCCT symposia now becoming a regular feature of this meeting, both for the engaging content and the opportunities for building future global collaborations.

The APAMT has limited financial resources, and once again we should be very grateful to both the sponsors and volunteers who have enabled us to still deliver a very exciting program, and facilitate a dozen new and emerging researchers coming to this meeting. Andrew Dawson has chaired the Scientific Committee which has put together a strong and varied program. We have had a wonderful local organising committee led by Dr Wui Ling Chan who have prepared a great social program in a wonderful location. On behalf of the board I offer heartfelt thanks to the organising committee, the scientific committee, the conference organisers, and our local hosting institutions. This year our major sponsors include Syngenta, Society of Emergency Medicine Singapore, Randox Toxicology, and National Poisons Centre New Zealand.

There have been some behind the scenes changes in the APAMT. In particular, from 2017 the APAMT will become a co-sponsor (with AACT, ACMT, EAPCCT) of the leading journal in our field “Clinical Toxicology”. This will provide financial members access to the journal, strengthens the financial position of the society, and provides a forum for us to further raise the profile of the APAMT within the international toxicology community. This is my last few weeks as President and I’d like to sincerely thank Thilini and Lucy, the board, and everyone else who has helped to build the association over my term and the preceding years. I invite you all to attend the annual general meeting to get a more complete update on what’s been happening, and see me handover the reins to Indika for him to start planning the next meeting in Sri Lanka.

Finally, I am very pleased to see in the invited speakers and delegates list that so many familiar faces have registered again this year. For those who are new to the APAMT and medical toxicology I sincerely hope that many of you will be inspired to join our association and keep coming back.

Nick Buckley
President - APAMT
WELCOME MESSAGE - ORGANISING COMMITTEE CHAIR

On behalf of the Toxicology Society of Singapore, I would like to warmly welcome all of you to Singapore and to the 15th International Scientific Conference of the Asia Pacific Association of Medical Toxicology.

This is the first time that the APAMT conference is being held in Singapore. It is a great pleasure to host all our friends and colleagues from all over the world for this meeting. The theme for APAMT 2016 is “A Toxicologist’s Rendezvous – Meeting of the Disciplines”. I hope that all of us will find the next three days a fulfilling and enriching time as we network and share our experiences with one another.

I would like to extend my heartfelt appreciation to the APAMT board, the organising and scientific committee, the Toxicology Society of Singapore, Society of Emergency Medicine in Singapore and Tan Tock Seng Hospital for their kind support and to the generous sponsors for making this conference a successful one. Last but not least, a big thank you to all the delegates who have travelled from afar to join us at this meeting! Wishing all of you a fruitful meeting and an enjoyable stay in our Garden City!

Wui Ling Chan
Organising Committee Chair

WELCOME MESSAGE - SCIENTIFIC COMMITTEE CHAIR

On behalf of the Scientific Committee I would like to welcome all registrants and thank you for your contribution to the 15th Scientific Congress of the Asia Pacific Association of Medical Toxicology (APAMT) in Singapore. The scientific and organising committee have with your help have assembled a stimulating scientific and social program.

The theme of the Congress, “A Toxicologist’s Rendezvous – Meeting of the Disciplines”, reflects upon the important relationship between clinical toxicology and other medical and social disciplines. This relationship is particularly apparent and important in the Asia Pacific region. This year brings together speakers from all parts of the world and provides an opportunity for intellectual exchange and collaborations to address these challenges. I would invite all registrants to take full advantage of the meeting and social functions to increase their understanding of the practice of clinical toxicology throughout the region.

Andrew Dawson
Scientific Committee Chair
GENERAL INFORMATION

Conference Venue
Tan Tock Seng Hospital, Theatrette, Level 1
11 Jalan Tan Tock Seng, Singapore 308433

Registration / Information Counter - Opening Hours
18 November, Friday 7.30am - 5.00pm
19 November, Saturday 8.00am - 6.00pm
20 November, Sunday 8.00am - 4.00pm

Name Badges
Delegates are requested to wear their name badges at all times during the conference for identification purpose and to facilitate admission to conference sessions and meal venues.

Internet Access
Complimentary WiFi access is available for all delegates. WiFi login details can be found at the back of the conference name badges.

Meals
Daily breakfast, tea and lunches will be served at the poster and exhibit area, located at the atrium.

Useful Local Telephone Numbers
Police: 999 Comfort Taxi: 6552 1111
Ambulance: 995 Bus / MRT: 1800 225 5663

Conference Dinner
The conference dinner will take place on 19 November 2016, at the Majestic Bay Seafood Restaurant. If you would like to purchase a dinner ticket, please approach the staff at the information counter to check on availability. Bus for the conference dinner will depart from Tan Tock Seng Hospital at 6.30pm.

Certificate of Attendance
Certificate of attendance will be sent via email to all delegates at the end of the conference.
INFORMATION FOR PRESENTERS

Guidelines for Oral Presenters
Oral presentations for general submission papers and invited lectures will be 15 minutes and 20 minutes long respectively. Time allocated for all presentations will include question and answer (Q&A) session with the audience and will be strictly observed to ensure smooth running of the meeting. There will be a 2 minutes’ notice prior to the end of each presentation.

Speakers Support and Upload Procedure
All presentation slides should be uploaded at the Speakers Counter one day prior to the presentation. For presentations scheduled on 18 November 2016 (Friday), please upload the slides in the respective meeting rooms at least 30 minutes before the start of each session.

Guidelines for Poster Presenters
All posters will be allocated a number and a hanging space and must be hung at the designated area in the atrium. Velcro tapes will be provided for use in mounting of posters.

Please refer to the table below for the daily schedule for mounting and removal of posters.

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Please note that posters which are not removed by the end of the day will be discarded.
ACKNOWLEDGEMENTS

MANY THANKS TO THE FOLLOWING ORGANISATIONS

SUPPORTING INSTITUTION

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**Theatrette**
- Plenary Sessions
- Breakout Sessions

**Conference Room**
- Breakout Sessions

**Atrium**
- Breakfast, Tea & Lunches
- Trade Exhibition
- Poster Exhibition
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Successes and Challenges in Strengthening Poison Control and Prevention in the Asia Pacific Region

Professor Chan is the Director of Prince of Wales Hospital Poison Treatment Centre and Centre for Food and Drug Safety, Faculty of Medicine, the Chinese University of Hong Kong and a consultant physician and clinical pharmacologist of the Prince of Wales Hospital, Hong Kong. Since 1989, he has specialised in drug safety, food safety and clinical toxicology. The Chief Executive of the Hong Kong SAR appointed him a Non-Official Justice of the Peace (as from 1 July 2009) and awarded him the Bronze Bauhinia Star (on 1 July 2013) in recognition of his outstanding services over a long period of time.
Prof. P. GOPALAKRISHNAKONE
Professor of Anatomy
Chairman, Venom and Toxin Research Programme,
Yong Loo Lin School of Medicine, National University of Singapore,
Singapore

Challenges in Natural Toxin Envenomations and Research in Asia Pacific Region

Prof. P. Gopalakrishnakone is presently Professor of Anatomy and Chairman of the Venom and Toxin Research Programme at YLL School of Medicine, National University of Singapore.

He is also a consultant to the Defence Science Organization in Singapore and Adjunct Senior Research Scientist at the Defence Medical Research Institute. He is an Honorary Principal Fellow at the Australian Venom Research Unit, University of Melbourne, Australia.

Professor Gopal's research studies include structure function studies, toxin detection, biosensors, antitoxins and neutralization factors, toxinogenomics and expression studies, antimicrobial peptides from venoms and toxins and PLA2 inhibitors as potential drug candidate for inflammatory diseases.

The techniques he employ include quantum dots to toxinology, computational biology, microarrays and protein chips.

He has more than 160 international publications, 4 books, about 350 conference presentations and 10 patent applications.

He has been an active member of the International Society of Toxinology (IST) for 30 years and the founder President of the Asia Pacific Section of IST, Council member of IST as well as in the editorial board of TOXICON.

His research awards include the Outstanding University Researcher Award from the National University of Singapore (1998); Ministerial Citation, NSTB Year 2000 Award in Singapore; and the Research Excellence Award from the Faculty of Medicine, National University of Singapore (2003). His awards in teaching include, Faculty Teaching Excellence Award 2003/4 & NUS Teaching Excellence Award 2003/4. He also received the Annual Teaching Excellence Award at University Level in 2010 and Faculty level 2010.

He was the President of International Society on Toxinology (I.S.T) till 2012. In July 2014, he was awarded the Emeritus Professorship by NUS in recognition of his sustained contribution in terms of distinguished scholarship and conspicuous service to the university.
Dr. Lau Fei-Lung, Rick is known as one of the pioneers in the development in Emergency Medicine (EM) and clinical toxicology in Hong Kong and Asia.

After obtaining his MBBS degree in 1981 from Hong Kong University, Dr. Lau was trained in internal medicine and EM in United Christian Hospital (UCH) and obtained MRCP (UK) in 1987 and FRCS (A&E) in 1992. He was appointed as consultant in ED in 1993 and became the Chief of service in the Emergency Department of UCH in 1995. He was awarded FHKAM (Emerg Med) as a founding fellow of Hong Kong College of EM (HKCEM) in 1997. He was also awarded FRCP (Edin) in 2003 for his outstanding achievement.

Dr. Lau was vital in the development of the Hong Kong Society of EM since its formation and served as its president from 1996 to 1999. He has been the councilor of HKCEM since its formation, and served as vice-president from 2002 to 2005. On the other hand, Dr. Lau was one of the few founders of Asian Society of EM and was elected as its president from 2004 to 2007.

Noticing the under-development of clinical toxicology in Hong Kong, Dr. Lau trained himself and his team in clinical toxicology in the States and established the Hong Kong Society of Clinical Toxicology in 2005 as the founding president. He was later appointed the founding director of the Hong Kong Poison Information Centre in the same year and established the Toxicology Training Centre in UCH in 2010 providing systematic toxicology training program to local and overseas health care workers. In 2012, he set up a charitable toxicology training fund in HKCEM to sponsor doctors from Greater China to be trained in clinical toxicology in Hong Kong. He is currently a board member of Asian Pacific Association of Clinical Toxicology. In 2016, he helped HKCEM to set up the clinical toxicology board and would chair the board to develop the clinical toxicology fellowship program in Hong Kong.

Dr. Lau had published more than a hundred papers mainly on clinical toxicology, edited many training manuals for EM. His main academic interest is in food & metal poisoning and drug & drunk driving.
KEYNOTE SPEAKERS

Prof. Ashish BHALLA
Department of Internal Medicine,
Post Graduate Institute of Medical Education and Research,
Chandigarh, India

Tox Education in India: What’s Next

Prof. Bhalla works as a Professor in the Department of Internal Medicine, Post Graduate Institute of Medical Education and Research, Chandigarh. He is researching in the fields of Toxicology (acute), Tropical infections and Refractory ascites. Prof. Bhalla has authored over 100 publications.

Prof. Paul DARGAN
Consultant Physician and Clinical Toxicologist,
Guy’s and St Thomas’ NHS Foundation Trust; and
Professor of Clinical Toxicology, King’s College London, UK

Prescription Medicine Misuse in the UK and Europe

Prof. Paul Dargan is a Professor of Clinical Toxicology at King’s College London and a Consultant Physician and Clinical Toxicologist at Guy’s and St Thomas’ NHS Foundation Trust, London. He has an active research and teaching programme with a focus on recreational drug toxicity, new psychoactive substances, prescription medicine misuse and heavy metal toxicity. He has published over 250 peer-reviewed papers and numerous book chapters. He sits on the UK Advisory Council on the Misuse of Drugs (ACMD) and is a Member of the Scientific Committee of the European Monitoring Centre for Drugs and Drugs Addiction (EMCDDA). He is an expert adviser to a number of other bodies including the US Food and Drug Administration (FDA) and the World Health Organisation (WHO).
Prof. Michael EDDLESTON
Professor of Clinical Toxicology and Lister Research Prize Fellow in the Pharmacology, Toxicology and Therapeutics Unit of the University/BHF Centre for Cardiovascular Science, University of Edinburgh, UK

Do OP or Pyrethroid Insecticides Cause Diabetes?

Prof. Michael Eddleston is a Professor of Clinical Toxicology and Lister Research Prize Fellow in the Pharmacology, Toxicology and Therapeutics Unit of the University/BHF Centre for Cardiovascular Science, University of Edinburgh, and Director and Consultant Physician at the National Poisons Information Service – Edinburgh unit, Royal Infirmary of Edinburgh. He trained in medicine at Cambridge and Oxford, with an intercalated PhD at the Scripps Research Institute in La Jolla. While a medical student he became fascinated by self-poisoning in rural Sri Lanka and took a year off to work in two Sri Lankan hospitals and to write the Oxford Handbook of Tropical Medicine. Following basic medical training, he returned to Sri Lanka for four years as a Wellcome Trust intermediate fellow before moving to Edinburgh to complete specialist medical training. His research’s major aim is to reduce deaths from pesticide and plant self-poisoning in rural Asia, a cause of over 350,000 premature deaths each year and the number one global means of suicide. To do this, he performs clinical trials in South Asian district hospitals to better understand the pharmacology and effectiveness of antidotes and community-based controlled trials to identify effective public health interventions. This work is complemented by translational studies of antidotes in minipig models of poisoning in a large animal intensive care facility that he has established in Edinburgh, work with sociologists and anthropologists to understand better the meaning of self-harm, and works with the World Health Organisation to aid implementation.
Prof. Robert S. HOFFMAN
Professor of Emergency Medicine and Medicine Director, Division of Medical Toxicology, New York University School of Medicine
Affiliate Clinical Professor
Department of Clinical Pharmacy Practice, St. John’s University, College of Pharmacy and Allied Health Professions
Attending Physician, Department of Emergency Medicine, Bellevue Hospital Center, USA

From Beer to Hips - Diagnosis and Treatment of Cobalt Toxicity

Prof. Robert S. Hoffman received his MD and completed a 3-year internship and residency in Internal Medicine followed by a Fellowship in Medical Toxicology all at NYU School of medicine. He achieved and maintains Board Certification in Internal Medicine, Medical Toxicology, and Emergency Medicine. In 1989 Dr. Hoffman became the director of the Fellowship in Medical Toxicology at the New York City Poison Center, and in 1994 he became the Director of the New York City Poison Center. In 2014 he became the Director of the Division of Medical Toxicology at NYU School of Medicine. Dr. Hoffman has authored over 250 peer-reviewed publications in various aspects of toxicology. He has been an editor of Goldfrank’s Toxicologic Emergencies for the last 6 editions. He has held offices in all 3 American Toxicology Societies, and is currently the past president of the American Academy of Clinical Toxicology.

Prof. Geoff ISBISTER
Clinician Researcher
University of New Castle, Australia

Laboratory and Bedside Diagnosis in Snakebite

Dr. Isbister is a clinician researcher in clinical toxicology and his research has focused on understanding poisoning and envenoming in patients and undertaking studies to determine the effectiveness of antidotes and antivenoms in treatment of these conditions. He heads the Clinical Toxicology Research Group at the University. He has published over 250 original research publications and holds an NHMRC Senior Research Fellowship as well as being Chief Investigator on an NHMRC Program Grant and an NHMRC Centre for Research Excellence on Translational Venom and Antivenom Research. The benefits of the research include improving our understanding of the pathophysiology of both envenomation and poisoning. Much of his research challenges long held views about the treatment of poisoned and envenomed patients, including whether antivenom works. He has made clinicians re-look at what evidence there is for various treatments and why we use these treatments.
Dr. David WOOD
Consultant Physician and Clinical Toxicologist
Guy’s and St Thomas’s NHS Foundation Trust and King’s Health Partners, London, UK

Use of E-cigarettes to Vape Recreational Drugs and New Psychoactive Substances

Dr. David is consultant physician and clinical toxicologist at Guy’s and St Thomas’ NHS Foundation Trust and King’s Health Partners, London, UK and in clinical toxicology at King’s College London, London, UK. He has a clinical, research and academic interest in the epidemiology and patterns of use of and acute/chronic harms related to classical recreational drugs and novel psychoactive substances (NPS). He has published extensively in this area and co-edited the textbook ‘Novel Psychoactive Substances’ published in 2013. He has established a network of specialist European centres to monitor the acute harms associated with recreational drug/NPS use (the European Drug Emergencies Network (Euro-DEN)), which continues as the Euro-DEN Plus project. He is a co-opted member of the UK Advisory Council on the Misuse of Drugs and expert advisor to the European Monitoring Centre for Drugs and Drug Addiction.

Dr. Chen-Chang YANG
Professor & Chair, Institute of Environmental & Occupational Health Sciences, School of Medicine, National Yang-Ming University, Taipei, Taiwan) and Attending Physician & Chief, Division of Clinical Toxicology & Occupational Medicine, Department of Medicine, Taipei Veterans General Hospital, Taipei, Taiwan

Cardioactive Steroids Related Poisoning in Taiwan

Professor Chen-Chang Yang, MD, MPH, DrPH, is currently the Chair of Environmental & Occupational Health Sciences at the School of Medicine, National Yang-Ming University, Taiwan. He is also the Chief of the Division of Clinical Toxicology & Occupational Medicine at the Department of Medicine, Taipei Veterans General Hospital, Taiwan and the Director of the National Poison Control Center in Taiwan. His research activities mainly focus on clinical toxicology, toxicoepidemiology, and pharmacoepidemiology. He is a regular speaker at national and international conferences and has published more than 100 peer-reviewed papers in international scientific journals.
INVITED SPEAKERS

Prof. Nicholas BUCKLEY
University of Sydney, Australia

Multiple Choices for Multiple Choices (Free internet-based Educational Software)
The Interactive Toxic Challenge

Dr. Michele BURNS
Harvard Medical Toxicology Fellowship/ Boston Children’s Hospital, USA

Ketamine and Analogs Toxicity

Dr. Betty CHAN
Prince of Wales Hospital, Australia

Cardiac Glycosides: How to Optimize Anti-digoxin Fab Fragments?

Dr. Joanne Sheot Harn CHAN
Health Sciences Authority, Singapore

An Overview of Toxins and Toxicants in Our Foods

Dr. Wui Ling CHAN
Tan Tock Seng Hospital, Singapore

Prescription Medicine Misuse in Asia

Dr. Chulathida CHOMCHAI
Siriraj Hospital, Mahidol University, Thailand

The Diversification of Medications in Thai Adolescents, Will We Ever Catch Up

Prof. Andrew DAWSON
Royal Prince Alfred Hospital, Australia

Wikitox Course by Distance
INVITED SPEAKERS

Prof. Indika Bandara
GAWARAMMANA
University of Peradeniya, Sri Lanka
Snakebite and Antivenom Development

Dr. Sophie GOSELIN
Centre Antipoison du Québec & McGill University Health Centre, Canada
Multiple Faces of Ketamine; Toxin or Treatment?
Ketamine Analgesia in Pain Management
Dialysis in the Poisoned Patient - When, Who and How

Dr. Shaun GREENE
Victoria Poisons Information Centre, Australia
Recognition and Management of Over the Counter Medicine Abuse

Dr. RJ HOFFMAN
Sidra Medical and Research Center, Qatar
Outsourcing Toxicology Education - What Are The Options?
Agitated Delirium: Where Does Ketamine Fit In?
Withdrawal Syndrome Managements
From Beer to Hips - Diagnosis and Treatment of Cobalt Toxicity

Prof. Robert HOFFMAN
NYU School of Medicine, USA

Dr. Knut Erik HOVDA
Norwegian CBRNE Centre of Medicine, Norway
Toxic Alcohol Poisoning: Should We Use Ethanol or Fomepizole?
INVITED SPEAKERS

**Dr. Ahmad Khaldun ISMAIL**  
Universiti Kebangsaan Malaysia Medical Centre, Malaysia  
Remote Envenomation Consultation Service - The Malaysian Experience

**Dr. Thanjira JIRANANTAKAN**  
Siriraj Hospital, Mahidol University, Thailand  
Venomous Spiders in Thailand: New Discovery and Paradigm Shift in Network and Collaborations

**Prof. Hwee Ling KOH**  
National University of Singapore, Singapore  
Adulteration in Botanical Products

**Dr. Weng Keong LOKE**  
Defence Medical & Environmental Research Institute, DSO Laboratories, Singapore  
Management of Nerve Agents Poisoning - Role of Field Triage Kit and Field Administered Antidotes

**Dr. Yen-Chiao MAO**  
Taichung Veterans General Hospital, Taiwan  
Glufosinate Herbicide Poisoning - A Review

**Prof Bruno MÉGARBANE**  
Paris-Diderot University, France  
Refractoriness of Poisoning with Cardiototoxicants to Antidotes: Definition and Management?  
Extracorporeal Life Support in Toxicology - What is the Evidence and When Should It be Used
### INVITED SPEAKERS

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<td>KK Women’s and Children’s Hospital, Singapore</td>
<td>Role of High Fidelity Simulation in Toxicology Teaching</td>
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<td>Pastoor Science Communications, USA</td>
<td>Toxicity, Risk, and Decisions: What the Clinician Needs to Know About Pesticides</td>
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<td>Dr. Darren ROBERTS</td>
<td>Royal Prince Alfred Hospital and NSW Poisons Information Centre, Australia</td>
<td>Novel Antidotes for Amanita Ahalloides Poisoning</td>
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<td>Dr. Satariya TRAKULSRICHAI</td>
<td>Ramathibodi Hospital, Mahidol University, Thailand</td>
<td>Challenges of Environmental Lead Poisoning in Children</td>
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<td>Hong Kong Poison Information Centre, Hong Kong</td>
<td>New Mushroom Poisoning Syndrome in China</td>
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<td>Victorian Poisons Information Centre and Austin Toxicology Service, Australia</td>
<td>Updates on the Global Educational Toxicology Uniting Project (GETUP) &amp; The Global Educational Toxicology Toolkit (GETKIT)</td>
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<td>Prince of Wales Hospital Poison Treatment Centre, Australia</td>
<td>Herbal Treatment and Sub-acute Arsenic Poisoning - Vigilence, Management and Lesson Learnt</td>
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## INVITED SPEAKERS

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DRUG TESTING HAS CHANGED FOREVER

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<tbody>
<tr>
<td>8.00am</td>
<td>Registration and Breakfast</td>
</tr>
<tr>
<td>8.30am</td>
<td>Opening Ceremony</td>
</tr>
</tbody>
</table>
| 9.00am | APAMT Fellowship Lecture: Successes and Challenges in Strengthening Poison Control and Prevention in the Asia Pacific Region  
                     Prof Thomas Y.K. CHAN  
                     The Chinese University of Hong Kong |
| 9.45am | Session 1A - Agrochemical Toxicity  
                     Session Chair: Ravindra FERNANDO |
|        | Session 1B - Free Paper Session  
                     Session Chairs: Fahim CADER & Gregory CHAM |
| 10.45am| Morning Tea Break @ Atrium                                           |
| 11.15am| Session 2A - Toxicology of Recreational Drugs  
                     Session Chairs: Wui Ling CHAN & Man Li TSE |
|        | Session 2B - Free Paper Session Agrochemicals 1  
                     Session Chairs: Hossein HASSANIAN-MOGHADDAM & Adeline NGO |
| 12.30pm| Lunch and Poster Session 1                                           |
| 2.00pm | Session 3A - American Academy of Clinical Toxicology Symposium  
                     Session Chair: Sophie GOSSELIN |
|        | Session 3B - Free Paper Session Agrochemicals 2  
                     Session Chairs: Winai WANANUKUL & Hock Heng TAN |
| 3.30pm | Afternoon Tea Break                                                  |
| 4.00pm | Session 4A - Regulatory Toxicology/Industry  
                     Session Chairs: Yi Ju YAO & Thanjira JIRANANTAKAN |
|        | Session 4B - Predictive Toxicology/Environmental  
                     Session Chairs: Gayatri SANKARAN & Andrew DAWSON |
<p>| 5.00pm | End of Day 1 Programme                                               |</p>
<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>8.00am</td>
<td>Registration and Breakfast</td>
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</tbody>
</table>
| 8.30am | Plenary: Challenges in Natural Toxin Envenomations and Research in Asia Pacific Region  
        Prof. P. GOPALAKRISHNAKONE   
        Yong Loo Lin School of Medicine, National University of Singapore |
| 9.15am | Session 5A - Natural Toxicology  
        Session Chairs: Gregory CHAM & Abul FAIZ                          |
|        | Session 5B - Free Paper Session  
        Session Chairs: Ashish BHALLA & Betty CHAN                        |
| 10.30am| Morning Tea Break                                                       |
| 11.00am| Session 6A - European Association of Poisons Centres and Clinical Toxicologists Symposium - Antidotes  
        Session Chair: Paul DARGAN                                        |
|        | Session 6B - Free Paper Session - Natural Toxin 1  
        Session Chairs: Chen-Chang YANG & Yi Ju YAO                         |
| 12.15pm| Lunch and Poster Session 2                                              |
| 1.45pm | Session 7A - Mushroom Poisoning in Asia  
        Session Chairs: Feng Deng JOU & Darren ROBERTS                    |
|        | Session 7B - American College of Medical Toxicology Symposium - Educational Track  
        Session Chair: Kent OLSON                                           |
| 3.30pm | Afternoon Tea Break                                                    |
| 4.00pm | Session 8A - Traditional Medicine Toxicology  
        Session Chairs: Dong Haur PHUA & Fei Lung Rick LAU                |
|        | Session 8B - Free Paper Session - Natural Toxin 2  
        Session Chair: Nick BUCKLEY                                        |
| 5.00pm | End of Day 2 Programme                                                  |
| 5.05pm | Annual General Meeting                                                 |
| 6.30pm | Bus Departs for Conference Dinner at Majestic Bay Seafood Restaurant, Gardens by the Bay  
        (Purchase of ticket is required)                                   |
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>8.00am</td>
<td>Registration and Breakfast</td>
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</tbody>
</table>
| 8.15am | Plenary: Gastric Decontamination in Asia: Beyond the Position Statements  
Dr. Fei Lung Rick LAU  
Hong Kong Poison Information Centre, Hong Kong |
| 9.00am | Session 9A - Society for Emergency Medicine in Singapore Symposium - Toxicology Resuscitation Fast and Furious - You and Your Next Shift  
Session Chair: Rahul GOSWAMI |
|        | Session 9B - Free Paper Session - Poisoning Epidemiology  
Session Chairs: Andrew DAWSON & Gene ONG |
| 10.30am| Morning Tea Break                                                   |
| 11.00am| Session 10A - Mass Disaster Toxicology  
Session Chair: R PONAMPALAM |
|        | Session 10B - Free Paper Session - Dying Near ED  
Session Chairs: David WOOD & Hock Heng TAN |
| 12.40pm| Lunch and Poster Session 3                                           |
| 1.40pm | Session 11A - Prescription Drug Abuse  
Session Chairs: Wui Ling CHAN & Chulathida CHOMCHAI |
| 3.00pm | The Interactive Toxic Challenge  
Nick BUCKLEY |
| 3.45pm | Close of Meeting                                                   |
| 4.15pm | End of Day 3 Programme                                              |
# ORAL PRESENTATION LISTING

## Day 1 - 18 November 2016, Friday

### APAMT Fellowship Lecture: Successes and Challenges in Strengthening Poison Control and Prevention in the Asia Pacific Region

**Thomas Y.K. CHAN**  
**Theatrette**  
9.00am - 9.45am

### Session 1A: Agrochemical Toxicity

**Session Chair - Ravindra FERNANDO**  
**Theatrette**  
9.45am - 10.45am

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>9.45am</td>
<td>1A-01 Do OP or Pyrethroid Insecticides Cause Diabetes?</td>
<td>Michael EDDLESTON</td>
</tr>
<tr>
<td>10.05am</td>
<td>1A-02 Glufosinate Herbicide Poisoning - A Review</td>
<td>Yen-Chiao MAO</td>
</tr>
<tr>
<td>10.25am</td>
<td>1A-03 Mitochondrial Toxicity in Agrochemical Poisoning</td>
<td>Ashish BHALLA</td>
</tr>
</tbody>
</table>

### Session 1B: Free Paper Session

**Session Chairs - Fahim CADER & Gregory CHAM**  
**Conference Rm**  
9.45am - 10.30am

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>9.45am</td>
<td>1B-01 Effective Use of Social Media in Awareness Development and Management of Snakebite in Bangladesh</td>
<td>Chowdhury FORHAD UDDIN HASAN</td>
</tr>
<tr>
<td>10.00am</td>
<td>1B-02 Facebook, Factsheets and Phone Calls: The Impact of a Dedicated Toxicovigilance Position on Poisoning Prevention and Calls to an Australian PIC</td>
<td>Genevieve ADAMO</td>
</tr>
<tr>
<td>10.15am</td>
<td>1B-03 ‘Living with the Enemy’: From Classroom to Real Situation</td>
<td>Asdariah MISNAN</td>
</tr>
</tbody>
</table>

### Session 2A: Toxicology of Recreational Drugs

**Session Chairs - Wui Ling CHAN & Man Li TSE**  
**Theatrette**  
11.15am - 12.30pm

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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</thead>
<tbody>
<tr>
<td>11.15am</td>
<td>2A-01 Use of E-Cigarettes to Vape Recreational Drugs and New Psychoactive Substances</td>
<td>David WOOD</td>
</tr>
<tr>
<td>11.35am</td>
<td>2A-02 Abuse and Detection of New Psychoactive Substances in Singapore</td>
<td>Yi Ju YAO</td>
</tr>
<tr>
<td>11.55am</td>
<td>2A-03 The Diversification of Medications in Thai Adolescents, Will We Ever Catch Up</td>
<td>Chulathida CHOMCHAI</td>
</tr>
<tr>
<td>12.15am</td>
<td>2A-04 Clinical Audit Questions Cannabis Hyperemesis Syndrome</td>
<td>Mike MCDONOUGH</td>
</tr>
</tbody>
</table>
### Session 2B: Free Paper Session Agrochemicals 1
Session Chairs - Hossein HASSANIAN-MOGHADDAM & Adeline NGO

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<tr>
<th>Time</th>
<th>Presentation</th>
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<th>Presenter</th>
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<tbody>
<tr>
<td>11.15am</td>
<td>2B-01</td>
<td>Preventing Pesticide Suicides by Restricting Access from Shops - Exploratory and Pilot Studies</td>
<td>Manjula WEERASINGHE</td>
</tr>
<tr>
<td>11.30am</td>
<td>2B-02</td>
<td>Relationship Between Alcohol Co-Ingestion and Outcome in Profenofos Self-Poisoning - A Retrospective Case Series</td>
<td>Dhanarisi HEWA KALUKAPUGE JEEVAN</td>
</tr>
<tr>
<td>11.45am</td>
<td>2B-03</td>
<td>Effects of Lipid Emulsion on Hemodynamics in Organophosphate Compound Poisoning</td>
<td>Ashish BHALLA</td>
</tr>
<tr>
<td>12.00pm</td>
<td>2B-04</td>
<td>A Pilot Study to Evaluate the Use of the Triple Cholinesterase Test in Organophosphorus Poisoning</td>
<td>Suresh SANDHYA</td>
</tr>
<tr>
<td>12.15pm</td>
<td>2B-05</td>
<td>Extrapyramidal Effects of Acute Organophosphate Poisoning</td>
<td>Reji KENT</td>
</tr>
</tbody>
</table>

### Session 3A: American Academy of Clinical Toxicology Symposium
Session Chair - Sophie GOSSELIN

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<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Title</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>2.00pm</td>
<td>3A-01</td>
<td>Multiple Faces of Ketamine: Toxin or Treatment?</td>
<td>Sophie GOSSELIN</td>
</tr>
<tr>
<td>2.20pm</td>
<td>3A-02</td>
<td>Agitated Delirium: Where Does Ketamine Fit in?</td>
<td>Robert HOFFMAN</td>
</tr>
<tr>
<td>2.40pm</td>
<td>3A-03</td>
<td>Ketamine Analgesia in Pain Management</td>
<td>Sophie GOSSELIN</td>
</tr>
<tr>
<td>2.55pm</td>
<td>3A-04</td>
<td>Ketamine and Analogs Toxicity</td>
<td>Michele BURNS</td>
</tr>
<tr>
<td>3.10pm</td>
<td>3A-05</td>
<td>Withdrawal Syndrome Managements</td>
<td>Robert HOFFMAN</td>
</tr>
</tbody>
</table>

### Session 3B: Free Paper Session - Agrochemicals 2
Session Chairs - Winai WANANUKUL & Hock Heng TAN

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<tr>
<th>Time</th>
<th>Presentation</th>
<th>Title</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>2.00pm</td>
<td>3B-01</td>
<td>BROMOXNIL or MCPA - The Toxic Ingredient</td>
<td>Betty CHAN</td>
</tr>
<tr>
<td>2.15pm</td>
<td>3B-02</td>
<td>Neurocognitive Changes in Survivors of Aluminium Phosphide Poisoning in Acute Phase and Follow up till 3 Months</td>
<td>Ashish BHALLA</td>
</tr>
<tr>
<td>2.30pm</td>
<td>3B-03</td>
<td>Reducing Cell Macromolecule Damage Protects Rats Against Monocrotophos Induced Type 1 Paralysis</td>
<td>Sivamani POORNIMA</td>
</tr>
<tr>
<td>2.45pm</td>
<td>3B-04</td>
<td>Cholinesterase Enzyme Reactivation and Brain Mitochondria Protection by Quercetin and Rutin in Acute Poisoning by Diazinon in Mice</td>
<td>Hamidreza MOHAMMADI</td>
</tr>
<tr>
<td>3.00pm</td>
<td>3B-05</td>
<td>Clinical Outcome of Paraquat Poisoning During Pregnancy</td>
<td>Satariya TRAKULSRICHAI</td>
</tr>
</tbody>
</table>
## ORAL PRESENTATION LISTING

### Session 4A: Regulatory Toxicology/Industry
**Session Chairs - Yi Ju YAO & Thanjira JIRANANTAKAN**

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<thead>
<tr>
<th>Time</th>
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<th>Presenter</th>
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<tbody>
<tr>
<td>4.00pm</td>
<td>An Overview of Toxins and Toxicants in Our Foods</td>
<td>Sheot Harn Joanne CHAN</td>
</tr>
<tr>
<td>4.20pm</td>
<td>Overview of Pharmacovigilance in Singapore</td>
<td>Cheng Leng CHAN</td>
</tr>
<tr>
<td>4.40pm</td>
<td>Toxicity, Risk, and Decisions: What the Clinician Needs to Know About Pesticides</td>
<td>Timothy PASTOOR</td>
</tr>
</tbody>
</table>

### Session 4B: Predictive Toxicology/Environmental
**Session Chairs - Gayatri SANKARAN & Andrew DAWSON**

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>4.00pm</td>
<td>From Beer to Hips - Diagnosis and Treatment of Cobalt Toxicity</td>
<td>Robert HOFFMAN</td>
</tr>
<tr>
<td>4.20pm</td>
<td>Challenges of Environmental Lead Poisoning in Children</td>
<td>Satariya TRAKULSRICHAI</td>
</tr>
<tr>
<td>4.40pm</td>
<td>Increased self-poisoning in young Australians: Why, 2Ks?</td>
<td>Rose CAIRNS</td>
</tr>
</tbody>
</table>

### Day 2 - 19 November 2016, Saturday

**Plenary: Challenges in Natural Toxin Envenomations and Research in Asia Pacific Region**
**P. GOPALAKRISHNAKONE**

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<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>8.30am</td>
<td>Laboratory and Bedside Diagnosis in Snakebite</td>
<td>Geoff ISBISTER</td>
</tr>
<tr>
<td>9.15am</td>
<td>Remote Envenomation Consultation Service - The Malaysian Experience</td>
<td>Ahmad Khaldun ISMAIL</td>
</tr>
<tr>
<td>9.55am</td>
<td>Snakebite and Antivenom Development</td>
<td>Indika Bandara GAWARAMMANA</td>
</tr>
<tr>
<td>10.15am</td>
<td>Recovery of Venom Induced Consumption Coagulopathy (VICC) in Russell’s Viper (Daboia russelii) Envenoming: Does Antivenom Play a Role?</td>
<td>Anjana SILVA</td>
</tr>
</tbody>
</table>
## ORAL PRESENTATION LISTING

### Session 5B: Free Paper Session
Session Chairs - Ashish BHALLA & Betty CHAN

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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenter</th>
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</thead>
<tbody>
<tr>
<td>9.15am</td>
<td>5B-01</td>
<td>Liver X Receptor Agonist TO901317 Attenuates Paraquat-induced Acute Lung Injury Through Inhibition of NF-KB and JNK/p38 MAPKs Signal Pathways</td>
<td>Xiao HU</td>
</tr>
<tr>
<td>9.30am</td>
<td>5B-02</td>
<td>Silymarin Attenuates Paraquat-induced Lung Injury via Nrf2-mediated Pathway in vivo and in vitro</td>
<td>Feng ZHAO</td>
</tr>
<tr>
<td>9.45am</td>
<td>5B-03</td>
<td>Antioxidant Therapy on Paraquat Induced Pulmonary Injury; Quantified with Human Clara Cell Protein ELISA</td>
<td>Sudheera JAYASINGHE</td>
</tr>
<tr>
<td>10.00am</td>
<td>5B-04</td>
<td>Changing oleander (Thevetia Peruviana) Poisoning Patterns in Sri Lanka and Novel Risk Factors</td>
<td>Nicholas OSBORNE</td>
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### Session 6A: European Association of Poisons Centres and Clinical Toxicologists Symposium - Antidotes
Session Chair - Paul DARGAN

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11.00am</td>
<td>6A-01</td>
<td>Organophosphate Poisonings: When Should We Use Oximes?</td>
<td>Michael EDDLESTON</td>
</tr>
<tr>
<td>11.20am</td>
<td>6A-02</td>
<td>Toxic Alcohol Poisoning: Should We Use Ethanol or Fomepizole?</td>
<td>Knut Erik HOVDA</td>
</tr>
<tr>
<td>11.40am</td>
<td>6A-03</td>
<td>Cardiac Glycosides: How to Optimize Anti-digoxin Fab Fragments?</td>
<td>Betty CHAN</td>
</tr>
<tr>
<td>12.00pm</td>
<td>6A-04</td>
<td>Refractoriness of Poisoning with Cardiotoxicants to Antidotes: Definition and Management?</td>
<td>Bruno MÉGARBANE</td>
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### Session 6B: Free Paper Session Natural Toxin 1
Session Chairs - Chen-Chang YANG & Yi Ju YAO

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<tbody>
<tr>
<td>11.00am</td>
<td>6B-01</td>
<td>Analysis of the Efficacy of Taiwan Freeze Neurotoxic Antivenom Against Southeast Asia Cobra Venoms through Animal Model and Proteomics Approaches</td>
<td>Chih Chuan LIN</td>
</tr>
<tr>
<td>11.15am</td>
<td>6B-02</td>
<td>Proteomic Characterization of Unique Venom Components and Development of Sandwich Elisa for Diagnosing Clinically Significant Snake Envenomation in Taiwan</td>
<td>Chien-Chun LIU</td>
</tr>
<tr>
<td>11.30am</td>
<td>6B-03</td>
<td>Clinical Spectrum of Snake Envenomation in Tamil Nadu: The Importance of Russell's Viper Envenomation</td>
<td>Abraham GEORGE</td>
</tr>
<tr>
<td>11.45am</td>
<td>6B-04</td>
<td>Epidemiology and Outcome of Snakebites in the Peripheral Hospitals in North Western Province of Sri Lanka</td>
<td>Seyed Ismail Imam SEYED SHAHMY</td>
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## ORAL PRESENTATION LISTING

### Session 7A: Mushroom Poisoning in Asia
Session Chairs - Feng Deng JOU & Darren ROBERTS

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<tr>
<th>Time</th>
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<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>1.45pm</td>
<td>7A-01</td>
<td>New Mushroom Poisoning Syndrome in China</td>
<td>Man Li TSE</td>
</tr>
<tr>
<td>2.05pm</td>
<td>7A-02</td>
<td>Mushroom Poisoning - The Taiwan Experience</td>
<td>Min–Ling WU</td>
</tr>
<tr>
<td>2.25pm</td>
<td>7A-03</td>
<td>Novel Antidotes for Amanita Phalloides Poisoning</td>
<td>Darren ROBERTS</td>
</tr>
<tr>
<td>2.45pm</td>
<td>7A-04</td>
<td>Mushroom Poisoning in Thailand: A 3-Year Retrospective Review of Poison Centers Databases</td>
<td>Thanjira JIRANANTAKAN</td>
</tr>
<tr>
<td>3.00pm</td>
<td>7A-05</td>
<td>Social Determinants of Health, Knowledge, Practice and Awareness of Thai Mushroom Pickers: Face to Face Interviews in 11 Villages</td>
<td>Thanjira JIRANANTAKAN</td>
</tr>
<tr>
<td>3.15pm</td>
<td>7A-06</td>
<td>IV Silibinin (Legalon SIL) for the Treatment of Amatoxin Mushroom Poisoning (AMP) Induced Liver Injury &amp; Fulminant Hepatic Failure (FHF): An Open Label Prospective Uncontrolled Clinical Trial</td>
<td>S Todd MITCHELL MD</td>
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### Session 7B: American College of Medical Toxicology Symposium - Educational Track
Session Chair - Kent OLSON

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<th>Time</th>
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<tbody>
<tr>
<td>1.45pm</td>
<td>7B-01</td>
<td>Role of High Fidelity Simulation in Toxicology Teaching</td>
<td>Gene ONG</td>
</tr>
<tr>
<td>2.05pm</td>
<td>7B-02</td>
<td>GETUP Updates &amp; The Global Educational Toxicology ToolKIT (GETKIT): A One Day Course on Poisoning Management for Developing Countries</td>
<td>Anselm WONG</td>
</tr>
<tr>
<td>2.25pm</td>
<td>7B-03</td>
<td>WikiTox Course by Distance</td>
<td>Andrew DAWSON</td>
</tr>
<tr>
<td>2.40pm</td>
<td>7B-04</td>
<td>Open Access Educational Software</td>
<td>Nick BUCKLEY</td>
</tr>
<tr>
<td>2.55pm</td>
<td>7B-05</td>
<td>Tox Education in India: What’s Next</td>
<td>Ashish BHALLA</td>
</tr>
<tr>
<td>3.10pm</td>
<td>7B-06</td>
<td>Outsourcing Toxicology Education - What Are the Options?</td>
<td>RJ HOFFMAN</td>
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## ORAL PRESENTATION LISTING

### Session 8A: Traditional Medicine Toxicology
**Session Chairs - Dong Haur PHUA & Fei Lung Rick LAU**

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<th>Time</th>
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<th>Speaker</th>
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<tbody>
<tr>
<td>4.00pm</td>
<td>8A-01</td>
<td>Adulteration in Botanical Products</td>
<td>Hwee Ling KOH</td>
</tr>
<tr>
<td>4.20pm</td>
<td>8A-02</td>
<td>Herbal Treatment and Sub-acute Arsenic Poisoning - Vigilance, Management and Lesson Learnt</td>
<td>Raymond WONG</td>
</tr>
<tr>
<td>4.40pm</td>
<td>8A-03</td>
<td>Cardioactive Steroids Related Poisoning in Taiwan</td>
<td>Chen-Chang YANG</td>
</tr>
</tbody>
</table>

### Session 8B: Free Paper Session - Natural Toxin 2
**Session Chair - Nick BUCKLEY**

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<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>4.00pm</td>
<td>8B-01</td>
<td>Venomous Spiders in Thailand: New Discovery and Paradigm Shift in Network and Collaborations</td>
<td>Thanjira JIRANANTAKAN</td>
</tr>
<tr>
<td>4.15pm</td>
<td>8B-02</td>
<td>A Randomized Controlled Trial of Hot Water (45°C) Immersion Versus Ice Packs for the Treatment of Pain in Chironex Fleckeri Stings</td>
<td>Geoff ISBISTER</td>
</tr>
<tr>
<td>4.30pm</td>
<td>8B-03</td>
<td>Histamine Poisoning Due to Insect Ingestion: An Outbreak Investigation from Thailand</td>
<td>Summon CHOMCHAI</td>
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</table>

### Day 3 - 20 November 2016, Sunday

**Plenary: Gastric Decontamination in Asia: Beyond the Position Statements**
**Fei Lung Rick LAU**

<table>
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<tr>
<th>Time</th>
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<th>Speaker</th>
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<tbody>
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**Session 9A: Society for Emergency Medicine in Singapore Symposium - Toxicology Resuscitation Fast and Furious - You and Your Next Shift**
**Session Chair - Rahul GOSWAMI**

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<td>9.00am</td>
<td>9A-01</td>
<td>Bedside Toxicology: What NOT to Do</td>
<td>Chris NICKSON</td>
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<td>9.20am</td>
<td>9A-02</td>
<td>Extracorporeal Life Support in Toxicology - What is the Evidence and When Should It be Used</td>
<td>Bruno MÉGARBANE</td>
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<td>9.40am</td>
<td>9A-03</td>
<td>Dialysis in the Poisoned Patient - When, Who and How</td>
<td>Sophie GOSSELIN</td>
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<td>10.00am</td>
<td>9A-04</td>
<td>Paediatric Toxicology - The Agony and the Ecstacy</td>
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#### Session 9B: Free Paper Session - Poisoning Epidemiology
Session Chair - Andrew DAWSON

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<td>Patterns and Risk Factors of Acute Poisoning Among Children in Rural Sri Lanka</td>
<td>Dayasiri KAVINDA CHANDIMAL</td>
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<td>9.15am</td>
<td>9B-02</td>
<td>Seasonal Variation in Self-Poisoning in Ten Sri Lanka Hospitals</td>
<td>Katharine KIRBY</td>
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<td>9.30am</td>
<td>9B-03</td>
<td>Administration of Over-the-Counter Medication to Children at Home and Accuracy of Oral Liquid Measuring Devices - An observational study</td>
<td>Godakanda Arachchige MANEESHAPRASADI</td>
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<td>9.45am</td>
<td>9B-04</td>
<td>Pattern and Outcome of Patients Admitted with Deliberate Self Harm in Medical Wards over 5 years - A Retrospective Study</td>
<td>Indira MADHAVAN</td>
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<td>Changes in the Population Incidence of Deliberate Self Poisoning in North Western Province of Sri Lanka - Signs for a Decline</td>
<td>Senarathna LALITH</td>
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#### Session 10A: Mass Disaster Toxicology
Session Chair - R PONAMPALAM

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<td>Reviewing A Chemical Warfare Attack Tragedy: Lessons Learnt</td>
<td>Hossein HASSANIAN-MOGHADDAM</td>
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<td>10A-02</td>
<td>Management of Nerve Agents Poisoning: Role of Field Triage Kit and Field Administered Antidotes</td>
<td>Weng Keong LOKE</td>
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<td>10A-03</td>
<td>Methanol Poisoning Diagnosis Made Easy - The Formate Bedside Strips: New Data of a Novel Method</td>
<td>Knut Erik HOVDA</td>
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<td>An Innovative Approach to Handle Outbreaks of Methanol Poisoning</td>
<td>Morten ROSTRUP</td>
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<td>12.15pm</td>
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<td>Chemical Burns: First Aid Regarding Hundred Exposures</td>
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### Session 10B: Free Paper Session - Dying Near ED
**Session Chair:** David WOOD  
**Conference Rm** 11.00am - 12.35pm

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<td>Utilizing QT Corrected by Dmitrienko Formula to Predict Torsades De Pointes from Drug Induced QT Prolongation</td>
<td>Rittirak OTHONG</td>
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<td>11.35am</td>
<td>Utilisation of Poison Centre Advice in Hospitals</td>
<td>Betty CHAN</td>
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<td>The Recovery Rate of Cardiac Enzyme &amp; Systolic Dysfunction After Hyperbaric Oxygen Therapy in Severe CO Intoxication</td>
<td>Hyun KIM</td>
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<td>12.05pm</td>
<td>Obesity: A Risk Factor of Acute Liver Injury from Acute Acetaminophen Overdose</td>
<td>Summon CHOMCHAI</td>
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<td>12.20pm</td>
<td>Cyanide Poisoning in Pre and Post National Antidote Project Era</td>
<td>Sahaphume SRISUMA</td>
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### Session 11A: Prescription Drug Abuse
**Session Chairs:** Dong Haur PHUA & Chulathida CHOMCHAI  
**Theatrette** 1.40pm - 2.55pm

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<td>Paul DARGAN</td>
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<td>Recognition and Management of Over the Counter Medicine Abuse</td>
<td>Shaun GREENE</td>
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<td>Prescription Medicine Misuse in Asia</td>
<td>Wui Ling CHAN</td>
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<td>Comparison of Two Different Regimens of Naloxone in Treatment of Addicted Methadone-Overdosed Patients; A Randomized Controlled Trial</td>
<td>Hossein HASSANIAN-MOGHADDAM</td>
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### The Interactive Toxic Challenge
**Nick BUCKLEY**  
**Theatrette** 3.00pm - 3.45pm
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<td>Thanjira JIRANANTAKAN</td>
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16th Scientific Congress
Asia Pacific Association of Medical Toxicology

7th – 10th November 2017
The Grand Kandyan Hotel
Kandy
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Oral Abstracts

Plenary

SUCCESSES AND CHALLENGES IN STRENGTHENING POISON CONTROL AND PREVENTION IN THE ASIA PACIFIC REGION

Thomas Y.K. Chan

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Learning Objectives:
1. Learn from the experience of Asia Pacific poison control centres, research consortia and clinical toxicologists in poison prevention
2. Recognise the impact of restricted access to pesticides and other high-risk poisons on the incidence of fatal self-poisoning
3. Appreciate the magnitude of public health problems caused by chronic exposure to arsenic and other heavy metals
4. Remember the roles of continuing learning and regional collaboration in hazard identification, risk assessment and poison prevention

Introduction: Poisoning is an important public health problem in the Asia Pacific Region. There are easy access to pesticides and continuing exposure to arsenic in drinking water in many areas. Intentional and accidental exposures to drugs, chemicals, natural toxins and emerging poisons can also occur. We should all learn from the public health initiatives and strategies to strengthen poison prevention and control in the Region and recognise the contributions made by the poison control centres, research consortia and clinical toxicologists.

Methods: Reports on poisoning and drug overdoses from the Asia Pacific Region were identified by searching Medicine, Embase, Google, Google Scholar and our archives of medical literature. Mainly toxic exposures affecting large number of subjects with important implications for poison prevention were reviewed.

Results: Pesticide poisoning is common in countries with large rural populations and in rural areas of the developed countries. Banning the use of the most toxic pesticides and limiting the access to other preparations result in a dramatic decline in fatal self-poisoning.

Similarly, improved packaging of drugs and chemicals and replacing drugs of greater toxicity should reduce the likelihood of severe poisoning in accidental and intentional poisoning.

Chronic arsenic exposure via contaminated drinking water is associated with several types of cancers, adverse pregnancy and developmental outcomes and other health effects. Mitigation strategies are required to minimise the causes and effects of arsenic contamination.

There are rich supplies and growing demand for coral reef fishes. To prevent ciguatera and take prompt actions during outbreaks, risk assessment studies to define their ciguatoxic potential, accurate information on fish species and their sources as well as traceability are required.

Toxicovigilance and networking of poison control centres are also needed to identify poisoning of public health significance and emerging hazards. Toxic preparations that are obtained abroad or via the internet can pose diagnostic and management challenges.

Conclusions: There is a lot to learn from the successes and challenges in poison control and prevention in the Asia Pacific Region. Regional collaboration is required to characterise and manage the known and emerging poisoning risks, which may differ between rural and urban populations in different countries. With the diverse sources of toxic exposures and the complexity of the subject, there is an increasing need for expertise in clinical toxicology and a multi-disciplinary approach to toxicological problems.
Oral Abstracts

1A-01

DO OP OR PYRETHROID INSECTICIDES CAUSE DIABETES?

Michael Eddleston

University of Edinburgh

Background: Diabetes mellitus is a chronic condition that results from impaired insulin secretion and or function and is associated with significant morbidity and mortality. It is now becoming an increasing challenge in the developing world due to changing demographics and exposure to different risk factors. One such factor associated with increased risk is exposure to pesticides through widespread use and contamination of food and drinking water. Clinical studies have shown hyperglycaemia during acute OP and pyrethroid poisoning but not shown any medium term effects of the exposure. We aimed to determine whether OP and/or pyrethroid poisoning was associated with impaired glucose tolerance at hospital discharge and at 3-12 month follow-up.

Methods: We recruited patients with normal HbA1c and normal fasting blood glucose presenting to hospital with acute pesticide poisoning in Anuradhapura, Sri Lanka, and Chittagong, Bangladesh, respectively. In Anuradhapura, we recruited patients poisoned with organophosphorus (OP) or carbamate insecticides, or herbicides (particularly glyphosate). In Chittagong, we recruited patients poisoned with OP and/or pyrethroid insecticides, or other pesticides. A formal 75 g oral glucose tolerance test was performed at hospital discharge and again at 12 months (Anuradhapura) or 3 months (Chittagong). The BMI and waist-hip and arm circumference were measured.

Results: We recruited 73 (30 OP, 23 carbamate, 20 herbicide) and 151 (70 OP, 40 pyrethroid, 17 OP and pyrethroid, 24 others) patients in Anuradhapura and Chittagong, respectively. Patients in Sri Lanka were older (median 32 [IQR 23-45] yrs) and heavier (mean BMI 21.3 [SD 5.8]) than patients in Bangladesh (22 [19 to 30] yrs, BMI 20.0 [3.2]). At hospital discharge in Sri Lanka (median 10 [IQR 6-15] days after poisoning) and Bangladesh (3 [2-5] days after poisoning), 6 (8.2%) patients and 11 (7.3%) patients, respectively, had diabetes (glucose >11 mmol at 120 min) while an additional 23 (8.2%) patients and 57 (37.7%) patients, respectively, had impaired glucose tolerance (glucose >7.8 mmol at 120 min). Glucose concentrations in the diabetic range was most common after combined OP and pyrethroid poisoning: OP 8 (8.0%), pyrethroid 3 (7.5%), OP &pyrethroid mixtures 5 (29.4%); carbamate 0 (0%), herbicide 1 (5.0%), others 0 (0%). AUC analysis of the Sri Lankan patients showed those with OP poisoning to have significantly higher blood glucose and blood insulin concentrations in the OGTT than carbamate or herbicide poisoned patients. At one year follow up of Sri Lankan patients, 29.4% of OP patients, 29.4% of carbamate patients, and 23.1% of herbicide patients had deranged glucose. At three month follow up of Bangladeshi patients with impaired glucose tolerance, 55.6% of OP &pyrethroid patients, 33.3% of pyrethroid patients, and 23.8% of OP patients had deranged glucose metabolism compared to none of the ‘other’ patients.

Conclusions: Poisoning with OP and pyrethroid insecticides is associated with deranged glucose metabolism at hospital discharge, when otherwise very well. A substantial proportion of these patients continue to have deranged glucose tolerance at follow-up, three to twelve months later. This acute effect is associated with impaired insulin function in OP but not herbicide or carbamate poisoned patients. Future studies need to track the long term effects of the acute poisoning on diabetes risk and to explore the mechanisms of impaired insulin effectiveness.

Learning Objectives:
1. Understand the acute effects of acute pesticide poisoning on blood glucose concentrations
2. Appreciate the incidence of deranged glucose function at hospital discharge as identified using an oral glucose tolerance test
3. Understand the potential risks of OP and pyrethroid exposure for later development of diabetes
Oral Abstracts

1A-02

GLUFOSINATE HERBICIDE POISONING – A REVIEW

Yan-Chiao Mao

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Abstract: Glufosinate (D, L-phosphinothricin) derived from Streptomyces spp. with herbicidal activity was registered and marketed since 1984. It is a glutamate analog and is relatively safe for agricultural purposes as compared to other nonselective herbicides such as glyphosate and paraquat based on the oral median lethal dose (LD50) estimation. In rats and mice, the LD50 values were 1510–1660 mg/kg and 436–464 mg/kg, respectively. In humans, the estimated lethal dose is 5.5 ml/kg of oral exposure to 18.5% glufosinate-containing herbicide or serum glufosinate level of ≥ 15 μg/ml. After deliberate ingestion, glufosinate-containing herbicide was rapidly absorbed in the gastrointestinal tract and eliminated by the kidney. The elimination half-life was estimated to be 4.5–4.78 h in rats and 9.59 h in humans with a distribution volume of 0.53 L/kg and 1.44 L/kg, respectively. The common toxic effects were nausea, vomiting, abdominal pain, diarrhea, and mucosal injury within hours after ingestion. The typical toxic effects include delayed neurotoxicity (e.g., consciousness depression, coma, seizure, and amnesia) possibly mediated through the brain N-methyl-D-aspartate (NMDA) receptor and respiratory failure that develops 4–44 h post ingestion. Several deaths resulting from hypotension, shock, and cardiovascular collapse, which may have occurred due to the anionic surfactant sodium polyoxyethylene alkyl ether sulfate (AES), have been reported. Both the parent compound and its metabolite have NMDA receptor binding activity that leads to seizure in the studied animals, which could be prevented by pretreatment with NMDA receptor antagonists. Glufosinate herbicide poisoning is diagnosed on the basis of pertinent history or blood and urine glufosinate testing by mass spectrometry (e.g., GC-MS or LC-MSMS) with or without chemical derivation. The current management is supportive, including adequate hydration, seizure control, and artificial ventilation if respiratory failure occurs. Hemopurification, i.e., hemodialysis may not protect patients from seizure or coma; however, its efficacy on AES removal or shock management remains uncertain. Further characterization of the amnesia and evaluation of the possible therapeutic role of NMDA receptor antagonists are recommended.

Learning Objectives:
1. Acute toxicity
2. Mechanism
3. Toxicokinetics
4. Diagnosis and Management
5. Future aims
Oral Abstracts

1B-01

EFFECTIVE USE OF SOCIAL MEDIA IN AWARENESS DEVELOPMENT AND MANAGEMENT OF SNAKEBITE IN BANGLADESH

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Objectives: Snakebite is an important public health hazard in Bangladesh. Recent countrywide epidemiological survey estimated an annual incidence of 623/100,000 and 6,041 deaths annually. But there is a problem of awareness among common public as evident by seeking care of traditional healers by a significant percentage of victims; and there is also lack of knowledge among health care personals as evident by inappropriate referral of patients to tertiary level hospitals without providing any treatment at primary or secondary level hospitals. Current govt. of Bangladesh has declared to build up a digital Bangladesh by implementing vision 2021. Most of the doctors and a large segment of public are using smart mobile phones and also internet facility is available all over the country even in the most remote and coastal areas. The objective of the study is to create social awareness; collective sharing of experiences and dissemination of evidence based standard management of snakebite among physicians and herpetologist through online social media (Facebook).

Learning Methods: A group of designated people studied different online forums with similar objectives addressing other health issues. An online discussion forum on different aspects of snake, snakebite management and public education was created. People were invited and encouraged to join and actively participate, share their experience and problems regarding snake and snakebite management.

Results: More than 2200 doctors, Herpetologists, media personals, online activists and common people have been added to a facebook group named “SNAKE BITE STUDY CLUB OF BANGLADESH” (https://www.facebook.com/groups/853651011398715/) after its creation on 12 august 2015. Many of the members work in different institutions of Bangladesh and are actively involved in health care service. Through Facebook they share their experience and problems in snakebite management, can get recent updates. Group members working in primary health care settings can seek advice from experts working in tertiary level hospitals. They can also seek help from herpetologist group members to identify offending snake. The whole endeavor was based on voluntary participation and contribution basis.

Around 24 snakes have so far been identified by the expert group members on the basis of uploaded pictures on the group page. Around 20 members of the group who are working in the different hospitals of Bangladesh sought advice regarding management of more than 100 cases of snakebite. National guideline of snakebite management of Bangladesh is uploaded in the page, which has been shared more than 700 times.

Conclusion: People working at various levels and on different aspects of health problem (like snakebite) can be connected through Facebook group. This forum can be used to create public awareness and effective dissemination of knowledge among professionals and can also be a source of expert advice in individual case management. All these can be achieved with nil or minimal financial involvement. Social media can play a significant role in the management of snakebite, which ultimately reduces the casualty caused by snake bite.
Objectives: The World Health Organisation (WHO) recommends Poisons Information Centres (PIC) involvement in toxicovigilance activities which develop, implement and measure the prevention of poisonings.1 Practice standards for Australian Poisons Information Centres also support these activities.2 A dedicated toxicovigilance position was created at the New South Wales Poisons Information Centre (NSWPIC) to enhance poisoning prevention and to promote the service. This study aims to evaluate the impact of this position on poisoning awareness/prevention and Australian PIC call volumes.

Methods: The toxicovigilance position was created in June 2015, and was the first of its kind in Australia. Content of the NSWPIC website was refreshed with new factsheets to coordinate with current research activities and increase community awareness of high risk poisonings, including carbon monoxide (CO). A Facebook page was created and a media policy was devised to cover the specific responsibilities of a PIC. Relationships were established with public relations departments and the media. Content for promotion of the PIC service was linked to our research and community/health department concerns as determined by scanning other web-based media.

Results: Media interactions by NSWPIC have increased from 3 to 17 in the 12 months since June 2015. NSWPIC website activity has increased steadily since its launch to over 3500 visits/month. The exponential nature of Facebook sharing saw our initial post on the safe storage of medications reach over 500,000 people internationally. Since the targeted winter campaign on CO poisoning there have been no serious accidental CO poisonings reported to the NSWPIC thus far this winter. Last winter there were 3 deaths due to CO reported by media. Call numbers to the NSWPIC increased consistently since March 2016, reversing the declining trend seen over previous years. Other Australian PICs recorded similar call volume increases. Reasons behind this increase are likely to be multifactorial, however, given that all four Australian PICs share a national phone number it would be reasonable to assume that promotion of the NSWPIC service has had a flow on effect to all centres.

Conclusion: Establishment of a dedicated toxicovigilance position enabled a focus on poisoning prevention and promotion of the service. This increased service utilisation and public awareness. The exponential nature of Facebook has been particularly effective at spreading the message. Initial focus has been on prevention of accidental poisonings, however there is a plan to expand the toxicovigilance activity to incorporate prevention of deliberate self harm and recreational substance abuse.

Oral Abstracts

1B-03

‘LIVING WITH THE ENEMY’: FROM CLASSROOM TO REAL SITUATION

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1National Poison Centre, Malaysia, 2Tuanku Fauziah Museum and Gallery, USM

Objectives: The objective of this project is to further strengthen and boost the knowledge of children and young adults on poisoning and chemical safety starting from within the home. This project is closely associated with Toxicology in the Classroom (TOXICLARO) and TOXLAND ADVENTURE, an edutainment game. ‘Living with the Enemy’ uses an actual home model for better understanding and correct practices on the prevention of poisoning.

Methods: A model house of 550 sq. ft. comprising of six common living areas was constructed at the UniversitiSains Malaysia Tuanku Fauziah Museum and Gallery (MGTF) in Penang. Visitors to “Living with the Enemy’ begin their tour of the house from the front yard which takes them to the living room, bedroom, washroom, kitchen and garage/backyard. Commonly used household products in chemical form and pharmaceuticals are displayed in every section of the house. Though seemingly harmless, these products are potential agents for poisoning. Information on the products and instruction for appropriate handling and storage accompany the items on display.

Results: Statistics (2006 – 2014) from the Malaysia National Poison Centre (NPC) reveal that 92.3% accidental poisoning incidents involving children happen at home, commonly involving household chemicals (40.5%), pharmaceuticals (37.9%), household insecticide (15.9%). The NPC in collaboration with MGTF developed ‘Living with the Enemy’ (LWTE) by using a model house complete with common household products that can potentially result in poisoning to enable children and young adults to learn more about prevention of poisoning. To ensure the provided information given is well-comprehended, visitors are given an activity book to furnish during the house tour. Answers for each activity are present in the model home. The correct answers are also provided in the book in case visitors are unable to detect the answer from touring the model house.

Conclusion: ‘Living with the Enemy’ is a learning tool to attract children and young adults to learn more about poisoning and chemical safety in their homes in a less formal but interactive way. This knowledge tool complements the earlier learning modules by NPC namely, TOXICLARO and Toxland Adventure. It is hoped this innovation will further boost children’s understanding of basic toxicology starting from within the home.
Oral Abstracts

2A-01

USE OF E-CIGARETTES AND ELECTRONIC NICOTINE DELIVERY DEVICES TO VAPE RECREATIONAL DRUGS AND NEW PSYCHOACTIVE SUBSTANCES

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Background: There is increasing use of electronic nicotine delivery devices (ENDD) such as electronic cigarettes for the inhalation of nicotine to reduce smoking of cigarettes and tobacco itself. In addition there are “vapouriser” devices which vapourise compounds into a large self-contained bag, from which an individual then inhales. Over the last few years there has been increasing interest and concern as to whether both electronic nicotine delivery devices and vapourisers can be used for the delivery of both classical established recreational drugs as well as novel psychoactive substances (NPS). In this lecture, we will review the limited available evidence that these devices are being used for the delivery of recreational drugs and NPS.

Cannabis use by ENDD/vapourisers: In the 2015 US Monitoring the Future project, 13.4% of the approximately 44,900 respondents had used these devices, with only 6-7% reporting that they had inhaled marijuana / hashish oil by this route[1]. In a survey of 2,910 cannabis users recruited through Facebook, 61% reported having previous vaping of cannabis; the mean age of first vaping (24 ± 12 years) was higher than the mean age of first cannabis use (16 ± 4 years)[2]. Overall, the majority of individuals used cannabis by smoking, with only 0.2% (7 individuals) reporting that they only vaped cannabis. There appears to be an association of vaping cannabis and the legal status of cannabis. In an online survey of 2,838 cannabis users, those who lived in US states where cannabis use was legalized had higher rates of vaping use (69%) compared to those living in states where cannabis use was not legalized (54%) [3].

There is no reported data on the potential harms associated with the vaping of cannabis, although there does appear to be some potential benefits from using cannabis by this route. Surveys of vapouriser cannabis users report the main reasons for use by vapourising rather than smoking include: i) perceived health benefits; ii) better taste; iii) no smoke / smell / more discreet; and iv) more effect for same amount of marijuana [4]. Vaping of cannabis may be associated with less effects on lung function than seen with the traditional smoking of cannabis (this is known as “mulling” where the cannabis is mixed with tobacco prior to smoking). In a survey of almost 6,731 cannabis users, 66% of those who used by smoking (n=6,731 users) reported respiratory symptoms compared to 56% of those who used by vapourising only (n=152)[5]. A trial of 22 regular cannabis users studied before and 30 days after switching from regular cannabis use to use by vapourising only, demonstrated improvements in ‘respiratory distress’, FEV1 and FVC[6].

Other recreational drug and NPS use by ENDD/vapourisers: There is no population or sub-population data on ENDD / vapourisers being used to take other recreational drugs and/or NPS, with only limited anecdotal evidence from online user discussion forums and a small number of case reports. In May 2016, there were a total of 84 user posts on the Internet discussion forum Erowid related to the use of ENDD/vapourisers to take recreational drugs/NPS. Of the non-cannabis reports (48 user reports), 21 related to a range of different synthetic cannabinoid receptor agonists (SCRAs) and 8 related to a range tryptamines. There were some reports related to cathinones, phenylethylamines and other NPS. To date there are two case reports of acute toxicity related to vaping of acetylfentanyl [Rogers JS 2016] an SCRA [McCloskey K 2016].
Conclusions: There appears to be increasing evidence from population/subpopulation surveys that cannabis is being used through ENDD/vapourisers. There appear to be some benefits of this route of drug administration, although these need to be offset against the risks of increased/more frequent inhalation by this route. There is limited evidence currently of other recreational drugs and/or NPS being used by “vaping”. It should be possible to predict which drugs may be used by this route based on their heat stability.

References:

Learning Objectives:
1. Describe the prevalence of cannabis use by electronic nicotine delivery devices (ENDD) and vaporizers.
2. Understand the potential benefits of vaping cannabis over traditional smoking of cannabis
3. Describe the pattern of other recreational drugs and novel psychoactive substances that can be used by ENDD/vaporizers.
Oral Abstracts

2A-02

ABUSE AND DETECTION OF NEW PSYCHOACTIVE SUBSTANCES IN SINGAPORE

Yao Yi Ju

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Abstract: The abuse of New Psychoactive Substances (NPS), commonly known as “designer drugs”, “legal highs”, “herbal highs”, “research chemicals” or “bath salts” has increased substantially in recent years. Typically, these NPS are “designed” by introducing slight structural modifications to the psychoactive substances to circumvent drug control. This presentation will share with the audience how our analytical toxicology laboratory detects the presence of NPS in biological samples submitted for toxicology screening, the abuse trend of NPS in Singapore, and some case studies in clinical and postmortem cases.

Learning Objectives:
1. Legislative control of New Psychoactive Substances (NPS) in Singapore
2. Abuse trend of NPS in Singapore

Methods: A review of past clinical and forensic toxicology cases where NPS were detected with various gas and liquid chromatography with mass spectrometers

Results: NPS commonly detected in Singapore were synthetic cathinones (e.g. ethylone, methylone, methylmethylcathinone, methylethcathinone), amphetamine-type stimulants (e.g. para-methoxymethamphetamine, methiopropamine), tryptamines (e.g. 5-MeO-DiPT, 5-MeO-MiPT) and synthetic cannabinoids (e.g. JWH-018, AM-2201).
The Diversification of Medications in Thai Adolescents, Will We Ever Catch Up

Chulathida Chomchai

Abstract: Thai adolescents have been using legal medications for recreational purpose for the past few decades. In the 1990’s, cough syrup containing codeine was reported to be abused widely by teenagers in Southern Thailand. Subsequently, the introduction of ‘Lean’ music, originated from the Rap/Hip Hop genre, was made popular by the rapper DJ Screw in 1990’s. The word ‘lean’ described a drink concoction which contained the cough medicine promethazine with codeine (Phenergan with codeine®) and has the street name Lean Sizzurp or Purple Drank. The music, as well as the drug culture, had been transferred to Thai youths through the debut of songs and personal videos on YouTube involving the use of Lean by Thai rap artist Illslick in 2012, in which the opioid codeine was replaced by a more locally available drug tramadol and called ‘Ya Pro’ in Thai. The toxicity ranged from agitation and dysphoria, to seizures, especially when promethazine is combined with tramadol. Once the authorities had caught up with such practice, the use diversified to include other phenothiazines such as perphenazine and chlorpromazine, resulting in greater toxicity. Eventually, the use settled on trihexyphenidyl 5 mg, commonly called ‘B5’, which had been widespread among adolescents in Bangkok. The toxicity included peripheral and central anticholinergic toxidrome that lasted anywhere from hours to several days.
Oral Abstracts

2A-04

CLINICAL AUDIT QUESTIONS CANNABIS HYPEREMESIS SYNDROME

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Abstract: Thai adolescents have been using legal medications for recreational purpose for the past few decades. In the 1990’s, cough syrup containing codeine was reported to be abused widely by teenagers in Southern Thailand. Subsequently, the introduction of 'Lean' music, originated from the Rap/Hip Hop genre, was made popular b
In 2004, a Cannabis Hyperemesis Syndrome was proposed by Allen et al (1, 2); subsequently case reports emerged (7, 8, 9, 10) generally supporting this notion despite some medical criticism and alternative explanation (3, 4, 5, 6). Since 2006, a number of patients have been identified within the Alcohol & Drug treatment sector and in Emergency Department settings with suspected Cannabis Hyperemesis Syndrome. While an association between Cannabis use and Hyperemesis is now reported, causation remains unproven. Further, Cyclic Vomiting Syndrome (CVS) is very similar in most aspects to the “Cannabis Hyperemesis Syndrome” and might be an alternative diagnosis.

Over the past 6 years, 12 cases referred to Western Hospital’s Department of Addiction Medicine & Toxicology with suspected diagnosis of Cannabis Hyperemesis Syndrome were investigated and in most, a Cannabis use association was not always present in the history and a few had a history more suggestive of withdrawal as a trigger rather than recent heavy Cannabis use. Most did not respond to usual antiemetics however all responded to Droperidol. A family history of migraine was a common background finding. Cannabis use is common as is “emotional stress” and eating chocolate, also reported triggers of CVS. Following this clinical audit, the fact the Cannabis use alone triggers Hyperemesis is questioned.

Oral Abstracts

2B-01

PREVENTING PESTICIDE SUICIDES BY RESTRICTING ACCESS FROM SHOPS - EXPLORATORY AND PILOT STUDIES

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Objectives: We aimed to identify a public health intervention that has the potential to be effective in reducing access to pesticide from shops for self-poisoning. An effective intervention could contribute to saving thousands of lives every year across rural Asia.

Methods: We used the three steps ‘systems thinking’ approach to identify the most appropriate intervention; (1) A case control study - fifty self-poisoning patients who had bought pesticides from shops (cases) were compared with 200 unmatched legitimate customers (controls) to identify risk factors associated with purchasing pesticide from shops for self-poisoning. (2) A stakeholder analysis - ten focus group discussions were held with key stakeholders to identify the most promising intervention for field test. (3) A feasibility study –the selected intervention was field tested in 14 pesticide shops to assess the feasibility and acceptability.

Results: The case control study identified two key risk factors that might be recognizable by a pesticide vendor - that of being intoxicated (OR 33.7, 95% CI 2.2 to 508.0) and being a non-farmer (OR 10.5, 95% CI 2.1 to 53.3). Avoiding selling pesticides to alcohol intoxicated men and non-farmers would prevent 72% of cases where pesticides were brought from shops for the act. We analyzed our findings in the context of a literature review and identified four potential interventions (farmer Identity cards, prescription for pesticides, increased waiting times before purchased and vendor training) that might reduce access to pesticides from shops for self-poisoning. Vendor training was the most strongly supported intervention, being ranked first by the stakeholders. Facilitators strongly favored vendor gatekeeper training since farmers did not think it would affect their current practice, vendors were already doing it (while appreciating the opportunity for formal training), and the Department of Agriculture believed such a program could be incorporated into ongoing work. Vendors were trained to observe customer behaviors, to check for intoxication, and to ask questions that farmers would know. Vendors reported that over the three months they were aware from community feedback that they had prevented at least seven suicide attempts. However, on four occasions they had been unable to recognize the real intention of the customers who had then drunk pesticide.

Conclusion: Our study suggests that training for all pesticide vendors in a region has the potential to prevent a substantial proportion of people who buy pesticides for self-poisoning. Further assessment of the effectiveness and sustainability of this initiative is needed.
Oral Abstracts

2B-02

RELATIONSHIP BETWEEN ALCOHOL CO-INGESTION AND OUTCOME IN PROFENOFOS SELF-POISONING- A RETROSPECTIVE CASE SERIES

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Objective: Acute pesticide self-poisoning is a major public health problem in many developing countries. Ethanol is an important risk factor for pesticide poisoning and is commonly co-ingested during self-poisoning with pesticides. This study was performed to compare the clinical outcomes of acute poisoning with the organophosphorus (OP) insecticide profenofos, with or without alcohol co-ingestion.

Method: This is a retrospective case series of acute profenofos EC50 insecticide self-poisoning presenting between 01 January 2013 to 30 June 2016 to the specialized Toxicology unit, Teaching Hospital Peradeniya, and to Teaching Hospital Kurunegala, Sri Lanka. Demographic and clinical data were collected from acute profenofos poisoning along with a history of alcohol co-ingestion.

Results: A total of 255 patients with acute OP insecticide poisoning presented over 3.5 years to these two hospitals. From this cohort, 163 (64%) patients had ingested profenofos [median age 36, (IQR 26-48)] of whom a quarter had co-ingested alcohol (n=41/163, 25%). Males made up the majority of profenofos poisoning cases (125/163, 77%) and all who had co-ingested alcohol (41/41 vs 84/122, p=0.0001, $X^2=15.76$). Cases who co-ingested alcohol were older [median 48 (IQR 35-59) years] than for those who did not [36 (24-50) years]. More patients with co-ingestions required intubation (8/41, 20%) than those who did not (10/122, 8%, p=0.034, $X^2=4.48$). Patients who co-ingested profenofos and alcohol had a longer hospital stay (median 3.9 (8.6 to 2.7) vs 3.2(4.7 to 1.8) days and more often died (7/41 [17.1%] vs 14/122 [11.5%], p=0.36, $X^2=0.85$) than those who did not drink alcohol. Multi-logistic regression showed an increased risk of death with male sex (odds ratio [OR] 5.43 [95% CI 0.70-42.38]), age (OR 9.35 [95%CI 2.06 - 42.35] for age >36 years compared to 36 years or less), and alcohol co-ingestion (OR 2.31 [95%CI 0.82-6.52]).

Conclusion: Alcohol co-ingestion, as well as male sex and older age, is independently associated with increased severity and worse hospital outcome in patients self-poisoned with agricultural profenofos insecticide. This may be due to larger ingestions of pesticide by intoxicated patients compared to sober patients, as was previously noted for dimethoate, or due to an interaction of profenofos with ethanol. These postulates need to be evaluated in a prospective cohort. Measurement of blood profenofos concentration on admission to hospital should distinguish between these two possibilities. Efforts to reduce deaths from profenofos self-poisoning may benefit from efforts to reduce alcohol consumption.
Oral Abstracts

2B-03

EFFECTS OF LIPID EMULSION ON HEMODYNAMICS IN ORGANOPHOSPHATE COMPOUND POISONING

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Objectives: Lipid emulsion has been used to revert toxicities of lipophilic drugs and toxins (especially lignocaine) and in critically ill patients. Though the safety has been established, the effect on hemodynamics in organophosphate poisoned patients has never been studied. To study the effect of a single bolus dose of intravenous lipid emulsion on hemodynamic parameters effects in patients with organophosphate poisoning.

Methodology: The study is a prospective open label pilot study, undertaken at a tertiary care hospital in North Western India. Patients with history and clinical features of organophosphate poisoning were included in the study. All patients were treated according to institutional protocols of Atropine only without 2 PAM. Along with the standard treatment a single dose of 20% lipid emulsion was administered at admission after obtaining consent. Hemodynamic parameters like pulse, systolic and distolic blood pressure, respiratory rate and oxygen saturation were recorded every 15 minutes for first 2 hours, every half an hour for 6 hours and hourly for next 48 hours. Patients were followed up till discharge or death.

Results: Eighteen patients with organo-phosphate compound poisoning have been enrolled in the study group. Ten patients (56%) were male and the mean age was 35.7 years. Chlorpyrifos was commonest ingest ant (33%) followed by Dichlorvas (11%), and Triazophos, Parathion, Phorate and Malathion (6% each). A significant change in heart rate was noted at 1 hour, 2 hours and 12 hours following administration of lipid emulsion in the entire study population (p value <0.05). The similar changes were noted in patient presenting with shock. Significant increase in systolic pressure, diastolic pressure and mean arterial pressure were noted in the study group from baseline (p value <0.05). Mortality was 16.67% in the study group.

Conclusion: Administration of lipid emulsion in organophosphate compound poisoned individuals is associated with significant changes in heart rate, systolic pressure, diastolic pressure and mean arterial pressure in patients with and without shock. However it is difficult to attribute these changes to lipid emulsion alone as there are multiple confounding factors like atropine and inotropic agents.
Oral Abstracts

2B-04

A PILOT STUDY TO EVALUATE THE USE OF THE TRIPLE CHOLINESTERASE TEST IN ORGANOPHOSPHORUS POISONING

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Objectives: The triple cholinesterase test consisting of Plasma Butyrylcholinesterase (BChE), RBC Acetylcholinesterase (RBC-AChE) and Reactivation potential of RBC-AChE by obidoxime helps to determine the reaction potential for guiding oxime therapy. This study was conducted to:

1. Validate the test and determine if reactivation of AChE by oximes is possible in OP poisoned patients,
2. Determine clinical characteristics of patients who are likely to benefit from oximes, and
3. Determine the duration for which oximes can be given for Organophosphorus (OP) poisoning.

Methods: This prospective observational study was conducted at Christian Medical College between April and August 2015. It included 30 patients presenting with OP poisoning <30 hours after consumption. The Triple cholinesterase test was done from admission to day 5 according to standard operating protocol of Thiermann et al [Hum Exp Toxicol. 1997 Aug;16(8):473–80]. AChE values were expressed as a percentage of normal. Significant reactivation was defined as AChE levels more than 30% of normal based on the study correlating RBC-AChE with neuromuscular transmission [ChemBiol Interact. 2005 Dec 15;157–158:345–7].

Results: 26 of the 30 patients had identified OP compounds (40% dimethyl and 33% diethyl). Sustained inhibition of RBC-AChE was associated with more severe poisoning, intermediate syndrome, requirement for mechanical ventilation and later time to presentation. 13(60%) out of the 22 patients with inhibited admission RBC-AChE levels showed significant in-vitro obidoxime reactivation. This ‘Reactivation’ group had shorter time to presentation of 6.04(±3.96) hours compared to 10.94(±8.06) hours for the ‘No reactivation’ group (p=0.007). The ‘Reactivation’ group consisted predominantly of diethyl compounds (46.1%) compared to the ‘No reactivation’ group which predominantly consisted of dimethyl compounds (55.5%) and no diethyl compounds. Day 1 and 2 post-reactivation levels were 101% and 95% respectively in the diethyl group compared to 65% and 69% in the dimethyl group (p=0.16). In patients with significant reactivation, obidoxime reactivated the enzyme to >30% for a mean duration of 2.35(±1.7) days.

Conclusion: Our study showed that reactivation of AChE is possible by oximes in-vitro. The characteristics of OP poisoning patients who demonstrate in-vitro oxime reactivation of AChE are those who present within 6 hours and those with Diethyl OP compound poisoning. The average duration of reactivation was 2.4 days. This study paves the way for a future controlled clinical trial to test the efficacy of selective administration of oximes based on the triple cholinesterase test.
A PILOT STUDY TO EVALUATE THE USE OF THE TRIPLE CHOLINESTERASE TEST IN ORGANOPHOSPHORUS POISONING

Sandhya Suresh, Anand Zachariah, Jude Joseph Fleming, Arun Jose, Horst Thiermann, Franz Worek

Department of Medicine, Christian Medical College, Department of Medicine, Department of Clinical Biochemistry, Christian Medical College, Vellore, India, Institut für Pharmakologie und Toxikologie der Bundeswehr, Munich, Germany

Objectives: The triple cholinesterase test consisting of Plasma Butyrylcholinesterase (BChE), RBC Acetylcholinesterase (RBC-AChE) and Reactivation potential of RBC-AChE by obidoxime helps to determine the reactivation potential for guiding oxime therapy. This study was conducted to:

(1) Validate the test and determine if reactivation of AChE by oximes is possible in OP poisoned patients, (2) Determine clinical characteristics of patients who are likely to benefit from oximes, and (3) Determine the duration for which oximes can be given for Organophosphorus (OP) poisoning.

Methods: This prospective observational study was conducted at Christian Medical College between April and August 2015. It included 30 patients presenting with OP poisoning <30 hours after consumption. The Triple cholinesterase test was done from admission to day 5 according to standard operating protocol of Thiermann et al [Hum Exp Toxicol. 1997 Aug;16(8):473–80]. AChE values were expressed as a percentage of normal. Significant reactivation was defined as AChE levels more than 30% of normal based on the study correlating RBC-AChE with neuromuscular transmission [Chem Biol Interact. 2005 Dec 15;157–158:345–7].

Results: 26 of the 30 patients had identified OP compounds (40% dimethyl and 33% diethyl). Sustained inhibition of RBC-AChE was associated with more severe poisoning, intermediate syndrome, requirement for mechanical ventilation and later time to presentation. 13 (60%) out of the 22 patients with inhibited admission RBC-AChE levels showed significant in-vitro obidoxime reactivation. This ‘Reactivation’ group had shorter time to presentation of 6.04 (±3.96) hours compared to 10.94 (±8.06) hours for the ‘No reactivation’ group (p=0.007). The ‘Reactivation’ group consisted predominantly of diethyl compounds (46.1%) compared to the ‘No reactivation’ group which predominantly consisted of dimethyl compounds (55.5%) and no diethyl compounds. Day 1 and 2 post-reactivation levels were 101% and 95% respectively in the diethyl group compared to 65% and 69% in the dimethyl group (p=0.16). In patients with significant reactivation, obidoxime reactivated the enzyme to >30% for a mean duration of 2.35 (±1.7) days.

Conclusion: Our study showed that reactivation of AChE is possible by oximes in-vitro. The characteristics of OP poisoning patients who demonstrate in-vitro oxime reactivation of AChE are those who present within 6 hours and those with Diethyl OP compound poisoning. The average duration of reactivation was 2.4 days. This study paves the way for a future controlled clinical trial to test the efficacy of selective administration of oximes based on the triple cholinesterase test.
EXTRAPYRAMIDAL EFFECTS OF ACUTE ORGANOPHOSPHATE POISONING

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Objectives: There is limited information on extrapyramidal symptoms in acute organophosphate (OP) poisoning. We describe the course and outcome of severely poisoned patients who develop extrapyramidal manifestations.

Methods: In this prospective observational study, spanning 8 months (Apr–Nov 2013) adult patients (>18 years) admitted with OP poisoning were enrolled. Patients on anti-psychotic therapy, those refusing consent or presenting with co-ingestions were excluded. Treatment included atropine and supportive care (e.g. ventilation and inotropes as indicated); oximes were not administered. The presence of rigidity, tremors, dystonia and chorea were assessed daily till discharge using modifications of the Unified Parkinson's Disease rating scale and the Tremor rating scale. The presence of extrapyramidal manifestations was correlated with length of ventilation and hospital stay and mortality.

Results: Of the 77 patients admitted with OP poisoning, 32 were enrolled; 17 (53.1%) developed extrapyramidal manifestations which included rigidity (94.1%), tremors (58.8%) and dystonia (58.8%). None developed chorea. The median (inter-quartile range) time of symptom onset was 8 (5–11) days; extrapyramidal features resolved in 11 (6–17) days. The median duration of intensive care stay in patients not developing extrapyramidal symptoms was 6 (2–8) days. Overall, 27/32 (84%) were ventilated. Hospital mortality was 6.25% (2/32). When compared with patients not developing extrapyramidal signs, those with extrapyramidal manifestations had significantly prolonged ventilation (5 versus 16 median days; p = 0.001) and hospitalization (8 versus 21 days; p < 0.001), reduced ventilator-free days (23 versus 12 days; p = 0.023) and increased infections (p = 0.03). The need for ventilation and mortality were not significantly different (p > 0.6). Extrapyramidal symptoms were not observed in non-OP poisoned patients with prolonged ICU stay.

Conclusion: In this small series of acute OP poisoning, extrapyramidal manifestations were common after 1 week of intensive care but self-limiting. They are significantly associated with longer duration of ventilation and hospital stay.
BROMOXYNIL OR MCPA – THE TOXIC INGREDIENT

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Objectives: To describe the clinical syndrome of bromoxynil +/- MCPA poisoning.

Introduction: MCPA, a chlorophenoxy herbicide has been shown to be relatively safe with minor adverse effect and the mortality rate (4.4%) is reported to be low.[1] In contrast, there has been little literature available regarding bromoxynil poisoning, a nitrile herbicide which is often sold in combination with MCPA.

Methods: We presented a case series of MCPA and/or bromoxynil poisonings that were reported to the New South Wales or Western Australia Poisons Information Centres and three toxicology units from Jan 2010 to May 2016. There were 35 cases identified. In addition, three fatal cases were identified through the National Coronial Information System.

Results: There were a total of 38 cases who either ingested bromoxynil, MCPA with bromoxynil or MCPA with other herbicides. Sixteen cases were unintentional with a median age of 2y (Range: 1.5-5y) and no significant adverse effects were reported. Twenty-two cases were intentional but three were excluded due to insufficient information. Nine patients drank MCPA with bromoxynil, seven drank MCPA with dicamba, one drank MCPA with moxidectin, one had bromoxynil, glyphosate and bromadiolone and one had bromoxynil alone. Median age was 46y (range: 26-77y); 63% male. There were eight fatalities, 6/11 patients (55%) who ingested bromoxynil +/- MCPA died compared to 2/8 patients (25%) taking MCPA without bromoxynil. Deaths occurred at about 17-30 hours post ingestion in 7 patients and were characterized by tachycardia, tachypnea, hypoxia, rising CO2, worsening metabolic acidosis, hyperthermia and eventual asystolic cardiac arrest. One patient died at seven days from hypotension and renal failure secondary to rhabdomyolysis following MCPA and moxidectin ingestion.

With six of the fatalities, it is likely that bromoxynil alone or MCPA with bromoxynil contributed to the cause of death. Laboratory analysis confirmed the presence of either bromoxynil and/or MCPA in seven fatalities.

Conclusion: Bromoxynil with or without MCPA appears to be extremely toxic with what appears to be decompensation of oxidative phosphorylation resulting in increased CO2 production, metabolic acidosis, hyperthermia and death. MCPA appears to cause death by a different mechanism from rhabdomyolysis, and renal failure.

Reference
Oral Abstracts

3B-02

NEUROCOGNITIVE CHANGES IN SURVIVORS OF ALUMINIUM PHOSPHIDE POISONING IN ACUTE PHASE AND FOLLOW UP TILL 3 MONTHS

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Objective: To determine the neurocognitive function in survivors of acute aluminium phosphide poisoning after stabilisation in the acute phase and at 3 months follow up

DESIGN: Prospective cohort study

SETTING: Medical Emergency, Department of Internal Medicine, PGIMER Chandigarh, tertiary care centre in North India.

Methods: 23 cases of acute Aluminium phosphide poisoning presenting to the emergency/wards/ICU with acute AIP3 poisoning were included in the study. The diagnosis of AIP3 poisoning was based on history of ingestion or accidental exposure to AIP3 compounds and the characteristic clinical features. Severity of poisoning was based on the PGI scoring system which included three variables [ pH< 7.2, systolic BP < 90, GCS < 12 ]. Patients with unknown compound poisoning and h/o cognitive dysfunction prior to poisoning were excluded. Brain SPECT and perfusion MRI were performed on these patients after stabilisation. Patients having a MMSE of more than 23 were subjected to tests selected for determining the neurocognitive function were like, trail making test, PGI memory scale, Verbal fluency test, Bender visual motor gestalt test.

Results: Test for cognitive functions like Trail making test A: (Test for attention) at baseline was abnormal in 20 patients with the mean time of 115.45(±54.469) seconds, which was significantly more than the normative value for that age, sex and education matched population. With statistically significant improvement (p<0.000) At 3 months with a mean time of 95.67(±49.058).

Trail making test B: (Test for executive function) was abnormal in 16 patients at baseline with a mean time of 139.06(±44.618) seconds, which was significantly more from that of the normative data. With a statistically significant improvement to mean time of 110.91(±27.278) seconds. (p = 0.027).

PGI memory scale to test memory was administered to 23 patients at base line and the measured values in the individual components were significantly lower than that of the normative data except in immediate recall, verbal retention for similar pairs, and visual recognition, which were similar to the normative data. At 3 months follow-up, significant difference was achieved with that of the baseline results in all the components except visual recognition, in which the results were similar to normative values at baseline itself. At 3 months, measured values were significantly lower than the normative data in remote memory, mental balance and visual memory. In all the other components, they were similar to standardized normative data. The score of all the individual components was summed up and the percentile calculated at baseline, 6 weeks and 3 months duration. The mean(±SD) were then compared with the baseline value using the paired t-test.(Table 6). The percentile at baseline was significantly lower than the normative value, at 6 weeks it improved to more than 50%.
Verbal fluency test was administered at baseline, the mean(±SD) no. of words in each group was significantly lower than that of standard controls. This difference persisted till 3 months.

Bender Visual Motor Gestalt test was administered in 22 patients at base line. The mean(±SD) Errors and DR and at 3 months were significantly more than that of standard control population. The most common Errors noted were abbreviation(82.6%) followed by perseveration(65.2%), point of contact(47.8%), angle closure(30.4%), separation of lines(21.7%), distortion(21.7%), absence of erasure(17.4%), added angles(17.4%), embellishment(13%), partial rotation(8.7%), omission(4.3%) and rotation/reversal(4.3%)

Conclusions: Our study showed that
- Cognitive functions involving the domains of attention, executive function, remote memory, recent memory, mental balance, attention and concentration, delayed recall, verbal new learning, visual retention, semantic memory, language/ speech and visuospatial functions were impaired in the acute phase of poisoning, when assessed immediately after stabilization.
- Immediate recall, verbal associative learning, and visual recognition were relatively spared.
- Deficits in mental balance and delay recall improved and normalized earlier at 6 weeks. No residual deficits were observed in them.
- Recent memory, semantic memory, speech/language showed a trend towards improvement at 6 weeks, however they were still abnormal as compared to the normative data even at 3 months.
- Although attention, executive functioning, remote memory, verbal new learning, visual retention and visuospatial kills improved later at 3 months, there were significant residual defects persisting.
3B-03

REDUCING CELL MACROMOLECULE DAMAGE PROTECTS RATS AGAINST MONOCROTOPHOSINDUCED TYPE 1 PARALYSIS

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Acute severe organophosphate pesticide induced Type I paralysis is a common medical condition in most of Asia particularly India that can lead to Type II paralysis which is associated with significant morbidity and mortality. Type I paralysis is a consequence of cholinergic hyper stimulation and prevention would improve outcome of poisoned patients. This paper will present an animal model of stress induced protection against monocrotophos induced Type I paralysis.

Objectives: To study the mechanism of noise stress induced protection against Type I paralysis in monocrotophos poisoned rats

Methods:
1. Rats were exposed to noise stress (75-90dBA, 3-4hrs / day, six days a week, 8 months).
2. Non-stressed control and noise-stressed rats were subject to severe monocrotophos poisoning (0.8LD50)
3. The development and temporal profile of cholinergic symptoms and muscle weakness were observed in all rats.
4. Rats were sacrificed on recovery from muscle weakness and blood and muscle acetylcholinesterase levels, muscle oxidative damage, anti-oxidant levels and mitochondrial function and activity determined.
5. The results were analyzed for significant differences between stressed and non-stressed rats by Student’s t test for parametric data and by the Mann-Whitney test for non-parametric data.

Significance at p< 0.05.

Results: Noise stress significantly
• Reduced lipid peroxidation 3 fold and elevated glutathione peroxidase 3.5 fold in rat muscle.
• Lowered oxygen uptake through mitochondrial Complex 1 40%, reduced Complex 1 activity 60% and increased Complex IV activity 2.7 fold in rat muscle.

On monocrotophos poisoning:
• Onset of cholinergic symptoms of chewing, body tremors, salivation and lacrimation were delayed significantly by 2.5, 5.5, 5 and 7 minutes respectively and muscle weakness by 10 minutes in stressed compared to non-stressed rats.
• Stressed rats did not develop paralysis while non-stressed rats developed paralysis.
• Inhibitions of blood (>80%) and muscle (>50%) cholinesterases were similar in stressed and non-stressed rats.
• Oxidative damage was not induced in muscle of stressed or non-stressed rats.
• Muscle mitochondrial function and complex activities were not affected in stressed or nonstressed rats.
**Conclusion:** This study indicated that noise stress improved the structure of cell macromolecules through reduced oxidative damage and protected muscle from the effects of monocrotophos induced cholinergic hyperstimulation despite significant inhibition of acetylcholinesterase. The role of macromolecule structural integrity in reducing organophosphate pesticide induced muscle weakness and the potential of drugs that raise and maintain a high redox potential of muscle to prevent muscle weakness will be discussed.
Oral Abstracts

3B-04

CHOLINESTERASE ENZYME REACTIVATION AND BRAIN MITOCHONDRIA PROTECTION BY QUERCETIN AND RUTIN IN ACUTE POISONING BY DIAZINON IN MICE

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Objectives: Acute poisoning by Organophosphate (OP) pesticides is an essential clinical problem in rural Asia. Medical management is so complicated and use of atropine, oxygen and fluids is required to deliver of oxygen to the tissues. Oximes, principally pralidoxime (2-PAM), have been used as antidotes but The role of oximes is not totally obvious and they might be benefit in moderate poisoning or specific pesticides. Also produce of stable phosphoryl oximes (POXs) with high anticholinesterase activity and greater anti- serine esterases potencies than the OP inhibitors from which they were derived, causes difficult management of poisoning. Plasma high concentration of OP is one important medical problem for treatment of OP because the released inhibited cholinestrase by oximes may be re-inhibited again. Quercetin (QR) and Rutin (RT) are the nucleophile compounds with no toxicity effects. In the present study, feasibility of quercetin and Rutin administration as therapeutic agents for OP poisoning was studied and compared with 2-PAM administration in mice.

Methods: QR and RT at doses of (50, 100, 200 mg/kg) were administered intraperitoneal (ip) 15 minutes after a single intraperitoneal injection of Diazinon (DZ) (LD50=366 mg/kg). Atropine (AT; 20 mg/kg, ip) and pralidoxime (2-PAM; 30 mg/kg, ip) were used alone or together as standard therapy or controls in different (12) groups. acetylcholinesterase (AChE) and buthrylcholinesterase (BChE) were measured after three and 24 h as markers of OP toxicity. Mitochondrial function, Lipid peroxidation (LPO), Protein carbonyl (PC) and Glutathione (GLU) content were evaluated in the mice brain mitochondria.

Results: Significant increase of AChE and BChE activity were observed by the QR and RT at all doses as compared with DZ group. QR at dose of 100 mg/kg and RT at dose of 200 mg/kg significantly increased the AChEactivity and QR and RT at dose of 200 mg/kg significantly increased the BChE enzyme activity in comparison to DZ+PAM and DZ+AT after three hours. QR at doses of 100, 200 mg/kg and RT at dose of 200 mg/kg significantly increased the AChE and BChE enzyme activity in comparison to DZ+PAM, DZ+AT and DZ+PAM+AT after 24 hours. Brain mitochondria function were increased significantly by QR and RT at all doses as compared with DZ group. LPO and PC content were significantly decreased after administration of QR and RT when compared with DZ group but not with DZ+PAM group. A significant increase of GLU content was observed in the RT (100mg/kg) group when compared with DZ and DZ+PAM groups.

Conclusion: It is concluded that QR and RT are more effective than 2-PAM to reactivation and also prevention of re-inhibition of the reactivated enzyme after 3 and 24 h. High nucleophilic properties of QR and RT can be considered as the mechanism proposed for ChE reactivation. Mitochondria protective effect of the QR and RT may be due to increase of bioactive compounds, plasma antioxidants or direct scavenging of free radicals.
Oral Abstracts

3B-05

CLINICAL OUTCOME OF PARAQUAT POISONING DURING PREGNANCY

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Objectives: To analyze the clinical characteristics and outcome of paraquat poisoning in pregnant patients and fetuses.

Methods: We carried out a retrospective cohort study from Ramathibodi Poison Center Toxic Exposure Surveillance System, during a five-year period. The inclusion criteria were all pregnant cases who were exposed to paraquat.

Results: A total of 36 poisoning cases were included. Most were from the central (25%) and north regions (22.2%). All were oral exposure with the mean age of 22.7 years and mean gestational age of 23.1 weeks. The patients were in the 1st, 2nd, 3rd trimester for 9, 14 and 13 cases, respectively. Almost all cases ingested paraquat due to suicidal attempts. The median duration between the ingestion to hospital visit was about 2 hours (5 minutes-5 days). Most had gastrointestinal (GI) symptoms (77.8%) and corrosive effects (61.1%). The blood level and urine dithionite test were confirmed in 4 and 4 cases, respectively. Twelve patients (33.3%) developed systemic toxicity including acute kidney injury (AKI), abnormal liver enzyme and abnormal chest x-ray. Spontaneous abortion occurred in 2 cases, one case had the intrauterine fetal death and another one developed the uterine contraction. The medical treatment included intravenous dexamethasone (88.9%), cyclophosphamide (35.6%), vitamin-C (86.1%), N-acetylcysteine (5.6%) and oral vitamin-E (66.7%). Three patients received hemodialysis and four patients were intubated. The median length of hospital stay was 6 days (1-17 days).Nine cases delivered the babies during the hospital stay and four newborns were dead after deliveries. One dead newborn had the blood paraquat level of 19.8 at 9 hours, while the mother’s blood level was 5.61 at 31 hours after the ingestion. The mortality rate of pregnant patients was 25%.One newborns died while the mother survived. The patients who survived and did not give the deliveries during the hospital stay, were followed up for outcomes of their babies. We performed the subgroup analysis between the dead and survived group. We found that AKI, abnormal liver enzyme and the maximum white blood cell level were statistically significantly different between 2 groups. While the age, trimester of pregnancy, duration between the ingestion to hospital visit, GI symptoms, corrosive effect, the medications and the length of stay showed no statistically significant difference.

Conclusions: Paraquat poisoning during pregnancy caused high fatalities for both pregnant women and their offspring. AKI was associated with the fatality. The result of this study would help guide the management of this poisoning.
OVERVIEW OF TOXINS AND TOXICANTS IN OUR FOODS

Joanne Chan SheotHarn

Health Sciences Authority, Food Safety Division, Applied Sciences Group

Abstract: Toxins and toxicants are regularly monitored by food safety agencies throughout the world as some of these substances have significant impact on human health. While toxicants are produced artificially, toxins are produced naturally by living organisms. During the last decade, we have witnessed increasing number of food safety incidents and scandals which pose serious threats to consumers worldwide. The globalised and complex nature of our food supply chain makes food safety a challenging task and hence consumers are vulnerable to food intoxication as a result of economic adulteration activity or contamination due to climate change, agricultural practice and industrial activities such as generation of nuclear powers. This paper aims to provide an overview of the natural toxins, for example mycotoxins prevalent in food crops, toxicants such as heavy metal, processed contaminants which have accumulated in the food chain and examples of intentional adulteration such as the infamous melamine milk scandal in 2008.
Pharmacovigilance is defined as the science of and activities relating to the detection, assessment, understanding and prevention of adverse effects of drugs and related health products. Due to the limitations of pre-clinical studies and clinical trials, the safety profiles of many drugs are never fully known at the time of marketing. As such, there is a need to conduct post-marketing surveillance of marketed drugs to ensure that they continue to be safe for use.

Many post-marketing surveillance tools are employed for monitoring the safety profile of marketed drugs. Amongst these, Adverse Drug Reactions (ADR) reporting by healthcare professionals and the pharmaceutical industry has been identified as the most cost effective tool as it allows for a life cycle approach to drug safety monitoring.

This presentation will give an overview on the importance of ADR reporting and monitoring in Singapore. It will also cover the aspects on how the Health Sciences Authority (HSA) deals with these reports and the risk management framework that is in-place.

Local cases will be shared to illustrate the important role of ADR monitoring in safeguarding public health.
An important partnership exists between the production of food and ensuring safe ways of doing so. Fertilizers, pesticides, and new seed variants have more than doubled or tripled agricultural output since the 1950’s. At the same time, comprehensive testing and regulatory approaches were developed to ensure that these developing agricultural technologies could be used safely. In the 1960’s and 70’s animal-based protocols established the toxicity of active ingredients. The 1980’s and 90’s refined these protocols and introduced the concept of risk-based evaluations, which took into account potency of the toxicological effect as well as potential human exposure. The 2000’s saw the advent of in vitro and computer-based modeling of toxicity that has reduced animal testing and provided accelerated evaluation of chemicals in general and agricultural active ingredients in particular. Since the late 2000’s, new methods and approaches have increased our understanding of potential adverse effects in humans while supporting a safe and abundant supply of food. This presentation will explore the development of tests that provide a clear picture of potential human toxicity by showing how certain old and new active ingredients were developed and commercialized. Participants will gain an in-depth knowledge of how testing is done, the data that is produced and interpreted, and the sources of information for clinicians to form science-based decisions on safety and health.
Oral Abstracts

4B-01

FROM BEER TO HIPS - DIAGNOSIS AND TREATMENT OF COBALT TOXICITY

Robert S. Hoffman

New York University School of Medicine

Trace amounts of cobalt ions are essential for human life in that they are required for the synthesis of vitamin B12 (cyanocobalamin), while larger amounts have the potential for significant toxicity. Although the use of cobalt salts for intended self harm is uncommon, an understanding of cobalt toxicity can be gained by studying its early use as a hematopoietic, and the unintended consequences of the addition of cobalt to beer and its use in metal-on-metal hip implants. The major organ systems involved are the bone marrow, nervous, cardiovascular, and endocrine systems.

The first experiences with cobalt salts came from their medicinal use as a hematopoietic with one popular pharmaceutical known as Roncovite. Chronicled in 1949 in two works in the New England Journal of Medicine, toxic gastrointestinal effects were already recognized, but therapy was continued because cobalt was felt to be less toxic than iron.(1,2) By 1955 hypothyroid and thyromegaly were well described.(3,4,5)

In 1966 the first cases of “beer drinker’s cardiomyopathy” were reported.(6) Essentially simultaneous cases were noted in heavy beer drinkers in the US and Canada. Other findings included liver and thyroid disease. Although at the time, this disorder was felt to be largely nutritional and treated with supportive care and thiamine, ultimately the outbreak was traced to the intentional addition of cobalt sulfate to beer to increase the longevity of the foam. Because of experimental difficulties reproducing the cardiac effects in animals, many researchers have concluded that cardiomyopathy requires poor nutrition and/or alcoholism to occur.

The most recent experience with cobalt toxicity comes from the use of cobalt and chromium in metal-on-metal hip implants. Excessive wear and dysfunctional devices liberates metal into local tissues and ultimately enters the systemic circulation. Case reports of thyroid dysfunction, peripheral neuropathy, cardiomyopathy, and loss of hearing and sight are attributed to metal release from these devices.(7,8,9)

There are no controlled trials in humans to best guide therapy for patients with clinical findings of cobalt toxicity and elevated blood concentrations. Removal of exposure seems reasonable in cases of documented toxicity from dysfunctional orthopedic implants, but thresholds for removal based on blood concentrations are ambiguous and must be balances by operative risks. Recent evidence cast doubt on the roles of hemodialysis and therapeutic plasma exchange.(10) In animal models, early administration of EDTA and NAC show the most promise,(11,12) while another model favors DTPA(13). Human case reports suggest benefits of CaNaEDTA(14) and DMPS(15).

In conclusion based on limited data this author would suggest the use of CaNaEDTA, NAC, DTPA or DMPS depending on availability along with daily thiamine for its potential role in treating cardiomyopathy.


Learning Objectives:
1. Describe the epidemiology of cobalt poisoning
2. Explain the biochemical basis for cobalt toxicity
3. Discuss the evaluation of patients with suspected cobalt toxicity
4. Describe the best treatments for patients with cobalt toxicity
Oral Abstracts

4B-02

CHALLENGES OF ENVIRONMENTAL LEAD POISONING IN CHILDREN

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Abstract: Long-term exposure to lead can cause serious health problems, especially in young children who are more susceptible to absorbing and retaining lead in their bodies. Lead is concerned to effect the developing nervous system of children. Childhood lead poisoning has received a widely public attention health problem around the world.

After a severe lead encephalopathy pediatric case has been discovered in one industrial area in Thailand, the prototype project of blood lead level (BLL) screening and management in young children (6 month-old to 6 year-old) was carried out in that area in 2015. The medical team consisted of the clinical toxicologists, the pediatricians, the local environmental authorities with the project budget supported by the government.

The protocol for the BLL screening included the socio-demographic questionnaire, and the basic physical examination was performed. Subsequently, the BLL follow-up and environmental intervention protocol for the children was implemented. The nutrition supplement was supported in the children with high blood lead level.

Challenges and lessons learned indicate that health education, environmental management and remediation and preventive measures are important, necessary and should be concerned to minimize or prevent environmental lead poisoning. The public policy of lead screening protocol and the medical intervention should be studied more and emphasized to decrease lead exposure as the primary prevention, particularly in children.

Learning Objectives:
1. The example of the situation of environmental lead poisoning in childhood in Thailand
2. The example of the model of blood lead level (BLL) screening and management in young children
OBJECTIVES: Self-harm is a major public health problem, with adolescents particularly at high risk of self-harm behaviours. Non-fatal self-harm puts individuals at higher risk of completed suicide later in life. Self-poisoning is a common method of self-harm, accounting for 80% of self-harm hospitalisations in Australia[1]. This study aims to characterise Australian trends in fatal and non-fatal self-poisonings in children and adolescents 5-19 years old.

METHODS: The New South Wales Poisons Information Centre (NSWPIC) is Australia’s largest poisons centre, taking approximately 50% of the nation’s calls. The NSWPIC database was retrospectively reviewed for cases of intentional poisoning in the ‘Child’ (5-14 years) and ‘Adolescent’ (15-19 years) age categories, 2004-2015. To examine fatal self-poisonings, the National Coronial Information System (NCIS, containing record of all reportable deaths in Australia) was queried for poisoning deaths in people aged 5-19, 2000-2015. Cases were manually reviewed to exclude accidental poisonings, assaults, and deaths where the primary cause was non-toxicological.

RESULTS: In the 12 year study period the NSWPIC database recorded 6419 intentional poisonings in the Child age category, and 22,153 intentional poisonings in the Adolescent category. There has been a 60% increase in child/adolescent self-poisoning cases since 2011. The steepest increase was in 12-15 year olds (83% increase). Females outnumbered males 2.8:1. There appears to be a cohort effect, with increased self-poisoning by those born between 1997 and 2001. Substances most commonly used were paracetamol, ibuprofen, fluoxetine, quetiapine and sertraline. Poisonings with non-narcotic analgesics and psychotropics have increased by 41% and 75%, respectively, 2004-2015. There were 420 cases of fatal self-poisoning in people aged 5-19 (66% male), 2000-2015. There was a decline in deaths over this period. The most common agents involved in fatalities were benzodiazepines, carbon monoxide, heroin, morphine and methadone.

CONCLUSION: There has been a worrying increase in child/adolescent self-poisoning calls to NSWPIC, particularly over the past 4 years in people aged 12-15. Possible reasons for this increase include increasing prescribing of psychotropics to young people, increased internet and social media use and earlier pubertal onset. This has not corresponded with an increase in fatal self-poisoning, perhaps due to the low toxicity of agents most commonly involved. Statistically, these people are at increased risk of suicide later in life. Therefore, this could identify a generation with increasing mental health problems, and foretell future increases in Australian suicide rates.

**Oral Abstracts**

**4B-03**

**INCREASED SELF-POISONING IN YOUNG AUSTRALIANS: WHY, 2KS?**

Rose Cairns¹², Nicholas Buckley¹²

¹New South Wales Poisons Information Centre, The Children’s Hospital at Westmead, Australia; ²Pharmacology, The University of Sydney, Australia

**Objectives:** Self-harm is a major public health problem, with adolescents particularly at high risk of self-harm behaviours. Non-fatal self-harm puts individuals at higher risk of completed suicide later in life. Self-poisoning is a common method of self-harm, accounting for 80% of self-harm hospitalisations in Australia[1]. This study aims to characterise Australian trends in fatal and non-fatal self-poisonings in children and adolescents 5-19 years old.

**Methods:** The New South Wales Poisons Information Centre (NSWPIC) is Australia’s largest poisons centre, taking approximately 50% of the nation’s calls. The NSWPIC database was retrospectively reviewed for cases of intentional poisoning in the ‘Child’ (5-14 years) and ‘Adolescent’ (15-19 years) age categories, 2004-2015. To examine fatal self-poisonings, the National Coronial Information System (NCIS, containing record of all reportable deaths in Australia) was queried for poisoning deaths in people aged 5-19, 2000-2015. Cases were manually reviewed to exclude accidental poisonings, assaults, and deaths where the primary cause was non-toxicological.

**Results:** In the 12 year study period the NSWPIC database recorded 6419 intentional poisonings in the Child age category, and 22,153 intentional poisonings in the Adolescent category. There has been a 60% increase in child/adolescent self-poisoning cases since 2011. The steepest increase was in 12-15 year olds (83% increase). Females outnumbered males 2.8:1. There appears to be a cohort effect, with increased self-poisoning by those born between 1997 and 2001. Substances most commonly used were paracetamol, ibuprofen, fluoxetine, quetiapine and sertraline. Poisonings with non-narcotic analgesics and psychotropics have increased by 41% and 75%, respectively, 2004-2015. There were 420 cases of fatal self-poisoning in people aged 5-19 (66% male), 2000-2015. There was a decline in deaths over this period. The most common agents involved in fatalities were benzodiazepines, carbon monoxide, heroin, morphine and methadone.

**Conclusion:** There has been a worrying increase in child/adolescent self-poisoning calls to NSWPIC, particularly over the past 4 years in people aged 12-15. Possible reasons for this increase include increasing prescribing of psychotropics to young people, increased internet and social media use and earlier pubertal onset. This has not corresponded with an increase in fatal self-poisoning, perhaps due to the low toxicity of agents most commonly involved. Statistically, these people are at increased risk of suicide later in life. Therefore, this could identify a generation with increasing mental health problems, and foretell future increases in Australian suicide rates.

Oral Abstracts

5A-01

A RANDOMIZED CONTROLLED TRIAL OF HOT WATER (45°C) IMMERSION VERSUS ICE PACKS FOR THE TREATMENT OF PAIN IN CHIRONEXFLECKERI STINGS

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Objective: Major box jellyfish (Chironex fleckeri) stings continue to be problematic in northern Australia. Although deaths are rare, severe pain remains a major issue. Hot water has been shown to be highly effective for the pain of Physalia spp. stings. We investigated the effect of hot water immersion on the pain of C. fleckeri stings.

Methods: We undertook an open-label randomised controlled trial at a tertiary hospital in northern Australia, in patients with C. fleckeri stings, comparing hot water immersion at 45°C to ice packs. Patients (>7yr) were recruited if they had a painful box jellyfish sting. Patients were allocated in a 1:1 randomisation. The primary outcome was a clinically significant reduction in pain severity 30min after enrolment using the visual analogue scale (VAS). Secondary outcomes included cross-over to the alternate treatment, use of opioid analgesia, emergency department length of stay (LOS), proportion with recurrent pain within 24h and proportion developing papular urticarial rashes subsequent to discharge. Analysis was intention to treat.

Results: There were 46 patients recruited to the study but pain scores and treatment allocation were not recorded in four patients. Of 41 patients (median age 19y; interquartile range[IQR]; 13-27y; 26 males), 25 were allocated to ice packs and 17 to hot water immersion. Both groups had similar demographics, baseline VAS and systemic effects. Thirty minutes after treatment commenced 14/25 (56%) of patients treated with ice packs had clinically improved pain compared to 11/17 (65%) treated with hot water immersion [absolute difference: 9%; 95%CI: -22 to 39%; p=0.75). One patient in the ice pack arm was crossed over to hot water immersion. Two patients in each arm were given intravenous opioid analgesia. The medial emergency department LOS for patients treated with ice packs was 1.6h (IQR: 1 to 1.8h) compared to 2.1h (IQR: 1.6 to 2.8h;p=0.07). No patients represented with recurrent pain. Only seven patients were able to be followed up, and 5 of these developed delayed hypersensitivity rashes.

Conclusion: Hot water immersion was no better than ice packs in the treatment of acute pain in Chironex fleckeri envenoming. The use of hot water immersion increased the length of stay by about 30min.
Remote Envenomation Consultancy Services (RECS) — The Malaysian Experience

Ahmad Khaldun Ismail

Abstract of Emergency Medicine, Hospital Canselor Tuanku Muhriz

Abstract: The speaker will bring the attention of the audience to the current issues pertaining to Clinical Toxinology in Malaysia and the clinical management support for animal bites and stings (poisoning) with particular emphasis on snakebite envenoming for Malaysia and neighboring countries.

Learning Journey:
1. To identify the issues with Clinical Mx of envenoming (poisoning) in Malaysia
2. To introduce the objectives of Remote Envenomation Consultancy Services (RECS)
3. To share some of the experiences, challenges and success of RECS MY

Methods: The consultation log of the primary RECS consultant was reviewed and analyzed. Data was descriptively presented.

Results: The number of RECS consultation has been increasing every year since its establishment in 2012.

Conclusion: This reflects a strong demand for RECS in Malaysia.
Abstract: Snake envenomation is a neglected tropical disease. The number of snake envenomings in the region is estimated to be very high and is reported to account for 60% of global snake bite burden and more importantly the region accounts for up to 77% of global snake bite related deaths. A recent survey in Sri Lanka estimated that the crude overall incidence of snake bite is around 400/100,000 per year. The morbidity associated with snake envenoming has not even been properly estimated and includes pain, amputations, psychological effects and loss of earning.

The standard of care is administration of species specific antivenom. At present antivenom administration is many hours delayed as the indications of antivenom administration is based on development of complications such as coagulopathy. There are no surrogate markers of envenoming that will guide the physician early administration of antivenom.

The region lacks species specific antivenom. Many countries use a polyvalent antivenom manufactured in India using venom of snakes of India. Further, the safety of available antivenom in the region has been questioned due to high incidence of adverse reactions including anaphylaxis. Another major issue is that some of the venomous snake bites e.g. Hypnalespp are treated with supportive care only as there is no antivenom available at all.

The need of the region is to develop species specific antivenom using venom of medically important snakes of each country. Further, improved technology should be used to ensure safety of such antivenom. International research collaborations with new technologies is the way forward. Sri Lanka has recently been able to produce a species specific effective antivenom in collaboration with Instituto Clodomiro Picado of Costa Rica and Animal Venom Research Internation of USA.

Learning Objectives:
1. Identify that snake envenomings is a neglected tropical disease
2. List issues of management of snake bite
RECOVERY OF VENOM INDUCED CONSUMPTION COAGULOPATHY (VICC) IN RUSSELL’S VIPER (DABOIARUSSELII) ENVENOMING: DOES ANTIVENOM PLAY A ROLE?

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Abstract: There remains controversy regarding the effectiveness of antivenom for venom induced consumption coagulopathy (VICC) in snake envenoming, with no placebo controlled trials. Observational studies suggest antivenom speeds recovery for *Echis* sp. but not Australian elapids. This study investigates the effect of Indian Polyvalent Antivenom on VICC in Sri Lankan Russell’s viper envenoming.

Methods: From a cohort of 245 authenticated Russell’s viper bite patients admitted to Teaching Hospital, Anuradhapura, Sri Lanka over 14 months, cases with detectable venom concentrations and serial coagulation studies were included. Time related changes in venom concentrations, prothrombin time (PT)/International normalized ratio (INR), activated partial thromboplastin time (aPTT) and fibrinogen in patients who received antivenom (AVG) versus those not receiving antivenom (NAVG) were compared. The decision to administer antivenom was made by the treating physicians, based on clinical features of envenoming and the whole blood clotting time (WBCT).

Results: There were 82 AVG [median age: 40 (range: 16-70); 61 males] and 16 NAVG [median age: 48 (range: 16-70); 11 males]. The AVG received the first dose of 20 vials antivenom a median of 3.5h (IQR, 2.5-4.5h) post-bite. AVG had significantly higher peak venom concentrations (median,150ng/ml; IQR:37-624ng/ml) compared to NAVG (median,16ng/ml; IQR:4.4-28ng/ml;p<0.05, Mann-Whitney test). The WBCT was prolonged in 69 (84%) of the AVG on day 1 compared to none in NAVG. Neurotoxicity developed in 63 (77%) of the AVG compared to none in NAVG. Administration of antivenom resulted in a rapid decrease in circulating venom concentrations in all AVG patients, with 73% having undetectable venom 24h post-bite. The maximum INR, aPTT and lowest fibrinogen were significantly higher in AVG compared to NAVG (p<0.05, Mann-Whitney test). Further, 35 (43%) of AVG developed complete VICC compared to none in NAVG. There was a significant decrease in INR and aPTT and an increase in fibrinogen between 12-24h, and also 24-48h in AVG (p<0.05, Wilcoxon test). There was no significant change in the INR, aPTT and fibrinogen between 12h-24h, and 24h-48h in NAVG (p>0.05, paired t test). The median PT and fibrinogen normalized at 48h and median aPTT at 72h in AVG. At 48h, none of these parameters were normalized in NAVG.

Conclusion: Although more severe envenoming and VICC occurred in AVG, recovery of VICC was faster compared to NAVG, suggesting antivenom speeds recovery of VICC in Sri Lankan Russell’s viper envenoming. However, bias associated with the low sample size in NAVG cannot be excluded.
Oral Abstracts

5B-01

LIVER X RECEPTOR AGONIST TO901317 ATTENUATES PARAQUAT-INDUCED ACUTE LUNG INJURY THROUGH INHIBITION OF NF-KB AND JNK/P38 MAPKS SIGNAL PATHWAYS

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Objectives: To investigate the effects and possible underlying mechanisms of TO901317, a potent Liver X receptors (LXRs) receptor ligand, against paraquat (PQ)-induced acute lung injury (ALI) in mice.

Methods: Male C57BL/6J mice were injected with PQ (28 mg/kg, ip), TO901317 (5 or 20 mg/kg, ip) was administered 30 minutes after PQ exposure. Bronchoalveolar lavage fluid (BALF) was collected at 6, 12, 24 and 72 h after PQ exposure for protein concentration and cytokines measurement. Lung tissues were collected at 72 h after PQ exposure to determine the wet-to-dry (W/D) ratios, histopathology changes, antioxidant capacity, cell apoptosis as well as the protein levels of LXRα, LXRβ, NF-κBp65, IκB-α, JNK, p38 MAPK, Bax and Bcl-2.

Results: PQ exposure induced ALI characterized by significant tissue damage and edema, neutrophils (PMNs) infiltration and increased production of proinflammatory cytokine, such as tumor necrosis factor-α (TNF-α) and interleukin-1β (IL-1β), in the BALF. PQ administration also decreased the antioxidant capacity by reducing superoxide dismutase (SOD), catalase (CAT) and glutathione S-transferases (GSTs) activities, as well as increasing lipid peroxidation damage evaluated by malondialdehyde (MDA) levels. Furthermore, PQ administration induced upregulation of pro-apoptotic gene Bax and downregulation of anti-apoptotic gene Bcl-2, which leads to significantly increased cell apoptosis in the lung tissues. However, TO901317 pretreatment reversed all these parameters via inhibition of PQ-induced NF-κB and JNK/p38 MAPKs activation.

Conclusion: Our results imply that LXR agonists TO901317 showed potent antioxidant, anti-inflammatory and anti-apoptotic effects against PQ-induced ALI.
ORAL ABSTRACTS

5B-02

SILYMARIN ATTENUATES PARAQUAT-INDUCED LUNG INJURY VIA NRF2-MEDIATED PATHWAY IN VIVO AND IN VITRO

Feng ZHAO

The present study aims to investigate the impacts and mechanisms of silymarin on paraquat (PQ)-induced lung injury in vivo and in vitro. In vivo experiments, a total of 32 male Sprague-Dawley (SD) rats were randomly divided into 4 groups. The rats were sacrificed on day 3 after PQ intoxication. Histopathological changes in lung tissue were examined using HE and Masson's trichrome staining. Biomarkers of neutrophil activation, pulmonary oedema, pulmonary fibrosis, lung permeability and oxidative stress were detected. Several proinflammatory mediators and antioxidant related proteins were measured. In in vitro experiments, A549 cells were transfected with Nrf2 special siRNA to investigate the roles of Nrf2. Our results showed that silymarin administration abated PQ-induced lung histopathologic changes, decreased inflammatory cell infiltration and lung wet weight/dry weight (W/D) ratio, suppressed myeloperoxidase (MPO) activity and nitric oxide (NO)/inducible nitric oxide synthases (iNOS) expression, downregulated malondialdehyde (MDA) and hydroxyproline (HYP) levels, and reduced total protein concentration and the release of proinflammatory mediators. Meanwhile, treatment with silymarin upregulated the expression levels of nuclear factor-erythroid-2-related factor 2 (Nrf2), heme oxygenase-1 (HO-1) and NAD(P)H:quinone oxidoreductase-1(NQO1). However, the addition of Nrf2 siRNA reduced the expression of Nrf2-mediated antioxidant protein HO-1 and thus reversed the renalprotective effects of silymarin against oxidative stress and inflammatory response. These results suggest that silymarin may exert protective effects against PQ-induced lung injury. Its mechanisms were associated with Nrf2-mediated pathway. Therefore, silymarin may be a potential therapeutic drug for lung injury.
Oral Abstracts

5B-03

ANTIOXIDANT THERAPY ON PARAQUAT INDUCED PULMONARY INJURY; QUANTIFIED WITH HUMAN CLARA CELL PROTEIN ELISA

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Objectives: The major cause of death in paraquat (PQ) poisoning is respiratory failure due to an oxidative insult to the alveolar epithelium. There is no proven effective treatment for PQ poisoning. Therefore we aimed to see whether antioxidant therapy would improve PQ induced lung injury, quantified by Human Clara Cell Protein (HCC) ELISA

Methods: Patients admitted following acute PQ ingestion were recruited to the treatment group of the study and randomized in to two arms. One arm was treated with intravenous vitamin C (vitC)+N-acetylcysteine (NAC) and the other was treated with vitC+placebo. The dose of vitC was 100, 500, 1000, 3000mg/day and 3000mg/8h for five consecutive days. The NAC dose was 20mg/kg followed by 50mg/kg twice per day for three days. The placebo was 5% dextrose administered twice per day for three days. The treatment group was compared to controls who received standard supportive treatment. HCC was used as lung biomarker to determine lung injury. Mann-Whitney U test was used to compare the groups and Log Rank and Tarone-ware tests were used to analyze the survival function.

Results: The mean (SD) ages of the treatment (n=40) and controls (n=80) were 33(17) and 36(16) years. The median survival time of the patients in the treatment and control groups were eight days (95%CI 1.8-14.2) and 10 days (95%CI 3.0-16.9). The median survival time of the patients given VitC+placebo and Vit C+NAC was seven days (95%CI 0-20) and eight days (95%CI 2–14) respectively. The median (IQR) PQ level at 12 hours of ingestion in the treatment and control groups were 5.0(10.8) and 9.1(15.7)µg/mL (P=0.3). Plasma HCC concentration of treatment group was lower than that of the controls over five consecutive days (except day four). Statistically significant difference in HCC was observed in day one (treatment group 8.5(4.5-11.8)€ng/mL vs controls 15.3(7.1-27.4)€ng/mL;P=0.02) and day two (treatment group 8.2(25-10.5)€ng/mL vs controls 12.1(8.7-25.4)€ng/mL;P=0.006). Comparison of two arms in the treatment group showed higher levels of HCC in the patients who received VitC+NAC than that of the patients who received VitC+placebo. Statistically significant higher levels of HCC was detected in the patients who received VitC+NAC on day four (VitC+NAC arm 26(12.5-67.5)€ng/mL vs VitC+placebo arm 7.4(4.8-22.2)€ng/mL;P=0.02) and day five (VitC+NAC arm 25(5.6-28.4)€ng/mL vs VitC+placebo arm 3.2(2.8-6.4)€ng/mL;P=0.02).

Conclusion: Intravenous VitC therapy showed promising effect on lung injury induced by PQ. Addition of NAC causes harm than the benefit.

€ Values are median (IQR)
Oral Abstracts

5B-04

CHANGING OLEANDER (THEVETIA PERUVIANA) POISONING PATTERNS IN SRI LANKA AND NOVEL RISK FACTORS

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Objectives: Suicide via poisoning in low-income countries is common, and Sri Lanka had a very high rate of 47 suicides per 100,000 in 1995. Changing epidemiology of modes of self-harm appear to be occurring with a reduction in pesticide poisoning and increase in medicinal overdose. This study examines the epidemiology of oleander poisonings in this context, recorded at presentation to ten Sri Lankan hospitals.

Methods: Data was collected as part of an ongoing toxicology prospective cohort of all toxin self-poisonings recruited at ten hospitals across Sri Lanka. A range of demographic, treatment and outcome data was collected allowing trends from 2002-15 to be assessed over time in different parts of the country. Cases examined were those involving a single poison (±alcohol). Case-fatality was calculated, and cases from different regions of the country were compared and contrasted.

Results: Case-fatality for presenting oleander cases was 2.6% (95% CI: 2.2, 2.9). Case-fatality in the first 12 months of the study (5.8%, 95% CI: 4.4, 7.4) was significantly higher than the last 12 months case-fatality (1.0%, 95% CI: 0.4, 2.3) and regressing case-fatality against time saw a decrease in case-fatality over time since the commencement of data collection in 2002 (p<0.001). Over the time period 15.0% of all poisoning cases were oleander poisonings (of total of 72,601 cases), with patients’ average age 24.6 years (±SD 10.4) and 50.7% were male. In the 10-20 year age group, only 40.9% were male (compared with 59% male in the 20-60 year group). Co-ingestion of alcohol may increase the risk of fatality after adjusting for age (OR 1.5 [95% CI: 0.99, 2.4]). The proportion of oleander cases receiving charcoal was reduced from 65% to 40% 2002-2016 at Anuradhapura and Kurunegala (p<0.05), but not Polonnaruwa. Use of atropine in treatment decreased over the study period but did so at different rates in different hospitals. Certain areas had proportionally higher numbers of cases, and higher case-fatality. Hospitals in dry and intermediate climatic zones reported a higher proportion of oleander cases than those in wet climatic zone. The higher case-fatality found during dry seasons could be due to increased toxicity of oleander, or increased dose, with the availability of seeds.

Conclusion: Improved care of patients presenting at Sri Lankan hospitals has seen a decrease in case-fatality. Young women are the group with highest rate of oleander poisoning, compared to other modes of self-harm. Yellow oleander toxicity may vary by region and season.
6A-02

CARDIAC GLYCOSIDES: HOW TO OPTIMIZE ANTI-DIGOXIN FAB FRAGMENTS?

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Objective: There are controversies regarding the use and dose of anti-digoxin specific antibody (Digoxin Fab) in digoxin and cardiac glycoside poisoning. In this talk, we describe the use of digoxin specific antibodies (Digoxin Fab) in acute and chronic digoxin poisoning and cardiac glycoside toxicities.

Learning Objectives:

1. To recognize the signs & symptoms of severe digitalis toxicity.
2. To rationalise and titrate the use of digoxin Fab in digoxin poisoning.
3. To understand when anti-digoxin specific antibodies are indicated in cardiac glycoside poisoning.

Methods: To discuss the use and effectiveness of digoxin Fab in two prospective studies on acute and chronic digoxin poisoning. This will be contrasted against traditional teaching on the use of digoxin Fab in digoxin and cardiac glycoside poisoning.

Results: In acute digoxin poisoning, Digoxin Fab may be given in staggered doses in the first 24-48h, titrated against ECG changes and clinical response. In chronic digoxin poisoning, one or two vials of digoxin Fab bound all free digoxin but the median change of heart rate is only modest following the administration of Digoxin Fab. Free digoxin concentration reduced to almost zero following the administration of digoxin Fab but there is a rebound of free digoxin that may not be clinically significant.

Conclusions: Digoxin Fab in staggered doses are effective in managing arrhythmias in acute digoxin overdoses. In chronic digoxin toxicity, it is not as effective in managing brady-arrhythmia. It is not clear regarding the optimal dose of digoxin Fab in the management of cardiac glycoside poisoning.
**Oral Abstracts**

**6A-03**

**CARDIAC GLYCOSIDES: HOW TO OPTIMIZE ANTI-DIGOXIN FAB FRAGMENTS?**

Betty Chan¹, ², Angela Chiew¹, ², Nicholas Buckley²,³

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**Objective:** There are controversies regarding the use and dose of anti-digoxin specific antibody (Digoxin Fab) in digoxin and cardiac glycoside poisoning. In this talk, we describe the use of digoxin specific antibodies (Digoxin Fab) in acute and chronic digoxin poisoning and cardiac glycoside toxicities.

**Learning Objectives:**
1. To recognize the signs & symptoms of severe digitalis toxicity.
2. To rationalise and titrate the use of digoxin Fab in digoxin poisoning.
3. To understand when anti-digoxin specific antibodies are indicated in cardiac glycoside poisoning.

**Methods:** To discuss the use and effectiveness of digoxin Fab in two prospective studies on acute and chronic digoxin poisoning. This will be contrasted against traditional teaching on the use of digoxin Fab in digoxin and cardiac glycoside poisoning.

**Results:** In acute digoxin poisoning, Digoxin Fab may be given in staggered doses in the first 24-48h, titrated against ECG changes and clinical response. In chronic digoxin poisoning, one or two vials of digoxin Fab bound all free digoxin but the median change of heart rate is only modest following the administration of Digoxin Fab. Free digoxin concentration reduced to almost zero following the administration of digoxin Fab but there is a rebound of free digoxin that may not be clinically significant. Conclusions: Digoxin Fab in staggered doses are effective in managing arrhythmias in acute digoxin overdoses. In chronic digoxin toxicity, it is not as effective in managing brady-arrhythmia. It is not clear regarding the optimal dose of digoxin Fab in the management of cardiac glycoside poisoning.
Oral Abstracts

6B-01

ANALYSIS OF THE EFFICACY OF TAIWAN FREEZE NEUROTOXIC ANTIVENOM AGAINST SOUTHEAST ASIA COBRA VENOMS THROUGH ANIMAL MODEL AND PROTEOMICS APPROACHES

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Objectives: According to WHO’s estimation, Southeast Asia is one of the highest burdened regions of snakebites envenomation. In Southeast Asia, there are 4 clinical significant cobras envenoming: Ophiophagus hannah (OH), Naja kaouthia (NK), Naja siamensis (NS), and Naja atra (NA). Antivenom, the rational and most effective treatment modality, is either unavailable or unaffordable in many affected regions. Snakes belonging to the same species have the similar composition of venom between each other owing to the evolution process. Therefore, either monovalent or polyvalent antivenoms may offer paraspecific protection against several snakes envenoming. In Taiwan, we have freeze neurotoxic antivenom (FN-AV) to against Bungarus multicinctus and Naja atra snakebites. This FN-AV is effective and safe antivenom to treat Taiwan cobra snakebites. Based on the above phenomena, we, therefore, aim to evaluate the neutralizing ability of FN-AV against the other 3 kinds of Southeast Asia cobras in this study. Besides, we also aim to explore the toxic proteins of these 3 Asia cobras.

Methods: First, we applied WHO-recommended pre-clinical tests to evaluate the neutralizing ability of FN-AV against the 3 heterologous venoms of Southeast Asia cobras, Ophiophagus hannah, Naja kaouthia, and Naja siamensis. Second, we used mass spectrometry (MS)-based proteomic technologies to characterize venom proteomes and identify FN antivenom-recognizable antigens in the venoms of these 3 Asia cobras.

Results: Neutralization study in mice model (WHO-recommended pre-clinical tests) showed that FN-AV was able to neutralize the lethality of NK and NS venoms effectively, but not OH venom. According to MS-analysis, FN-AV antivenom-recognizable antigens, i.e. potential major toxic proteins of the venoms of NK and NS were identified. Although the OH venom cannot be neutralized by FN-AV, however, the major candidate toxic proteins of OH venom were also identified by MS-analysis.

Conclusion: FN-AV has potential application in the treatment of NK and NS envenomation. The identification of FN antivenom-recognizable antigens represents a solid basis to further develop more effective antivenom by blocking the toxicity from these major toxic proteins, in the hope of achieving broadly therapeutic effects of cobra snakebite in Southeast Asia region.
Oral Abstracts

6B-02

PROTEOMIC CHARACTERIZATION OF UNIQUE VENOM COMPONENTS AND DEVELOPMENT OF SANDWICH ELISA FOR DIAGNOSING CLINICALLY SIGNIFICANT SNAKE ENVENOMATION IN TAIWAN

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Objectives: Taiwan is an island located in the south Pacific, a subtropical region that has 61 species of snakes. In clinical envenomation, more than 90% of victims were bitten by four snakes, Trimeresurus stejnegeri (TS), Protobothrops mucrosquamatus (PM), Bungarus multicinctus (BM) and Naja atta (NA). Owing to the antivenoms are available, the mortality of snakebite is less than 1% in Taiwan. Currently, there are two types of bivalent antivenom including hemorrhagic antivenom against the venom of TS and PM, and neurotoxic antivenom treating envenomation by BM and NA. However, there are no suitable detection kits guiding the physicians to use the antivenom precisely. Therefore, the present study aimed at identifying the species-specific proteins as snakebite biomarkers and developing a diagnosis assay for improving clinical management of snakebite in Taiwan.

Methods: A two-step of affinity purification was set up for generating neurotoxic species-specific antibodies (NSS-Ab) and hemorrhagic species-specific antibodies (HSS-Ab). Then, these two SS-Ab were used to develop a sandwich ELISA which could distinguish the venom from neurotoxic snakes (BM & NA) or hemorrhagic snakes (TS & PM) in human plasma. Snakebite animal models of 4 venomous snakes were used to confirm the feasibility of this ELISA for detecting venom in biological samples. Additionally, the four snake venom proteomes were characterized by liquid chromatography-tandem mass spectrometry analysis (LC-MS/MS), and the protein components recognized by HSS-Ab and NSS-Ab were respectively identified.

Results: Our approach could purify SS-Ab and successfully develop ELISA to discriminate between neurotoxic and hemorrhagic snakebite. The limit of quantification (LOQ) of the ELISA for neurotoxic venom and hemorrhagic venom was determined as 0.39 and 0.78 ng/ml, respectively, and the venom concentration in envenomation model’s plasma ranged from 7 to 600 ng/ml, depending on the species of snake. Using Western blot analysis in conjunction with LC-MS/MS analysis, we have identified several venom proteins as the antigens specifically recognized by the NSS-Ab and HSS-Ab, respectively.

Conclusion: We herein presented a feasible strategy to develop sensitive sandwich ELISAs for detecting and differentiating venom proteins between TS/PM and BM/NA. Moreover, we also identified several species-specific proteins as the major antigens recognized by the purified SS-Ab. Knowing the identities of these SS-Ab-recognizable antigens can facilitate the development of new antivenom for snakebite treatment and management in the near future.
Oral Abstracts

6B-03

CLINICAL SPECTRUM OF SNAKE ENVENOMATION IN TAMIL NADU: THE IMPORTANCE OF RUSSELL’S VIPER ENVENOMATION

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Objectives: Viperidae bites are the predominant cause of snake envenomation in South India and Russell's viper bite leads to high rate of complications. We aimed to prospectively document the clinical syndromes, complications, ASV requirements and allergy/anaphylaxis with focus on Viper bite syndromes.

Methods: Prospective clinical study; Snake bite, age > 15 years presenting to CMC, Vellore over 2 years (2014-16). Patients observed daily till discharge/death. Description of clinical syndrome, complications, ASV requirement and allergy/anaphylaxis. Envenomation Syndromes: Viper-Haemotoxic syndrome; Probable Russell’s viper -combinations of haemotoxicity with neurotoxicity and/or acute kidney injury (AKI); Cobra bite- Neurotoxicity with local swelling; Krait bite- Neurotoxicity without local swelling.

Results: Background: total 167 patients; median age- 38 years (15-68); Two thirds males; 75.59% (n=126) referred cases with prior ASV treatment. Snake species identified in 13 cases (7.78%) (Daboiarussellii -4, Echiscarinatus- 2, Najanaja- 3, Bungarus caeruleus-2. Biting species correlated to above syndromes. Distribution of Envenomation syndromes ( Table 1). 127 (76.05%) had viper bite syndrome and 30 (17.97%) Elapidae syndromes. Of the viper bites 101 (79.53%) had probable Russell’s viper envenomation. 10 (5.99%) patients had only local envenomation.

Differences in neuroparalysis spectrum (Table 2) Ptosis and ophthalmoplegia occurred in the majority of both Russell’s viper envenomation and Elapidae syndromes. Russell’s viper envenomation syndrome was associated with lower frequency of bulbar, respiratory and limb weakness and shorter duration of paralysis. Venom induced consumptive coagulopathy (VICC) requiring blood transfusion -Among patients with VICC (n=97), 4 patients (21.05 %) with pure hemotoxic syndrome and 39 patients (51.32%) with probable Russell’s viper syndrome required blood transfusion.

AKI requiring dialysis Of the probable Russell’s viper envenomation (n=101), 60 (59.4 %) developed AKI and 34 (33.7%) required dialysis.

Mortality All the 5 deaths (mortality rate -2.99%) had probable Russell’s viper envenomation.

ASV requirement Median ASV requirement: Pure haemotoxicity-14 vials (9-30); ProbableRussells viper envenomation-18 vials (0-44); Elapidae bites- 12 vials (5-32).

ASV hypersensitivity 54 patients had ASV hypersensitivity (33.54%), itching- 52 (94.54%); urticaria-41(74.55%); bronchospasm 20 (36.36%) and anaphylaxis 16 (29.09%).
Conclusion:
1. Russell’s viper envenomation syndrome is the most frequent and important cause of morbidity and mortality in snake envenomation in Tamil Nadu.
2. Neuroparalysis with Russells’ viper envenomation is shorter with lower frequency of bulbar paralysis, respiratory and limb weakness.
3. Russell’s viper envenomation is associated with high rate of requirement of blood product transfusion and haemodialysis and increased antivenom dose suggesting relative inefficacy of ASV.

Table 1- Distribution of Envenomation syndromes

<table>
<thead>
<tr>
<th>Envenomation syndromes</th>
<th>n (%)</th>
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<tbody>
<tr>
<td>Pure haemotoxicity</td>
<td>26 (15.57%)</td>
</tr>
<tr>
<td>Haemotoxicity with AKI (No neuroparalysis)</td>
<td>15 (8.98%)</td>
</tr>
<tr>
<td>Haemotoxicity with neuroparalysis (No AKI)</td>
<td>44 (26.34%)</td>
</tr>
<tr>
<td>Haemotoxicity with neuroparalysis and acute kidney injury</td>
<td>42 (25.15%)</td>
</tr>
<tr>
<td>Neurotoxicity with local reaction</td>
<td>18 (10.78%)</td>
</tr>
<tr>
<td>Pure neurotoxicity without local reaction</td>
<td>12 (7.19%)</td>
</tr>
</tbody>
</table>

Table 2- Differences in neuroparalysis spectrum

<table>
<thead>
<tr>
<th>Pattern of neuropathy</th>
<th>Probable Russell’s viper syndrome (Haemotoxicity + Neurotoxicity)</th>
<th>Probable Krait bite (Pure neuroparalysis)</th>
<th>Probable Cobra Bite (Neuroparalysis +local swelling)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%) duration</td>
<td>Median</td>
<td>n (%) duration</td>
</tr>
<tr>
<td>Ptosis</td>
<td>81 (98.78%)</td>
<td>3 days</td>
<td>12 (100%)</td>
</tr>
<tr>
<td>Ophthalmoplegia</td>
<td>63 (76.82%)</td>
<td>4 days</td>
<td>10 (83.3%)</td>
</tr>
<tr>
<td>Bulbar muscle weakness</td>
<td>26 (31.71%)</td>
<td>2 days</td>
<td>6 (50%)</td>
</tr>
<tr>
<td>Respiratory muscle weakness</td>
<td>23 (28.05%)</td>
<td>Not assessed</td>
<td>8 (66.67%)</td>
</tr>
<tr>
<td>Limb weakness</td>
<td>5 (6.1%)</td>
<td>2 days</td>
<td>4 (33.33%)</td>
</tr>
</tbody>
</table>
Oral Abstracts

6B-04

EPIDEMIOLOGY AND OUTCOME OF SNAKEBITES IN THE PERIPHERAL HOSPITALS IN NORTH WESTERN PROVINCE OF SRI LANKA

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Objectives: Sri Lanka has rich fauna of snakes and records substantial numbers of snakebite annually. The island has three climatic zones (dry, intermediate and wet) where North Western Province (NWP) bounds both dry and intermediate zones. Breaking the tradition of studying snakebite epidemiology in tertiary care hospitals, for the first time, this study aimed to study epidemiology and outcome of snakebite in all peripheral hospitals in the Kurunegala district in NWP.

Methodology: The district has 44 peripheral hospitals and a tertiary care hospital—Teaching Hospital, Kurunegala (THK). As part of a prospective study we recorded all snakebite admissions to peripheral hospitals and their outcome, particularly the transfers to THK occurring in one year. The hospital records were scanned and reviewed independently by an expert in the field.

Results: There were 2186 admissions of snakebites with population incidence of 133/100,000. Median age was 40 years (IQR 27-53), and 59% were males. Median time to hospital arrival was 45 minutes (IQR 30-90) and 49% of bites occurred between 6pm and 12am. The offending snake was identified in 978(44.73%) cases: 64 non-venomous snakes and 914 venomous snakes. The venomous snakebites included 823 hump-nosed viper (Hyponalespp), 61 Russell’s viper, 14 cobra, 13 common krait, 03 saw scaled viper. Antivenom serum (AVS) was given to 70 (3.2%) patients and 22 (31.43%) of them developed adverse drug reactions. There were no deaths. Of the total, 399(18.25%) patients were transferred out from peripheral hospitals. The expert opinion suggested 341 (85.46%) as unnecessary transfers. Of the transfers, THK received 294 cases. Case records of 177 were available for analysis and of them, only 30 cases (17%) received AVS proving the fact of unnecessary transfers. 54 patients had AVS hypersensitivity (33.54%). Itching- 52 (94.54%); urticaria-41 (74.55%); bronchospasm 20 (36.36%) and anaphylaxis 16 (29.09%).

Conclusions: Peripheral hospitals received a significant number of snakebites that would be missed in surveys conducted in tertiary hospitals. The majority of the snakebites were treated appropriately in the primary hospital with only a few needing AVS therapy. Most of the transfers were unnecessary causing wastage of resources and money. Further education and confidence building in management of snakebite is recommended.
Venomous Snakes of Medical Relevance in Nepal: Study on Species, Epidemiology of Envenoming and an Assessment of Risk Factors of Envenoming and Death

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Objectives: To provide an evidence-based list of the medically relevant snake species and describe circumstances, socio-economic condition and prehospital interventions used for proven krait and Russell’s Viper bites.

Methods: In a cross-sectional study I taxonomically identified 349 preserved snake specimens brought by patients bitten or their attendants to nine snakebite treatment centres in southern Nepal over a period from 2010 through 2014. I analyzed the eco-epidemiology and patients’ demographic and socio-economic characteristics and the pre-hospital history of proven 46 krait and 10 Russell’s Viper bites using mixed research methods and face-to-face interviews of the patients at the site of bite during November 18, 2011 through December 31, 2014.

Results: Of 349 snakes involved in bites, 199 (57%) specimens were found to be medically relevant venomous snakes that included 11 species. Among them, Naja naja (n = 76, 22%), Bungarus caeruleus (n = 65, 19%) and Trimeresurus albolabris (n = 10, 3%) were the most widely distributed snakes. Daboia russelii (n = 10, 3%) was found to be restricted to the southwestern part of Nepal. For B. walli, a previously poorly known species, 13 voucher specimens represent the first country records of this species.

Indoor at night (61%) while sleeping during the rainy season was the main risk for krait and day hours while engaged in agricultural activities in rural areas for Russell’s Viper bites. Unlike Russell’s Vipers, kraits pose a risk of bite to people living in rural to urban areas, in all types of houses, and having higher socio-economic status, too. This suggests krait bites to be no longer a disease of the poor in Nepal. These snakes predominantly affected farmers. The case fatality rate due to krait bite envenoming was 17%. There was no death due to Russell’s Viper bites. The overall case fatality rate was calculated to be 10%.

Conclusion: The results of this study strongly emphasize that snake bite is an important public health issue in Nepal. Bungarus walli and Daboia russelii bites represent the first proven envenoming in Nepal. Since Indian antivenoms for treating envenoming are scarce and exhibit unproven cross-reactivity with venoms from Nepalese snake species, there is an urgent need to improve the knowledge of people on snakes and to try changing their attitudes towards these reptiles, in addition to documenting the biodiversity and distribution of medically relevant snakes, the epidemiology and circumstances of their bites.

Keywords: snake bite, krait bite, Russell’s Viper, Daboia russelii, Bungarus, eco-epidemiology
NEW MUSHROOM POISONING SYNDROME IN CHINA

Tse Man Li

Abstract: Mushroom poisoning is the most important cause of food poisoning-related deaths in China. In the past few years, 2 types of less well-reported mushroom poisoning occurred annually with an apparent upward trend. One was porcini mushroom which was usually dried and packed for packing for selling in markets or supermarkets. The resultant poisoning syndrome was either early onset gastrointestinal and/or hallucinogenic that lasted for days. The cause was due to undifferentiated collection of both toxic and non-toxic Boletacea in the manufacture of porcini mushroom. The other mushroom poisoning syndrome that was increasingly reported in China since 2013 was of the rhabdomyolytic type. The clinical presentation was usually severe with a reported mortality up to >50%. The causes of death were toxic myocarditis and multi-organ failure. The cause of poisoning was mistaking the toxic Russulasubnigricans for other edible Russula species. The last was known as the Yunan sudden death syndrome associated with the consumption of Trogiavenenata reported since 1978. The syndrome involved sudden deaths that clustered in time and place with an apparent familial trend that happened in villages in Yunan. Although the toxicological mechanism had not been worked out, epidemiological evidence and reduction in incidence after educational effort against consumption of the mushroom were supportive of the causation.
Oral Abstracts

7A-02

MUSHROOM POISONING – THE TAIWAN EXPERIENCE

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Introduction: Accidental mushroom poisoning is constantly seen and regularly reported from all over the world. This study aimed to review the clinical profile, source and treatment outcome of mushroom poisonings incidents and to point the importance of mushroom poisonings in Taiwan.

Methods: A retrospective descriptive/epidemiologic study was conducted by the Taiwan Poison Control Center and involved all cases of mushroom poisoning reported to the Center from July 1986 through June 2016.

Results: Overall, totally 253 cases, belonging to 114 incidents, of suspected mushroom poisoning were reported. All poisonings were accidental, the source of mushroom were wild (85%), purchased from market (8%) or unknown (7%). Most poisoning cases occurred during rainy season from May to September with a frequency of 74%. The latent period for the symptoms were between 10 minutes and 6 hours for most cases, 7 hours in 3 and 12 hours in 3. Of these, 91% cases presented with gastrointestinal symptoms of nausea, vomiting, diarrhea, or abdominal pain. Chlorophyllum molybdates were responsible for most gastrointestinal toxidrome. Gastrointestinal symptoms were usually early onset and most cases recovered after symptomatic treatment and a short duration of hospital care. Other symptoms less recorded were dizziness, fever, chills, drowsiness, cold sweating, salivation, abdomen fullness, hypotension, chest tightness, hallucination, unconsciousness, weakness, myalgia, oliguria, jaundice, etc. No death was observed. In follow up recovery was complete in all subjects. Severe or life-threatening cases were related to Russulasubnigricans, Amanita smithiana and Amanita virosa poisoning. In all severe cases, the poisonous mushroom had been picked from the wild.

Conclusion: Most cases of mushroom poisoning in Taiwan presented with gastrointestinal symptoms and followed a benign course. Severe poisoning are occasionally seen. As most cases are poisoned following consumption of wild mushrooms, careful discrimination and ingestion of wild mushrooms are mandatory in further prevention of mushroom poisoning in Taiwan.

Learning Objectives
1. Under mushroom poisoning is an important medical emergency that may have serious clinical outcome.
2. Identify possible toxic mushroom ingestions by presentation.
   - Differentiate between non-life-threatening and potentially life-threatening ingestions.

Conclusion: The public should be informed about the probable hazards of wild mushroom ingestion. The precise history of the patient and the collecting of mushroom remnants may help to identify the particular mushroom.
Oral Abstracts

7A-03

NOVEL ANTIDOTES FOR AMANITA PHALLOIDES POISONING

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Hepatotoxic mushroom poisoning is reported worldwide and Amanita phalloides (Death Cap) is the key culprit. Toxicity can be severe, prompting admission to intensive care, liver transplantation and death. Despite reasonably prompt diagnosis and a multimodal treatment strategy, mortality from A. phalloides poisoning can be very high in parts of the world, approaching 40%. Further, although liver transplantation may be an option in severe hepatitis, rapid progression of poisoning and critical illness may cause patients to be too unwell to undergo the procedure. Therefore, research for improved methods for the treatment of A. phalloides poisoning, including new antidotes, is an active area of research.

In addition to supportive care, the multi-modal treatment that is commonly used is to decrease absorption (activated charcoal), increases elimination (multiple doses of activated charcoal), block hepatocellular uptake (penicillin, silibinin or silymarin), and reduce inflammation/necrosis (acetylcysteine). Other treatments advocated to enhance elimination include forced diuresis, biliary drainage, haemodialysis or haemoperfusion, but these are rarely applied. The administration of treatments for A. phalloides is time critical, but some treatments may not be readily available.

Based on limitations in the efficacy and/or availability of these treatments, there is ongoing research to develop novel treatments for A. phalloides, and also to optimise current treatment regimens.

Recent research with human hepatocyte cultures has highlighted potentially beneficial effects of medicines that are currently available for other purposes. These include rifampicin (blocks hepatocellular uptake), cyclosporine (blocks hepatocellular uptake) and polymyxin B (competitive antagonist at RNA polymerase II). Further research on the role and effect of these treatments is warranted, but given the severity of A. phalloides poisonings, it may also be reasonable to consider their use in human poisonings on a case-by-case basis. Although a therapeutically equivalent dose needs to be ascertained, pharmacokinetic simulation studies may be informative.

It may also be useful to explore geographical differences in mushroom toxin contents, including discovery of other hepatotoxins. This may guide research into the effect of existing and novel antidotes and treatments based on the region of origin, rather than history and/or clinical syndrome.
Oral Abstracts

7A-04

MUSHROOM POISONING IN THAILAND: A 3-YEAR RETROSPECTIVE REVIEW OF POISON CENTERS DATABASES

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4 Ramathibodi Poison Center, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Thailand, 5 Mahidol University International College, Mahidol University, Thailand

Objectives: To review mushroom poisoning cases consulted to Siriraj Poison Control Center and Ramathibodi Poison Center from 1st January 2013 to 31st December 2015.

Methods: This is a retrospective review of poison center databases of Siriraj Poison Control Center and Ramathibodi Poison Center from 1st January 2013 to 31st December 2015. Case identification was achieved by electronic searching with the key word “mushroom” as well as hand searching through paper based records. Data abstraction included date of consultation, patients’ characteristics, clinical manifestations, investigation, treatments, final outcomes and mushroom identification.

Results: There were 1251 mushroom poisoning cases from 553 incidents with the cluster size up to 13 patients reported during the study period. Of these, 207 and 1044 cases were from Siriraj Poison Control Center and Ramathibodi Poison Center respectively. The mean age was 40.8 years (minimum 1, maximum 94, SD 19.6). Most patients were Thai (87.1%), male (52.0%), picked mushrooms from the wild (92.6%), and ingested wild mushroom for food (98.1%). Cases reported from May to October accounted for 88 percent of total cases. The majority of cases were from provinces in the northeast region (57.9%) and the north region (39.7%) of Thailand. Onset of gastrointestinal (GI) symptoms was less than 6 hours in 963 cases (77.0%). Most patients (89.4%) had at least one GI symptoms including abdominal pain, nausea, vomiting or diarrhea. Major clinical diagnosis included GI irritants (66.3%), cholinergic (11.3%), amatoxin (6.3%), and hallucinogenic (2.9%) mushroom poisonings. Mushrooms were identified in 24 cases demonstrating Amanita spp., Rusolla spp., Inocybe spp., Clitocybe spp., and Macrolepiota spp. In addition to supportive care, treatments included nasogastric lavage (25.0%), single dose (36.8%) or multiple dose (10.1%) activated charcoal, high dose penicillin (5.0%), N-acetylcysteine (8.1%) and silibinin (2.1%) administrations. There were 33 deaths (2.6%) from amatoxin poisoning including a 2-year old girl who underwent liver transplantation on hospital day 8, died on hospital day 20 due to multi-organ failure. Three pregnant patients were diagnosed with GI irritant mushroom poisoning, had full recovery. There were no reported adverse effects to their fetuses. Mushroom poisoning was listed as a reportable disease on the surveillance system of the Bureau of Epidemiology, Thai Ministry of Public Health, however only 40 cases (3.2%) were reported.

Conclusion: This study describes the pattern of mushroom poisoning in Thailand. The incidence and fatality ratio of mushroom poisoning is observed to be high compared with developed nations. It is hence recommended that we need to improve case prevention and management guidelines, and enhance our research into mushroom poisoning, in Thailand.
Oral Abstracts

7A-05

SOCIAL DETERMINANTS OF HEALTH, KNOWLEDGE, PRACTICE AND AWARENESS OF THAI MUSHROOM PICKERS: FACE TO FACE INTERVIEWS IN 11 VILLAGES

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Objectives: To demonstrate the social determinants of health, knowledge regarding mushrooms, practice on mushroom picking and awareness concerning mushroom poisoning amongst Thai mushroom pickers.

Methods: Face to face interviews were performed in July 2016 using a structured questionnaire and impromptu note taking by 33 trained interviewers including two authors(TJ, SS). Participants included Thai mushroom pickers 18 years of age or older, who resided in one of three provinces with high incidence of mushroom poisoning.

Results: A total of 440 mushroom pickers from 11 villages were interviewed, of which 236 were from northeast region(AmnatChareon or UbonRajchathani Provinces), and 204 participants were from north region(Nan Province). The mean age was 49.6 years(minimum 18, maximum 85, SD 12.5). The mean duration of mushroom picking experience was 26.4 years(minimum 1, maximum 70, SD 15.7). The majority of participants were female(84.8%), completed elementary school(51.4%), did agricultural work(75.9%) and had low income(88.6%). Some 50 percent of participants indicated that selling wild mushrooms contributed significantly to their household income. Seeking medical attention was a significant burden for 40 participants, given the cost of transportation and missed opportunity to work. Some 378 participants(85.9%) were confident that they could correctly distinguish edible from poisonous mushrooms, however 40 participants responded incorrectly when presented with pictures of A.princeps and A.virosa during the interview. The incorrect identification of mushrooms from the provided pictures was not associated with their prior experiences of falling ill following mushroom ingestion(OR:0.87, 95%CI:0.26-2.98). Some 390 participants(88.6%) indicated that mushroom poisoning was an important public health problem in Thailand. Some 426 participants(96.8%) had heard about deaths from mushroom ingestions and public warnings, however 290 participants(66 %) indicated that the news and public warnings had no influence on their attitudes concerning picking mushroom, as they were confident in their abilities. Participants suggested the following strategies; mushroom pickers should pick only obvious edible mushrooms and avoid suspicious types; public healthpersonnels should provide posters showing edible and poisonous mushrooms. These should be made widely available and come with a public warning; the government should improve the quality of medical care, enhance the antidote stockpile, and support research into mushroom poisoning.

Conclusion: This study confirms that mushroom pickers have inferior social determinants of health, carry varying levels of incorrect knowledge and practices regarding mushrooms, but are aware of mushroom poisoning as an important public health problem. Prevention and intervention of mushroom poisoning should be performed at individual, community and national levels.
Oral Abstracts

7A-06

IV SILIBININ (LEGALON ® SIL) FOR THE TREATMENT OF AMATOXIN MUSHROOM POISONING (AMP) INDUCED LIVER INJURY AND FULMINANT HEPATIC FAILURE (FHF): AN OPEN LABEL PROSPECTIVE UNCONTROLLED CLINICAL TRIAL

ST Mitchell1, A Buchwald1, M D’Amato2, DA Spyker3

1Dominican Hospital; Santa Cruz, CA USA, 2Rottapharm Biotech, Monza, Italy, 3Oregon Health Sciences University

Objectives: IV SilibininLegalon® SIL (SIL), registered in Europe since 1980s for AMP hepatotoxicity based on dog studies and retrospective human data, never investigated prospectively. SIL treatment failures, resulting in deaths/liver transplants, recently reported in Turkey, Australia, Germany, France. SIL stimulates RNA Polymerase I, inhibits apoptosis, antioxidant. Diverts amatoxin into general circulation by inhibiting enterohepatic reuptake, occupying bile salt intended hepatocyte sinusoidal membrane transporters OATP1B3 and NTCP.

Methods: Prospective Uncontrolled Open Label USA Clinical Study; 80 enrollees since 2007. SIL provided free; delivery takes ~ 24 hours. Bolus 5 mg/kg over 1 hour; 20mg/kg/day continuous infusion of 2496 hours. Protocol includes rapid ED volume replacement, sustained aggressive IV hydration, multilumen central IV catheter, Foley catheter, npo status, Octreotide infusion (s ince2013 ). Requirements: 1) Daily telephone contact between PI, treating physicians; 2) Complete inpatient chart copy to PI following discharge.


Conclusions: Oliguric AKI precedes/precipitates full blown FHF in most poor outcome AMPs, not vice versa. Uncorrected lactate elevation sensitively portends impending oliguric AKI leading to severe FHF, transplant indication and poor prognosis. Sustained lactate correction likewise augurs recovery. SIL treatment failure inevitable after oliguric AKI; amatoxin diverted into general circulation cannot be cleared. AMP treatment success or failure largely determined by IV fluid management. Oliguric AKI easily prevented with rapid ED volume replacement and sustained aggressive IV hydration. SIL safe and well tolerated; effective initiation window ~ 108 hours. Combined with rapid ED volume replacement and sustained aggressive IV hydration, SIL reliably reverses severe AMP induced FHF with INR reduction by ~ 30th infusion hour unfailingly heralding recovery.
Oral Abstracts

7B-01

ROLE OF HIGH FIDELITY SIMULATION IN TOXICOLOGY TEACHING

Ong Yong-Kwang Gene

KK Women’s and Children’s Hospital

Abstract: Traditionally, toxicology education especially critical toxicology consists of didactic, structured or interactive teaching using lecture-based or case-based learning. While this is good for formal, written or verbal assessments, translation into clinical practice remains largely inferred. In critical toxicology, resuscitation is the main management. As such, high fidelity simulation training allows for multi-dimensional considerations in the assessment and management of the critically ill poisoned patient. The pedagogy of the role of simulation in toxicology education will be discussed. The lecture will also discuss about how simulation can value-add with enhanced realism (toxidrome recognition and odours) during simulation training and the limitations of using high technology equipment. The concept of toxicology simulation education and training in its myriad forms will be explored.

Learning Objectives:
1. Understand the role and potential roles of simulation training in toxicology
2. To understand the pedagogy of simulation training and specific relevance in toxicology education
3. Discussion on the forms of simulation training in toxicology education
Oral Abstracts

7B-02

THE GLOBAL EDUCATIONAL TOXICOLOGY UNITING PROJECT (GETUP): UPDATES

Anselm Wong¹,²

¹Victorian Poisons Information Centre and Austin Toxicology Service, Austin Health, Victoria, Australia, ²School of Clinical Sciences, Department of Medicine, Faculty of Medicine, Monash University, Victoria, Australia

As an outreach project of the ACMT International Committee, the Global Education Toxicology Uniting Project (GETUP) has attracted a highly dedicated group of toxicology educators. This talk will deliver updates about the latest GETUP projects, including video conferencing, YouTube and a formal online curriculum.

Learning Objectives
1. Learn about the use of video conferencing to aid toxicology case discussion with simultaneous participation from multiple sites.
2. Learn about the use of YouTube as a tool for recorded conferences.
3. Learn about the use of an online toxicology curriculum to teach distance-learning.
Oral Abstracts

7B-06

OUTSOURCING TOXICOLOGY EDUCATION—WHAT ARE THE OPTIONS?

RJ Hoffman

Sidra Medical and Research Center, Division of Emergency Medicine

Abstract: As a solo toxicologist tasked with running a clinical toxicology service and a toxicology fellowship at a busy medical center in the Middle East, Dr Hoffman looked externally and reached out to academic toxicology programs in the North America for help with capacity building in academic toxicology. In this presentation you can find out what happened next, and what can be learned from this experience. This discussion will include a description of and proposed solutions for the substantial global “toxicology educator gap” in the Middle East/North Africa and Asia-Pacific regions. Resources available to fill such an educator gap can be can be categorized in many ways, but the most relevant are: cost; contact with a qualified medical toxicologist; group or solo study, synchronous or asynchronous; and difficulty of training, particularly if it is most appropriate for a basic (medical student), basic (emergency medicine resident) or advanced (toxicology fellow) level.

Learning Objectives:
1. Describe toxicology educational resources relevant to medical toxicology training for medical toxicology or emergency medicine programs
2. Evaluate external resources for educational value and appropriateness for a group of trainees
3. Plan and integrate available external toxicology educational resources into an established residency or fellowship training program
Oral Abstracts

8A-01

ADULTERATION IN BOTANICAL PRODUCTS

Hwee-Ling Koh

Department of Pharmacy, Faculty of Science, National University of Singapore

Abstract: This talk will give an overview of the quality control of botanical products (dietary supplements, complementary health products) and factors affecting the quality. In particular, the presence of undeclared drugs and drug analogues pose a challenge to health regulators and healthcare professionals. Unknowing users are at risks. The issues and challenges concerning the adulteration of botanical products with phosphodiesterase Type 5 inhibitors and their analogues are discussed.

Objective:
1. To have an overview of the quality control of botanical products and factors affecting the quality
2. To understand what is adulteration
3. To understand the issues and challenges concerning adulteration of botanical products used for sexual performance enhancement, in particular, adulteration with undeclared drugs and drug analogues
Oral Abstracts

8A-02

HERBAL TREATMENT AND SUB-ACUTE ARSENIC POISONING - VIGILANCE, MANAGEMENT AND LESSON LEARNT

Raymond SM Wong, Jones CM Chan, Thomas YK Chan

Prince of Wales Hospital, The Chinese University of Hong Kong

Objectives:
1. Arsenic poisoning can occur in patients after prolonged exposure to herbal medicine containing high level of arsenic
2. Patients may present with clinical features of both acute and chronic arsenic poisoning
3. Clinicians should be vigilant and confirm the source of exposure

Methods: Realgar (As4S4) is used for treatment of skin disorders in Chinese medicine. We report here an outbreak of subacute arsenic poisoning following prolonged use of high dose realgar-containing anti-psoriasis pills.

Results: Thirty-one patients were exposed to realgar-containing folk medicine for a mean duration of 132.9 days (range: 7 – 1098 days). On average, each pill contains 9385 μg inorganic arsenic and 1.4 μg mercury. The estimated mean inorganic arsenic exposure was 259.8 μg/day (range: 90.6 – 494.5 μg/day). Acute toxicities were not uncommon. Eighteen (58%) experienced nausea and vomiting; thirteen (42%) had significant weight loss of 20 or more pounds; and 10 (32%) experienced transient facial edema. Features of chronic poisoning were found in 65% of patients. Twenty (65%) had melanosis / spotted hypopigmentation of skin; Nine (29%) had keratosis, mainly over the palmar and plantar regions; Eighteen (58%) complained of numbness and paresthesia of palms and soles. Six (19%) developed motor neuropathy, four of those with severe weakness affecting activities of daily living. One patient developed lower limbs edema, transudative ascites, and hepatosplenomegaly with CT scan showing features of Budd Chiari syndrome. Among 11 patients tested with nerve conduction study, sensorimotor neuropathy was supported in 5 (45%) patients. Haematological abnormalities were also common. Seventeen (55%) had macrocytosis (<98 fl); Six (19%) had mild leucopenia (<4.0 x10⁹ /L); two (6%) had anaemia. Seventy-three percent of patients had elevated arsenic levels adjusted with creatinine in spot urine samples (> 5 μgAs /g creatinine), measured by the inductively coupled plasma-mass spectrometry (ICP-MS). The mean As/Cr level in spot urine was 43.2 μg/g Cr (min. – max., 5.1 – 353.0 μg/g Cr). Sixty-nine percentage of patients had elevated arsenic levels in 24-hour urine samples (As > 50 μg/day).

Conclusion: This is a unique cohort of subacute arsenic poisoning as the patients had been exposed to inorganic arsenic of quantity much higher than those with drinking water in contaminated region, with substantial amount of urinary As for a prolonged period of time. It was believed that the toxicity of the folk medication was inadvertently increased by heating during manufacturing process, where As4S4 in the realgar was oxidized to arsenic trioxide (As2O3). Arsenic poisoning can occur following inappropriate preparation and use of realgar-containing folk medicine.
Oral Abstracts

8A-03

CARDIOACTIVE STEROIDS RELATED POISONING IN TAIWAN

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Background: Cardioactive steroids are steroid molecules with pharmacological and toxicological effects on cardiac tissue. Most cardioactive steroids from plants and pharmaceutical digoxin are cardenolides, whereas those derived from Bufo toads (bufotoxins) are bufadienolides. Non-pharmaceutical cardioactive steroids have been used as therapeutic agents, herbal tonic and aphrodisiac in some parts of the world. The effects of these toxicants can range from minor to severe toxicity or even death. However, reports of poisoning related to these agents remain limited and little is known about the predictors of severity following cardioactive steroid poisoning.

Methods: We conducted a retrospective analysis of all non-pharmaceutical cardioactive steroid exposures reported to the Taiwan National Poison Control Center between 1987 and 2014 to better understand the toxicity profile and factors associated with severe cardioactive steroid poisoning.

Results: A total of 71 patients were eligible for final analysis. Bufo toads or Chan Su were involved in 40 patients, whereas plants (e.g. Nerium, Thevetia and digitalis species) related poisoning were found in 31 patients. Mistaking cardioactive steroids for various therapeutic purposes was the most common reason of exposure. Eleven patients died after cardioactive steroid poisoning, including 10 patients who ingested parts of Bufo toads or Chan Su and one patient who ingested digitalis. Hyperkalemia (initial serum potassium level ≥5.1 mmol/L selected by using ROC curve; OR 12.9, 95% CI 2.3-7.28; p= 0.004) and the initial presentation of irregular heartbeat/ palpitation (OR 21.0, 95% CI 1.7-266.3, p= 0.02) were independent predictors of fatality in the final multivariate logistic regression model; whereas poisoning by Bufo toads or Chan Su poisoning was also associated with the risk of fatality, albeit of borderline statistical significance only (OR 14.6, 95% CI 0.7-291.4; p=0.08).

Conclusions: Non-pharmaceutical source of cardioactive steroid poisoning is uncommon in Taiwan. Clinical features of such poisonings are similar to pharmaceutical digoxin poisonings. However, poisoning by bufotoxins seems to be more frequently associated with fatal effects as compared to poisoning related to plant cardenolides. Hyperkalemia and the presence of irregular heartbeat/ palpitation also predict a poor outcome in such poisonings.

Learning Objectives:
1. To understand the pattern and outcome of cardioactive steroid related poisoning in Taiwan
2. To appreciate the potential differences in toxicity between cardenolides and bufadienolides
3. To understand the predictors of fatality of cardioactive steroid related poisoning

Methods: We conducted a retrospective analysis of all non-pharmaceutical cardioactive steroid exposures reported to the Taiwan National Poison Control Center between 1987 and 2014 to better understand the toxicity profile and factors associated with severe cardioactive steroid poisoning.

Results: A total of 71 patients were eligible for final analysis. Bufo toads or Chan Su were involved in 40 patients, whereas plants (e.g. Nerium, Thevetia and digitalis species) related poisoning were found in 31 patients. Mistaking cardioactive steroids for various therapeutic purposes was the most common reason of exposure. Eleven patients died after cardioactive steroid poisoning, including 10 patients who ingested parts of Bufo toads or Chan Su and one patient who ingested digitalis. Hyperkalemia
(initial serum potassium level ≥5.1 mmol/L selected by using ROC curve; OR 12.9, 95% CI 2.3-7.28; p= 0.004) and the initial presentation of irregular heartbeat/ palpitation (OR 21.0, 95% CI 1.7-266.3, p= 0.02) were independent predictors of fatality in the final multivariate logistic regression model; whereas poisoning by Bufo toads or Chan Su poisoning was also associated with the risk of fatality, albeit of borderline statistical significance only (OR 14.6, 95% CI 0.7-291.4; p=0.08).

**Conclusion:** Non-pharmaceutical source of cardioactive steroid poisoning is uncommon in Taiwan. Clinical features of such poisonings are similar to pharmaceutical digoxin poisonings. However, poisoning by bufotoxins seems to be more frequently associated with fatal effects as compared to poisoning related to plant cardenolides. Hyperkalemia and the presence of irregular heartbeat/ palpitation also predict a poor outcome in such poisonings.
VENOMOUS SPIDERS IN THAILAND: NEW DISCOVERY AND PARADIGM SHIFT IN NETWORK AND COLLABORATIONS

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Objectives: To demonstrate that a recent series of events in Thailand over the past two years confirms discovery of two new spider species in Thailand, and further ongoing networking and collaborations between medical toxicologists, entomologists and spider collectors.

Methods: Review medical records, microscopic examination of spiders, and review of on scene spider surveys from within the community.

Results: Spider bites were not considered a significant public health problem in Thailand until July 2014, when a 36 year-old male patient died from secondary infection following a spider bite. Intensive media coverage over two weeks reported that the cause of death was directly from the spider toxins. Initial suspicion focused on Loxoceles spiders, given skin infection and preliminary microscopic demonstration of a 3-paired-eyes spider sent in for evaluation. This focus occurred despite entomological studies by medical toxicologists, entomologists and amateur spider collectors confirming the nontoxic spitting spider, and despite a thorough survey of the area concluding that no deadly spiders were found.

The media coverage raised fear and confusion among the general public and healthcare professionals. A significant increase in the number of consultations and hospital visits due to spider bites was observed. Since this event, a consultation network among relevant experts has been established, which has resulted in the visual identification of spiders within 1 hour of photos being received, and microscopic confirmation of spiders within one day of delivery.

Since the establishment of this network, we have identified Latrodectus elegan from a specimen brought in by a 51-year old woman who was bitten on her left thigh in a cassava field. She developed pain, numbness, perspiration and piloerection at the bite site which radiated to her feet and hands. She had high blood pressure (164/93 mmHg), fever (39 C) and swollen eyelids that was recovered within a day. Entomological studies, and a thorough survey of the cassava field and community, confirmed the discovery of L.elegan in Thailand. Recently, Loxosceles rufescens (the Mediterranean recluse spider) was discovered exclusively from Wang Pra cave in Kanchana Buri province. However, there is no reported spider bite case attributable to this type. It was hypothesized that they were introduced into the area during the World War II by Japanese military.

Conclusion: We reported the historical events that lead to the discovery of Latrodectus elegan and Loxoceles rufescens, and the establishment of network and collaborations among experts in the field of spiders in Thailand.
Oral Abstracts

8B-02

A RANDOMIZED CONTROLLED TRIAL OF HOT WATER (45°C) IMMERSION VERSUS ICE PACKS FOR THE TREATMENT OF PAIN IN CHIRONEXFLECKERI STINGS

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Objective: Major box jellyfish (Chironex fleckeri) stings continue to be problematic in northern Australia. Although deaths are rare, severe pain remains a major issue. Hot water has been shown to be highly effective for the pain of Physalia spp. stings. We investigated the effect of hot water immersion on the pain of C. fleckeri stings.

Methods: We undertook an open-label randomised controlled trial at a tertiary hospital in northern Australia, in patients with C. fleckeri stings, comparing hot water immersion at 45°C to ice packs. Patients (>7yr) were recruited if they had a painful box jellyfish sting. Patients were allocated in a 1:1 randomisation. The primary outcome was a clinically significant reduction in pain severity 30min after enrolment using the visual analogue scale (VAS). Secondary outcomes included cross-over to the alternate treatment, use of opioid analgesia, emergency department length of stay (LOS), proportion with recurrent pain within 24h and proportion developing papular urticarial rashes subsequent to discharge. Analysis was intention to treat.

Results: There were 46 patients recruited to the study but pain scores and treatment allocation were not recorded in four patients. Of 41 patients (median age 19y; interquartile range[IQR]; 13-27y; 26 males), 25 were allocated to ice packs and 17 to hot water immersion. Both groups had similar demographics, baseline VAS and systemic effects. Thirty minutes after treatment commenced 14/25 (56%) of patients treated with ice packs had clinically improved pain compared to 11/17 (65%) treated with hot water immersion [absolute difference: 9%; 95%CI: -22 to 39%; p=0.75). One patient in the ice pack arm was crossed over to hot water immersion. Two patients in each arm were given intravenous opioid analgesia. The medial emergency department LOS for patients treated with ice packs was 1.6h (IQR: 1 to 1.8h) compared to 2.1h (IQR: 1.6 to 2.8h; p=0.07). No patients represented with recurrent pain. Only seven patients were able to be followed up, and 5 of these developed delayed hypersensitivity rashes.

Conclusion: Hot water immersion was no better than ice packs in the treatment of acute pain in Chironex fleckeri envenoming. The use of hot water immersion increased the length of stay by about 30min.
Oral Abstracts

8B-03

HISTAMINE POISONING DUE TO INSECT INGESTION: AN OUTBREAK INVESTIGATION FROM THAILAND

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Objectives: Insect is a common delicacy in the in the Asian culture. Adverse effects may be associated with insect ingestion. We are reporting an outbreak of histamine poisoning from ingestion of fried insects.

Methods: On July 25, 2014, a group of high school students at a seminar presented to Angtong Provincial Hospital, Thailand for symptoms of “food poisoning with pruritic skin rashes” after ingesting snacks consisting of fried insects from a local vendor. We initiated an outbreak investigation and collected samples of remaining foods for analyses. A retrospective cohort study was performed. The information collected were demographic data, types of food ingested by each individual, their clinical findings, and treatments received. Attack rates and relative risks were calculated.

Results: Out of 242 students, 28 developed acute illnesses. Mean age the sick students was (range 11-17). Fifteen (53.6%) of them were female. Clinical manifestations included, flushing, pruritus, urticarial rashes, headache, nausea, vomiting, diarrhea, dyspnea and bronchospasm. Two children were hospitalized overnight without serious complications. The type of food ingested included a lunch that was provided at the seminar for all students and snacks that 41 students bought from the only vendor in the vicinity. The snacks included fried grasshoppers, silkworm pupae, common green frogs, bamboo borers, crickets and meat balls. The attack rates were highest (82.6% and 85.0%) among students who ingested fried grass hoppers and fried silkworm pupae; and lowest (4.4 and 5.3%) among those who did not ingest them, with relative risk of 18.73 (95%CI 9.62-36.44) for grasshoppers and 16.0 (95%CI 8.75-29.26) for silkworm pupae. The average concentrations of histamine in the fried grass hoppers and silkworm pupae were 9.73 and 7.66 mg/100g, respectively. These concentrations were comparable with those of fish found to cause scombroid poisoning (Epidemiology and infection. 1987;99(3):775-82). Assays for insecticides were negative.

Conclusion: Through epidemiological outbreak analysis and laboratory confirmation, we have illustrated that histamine poisoning can occur from ingestion of certain fried insects. We postulate that histidine, which is known to be present in high concentration in grass hoppers and silkworm pupae is decarboxylated by bacteria to the primary intoxicant histamine, a heat stable toxin. The ingestion of such substance can give the clinical pictures of scombroid poisoning.
CHANGING OLEANDER (*THEVETIAPERUVIANA*) POISONING PATTERNS IN SRI LANKA AND NOVEL RISK FACTORS

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Objectives: Suicide via poisoning in low-income countries is common, and Sri Lanka had a very high rate of 47 suicides per 100,000 in 1995. Changing epidemiology of modes of self-harm appear to be occurring with a reduction in pesticide poisoning and increase in medicinal overdose. This study examines the epidemiology of oleander poisonings in this context, recorded at presentation to ten Sri Lankan hospitals.

Methods: Data was collected as part of an ongoing toxicology prospective cohort of all toxin self-poisonings recruited at ten hospitals across Sri Lanka. A range of demographic, treatment and outcome data was collected allowing trends from 2002-15 to be assessed over time in different parts of the country. Cases examined here were those involving a single poison (±alcohol). Case-fatality was calculated, and cases from different regions of the country were compared and contrasted.

Results: Case-fatality for presenting oleander cases was 2.6% (95% CI: 2.2, 2.9). Case-fatality in the first 12 months of the study (5.8%, 95% CI: 4.4, 7.4) was significantly higher than the last 12 months case-fatality (1.0%, 95% CI: 0.4, 2.3) and regressing case-fatality against time saw a decrease in case-fatality over time since the commencement of data collection in 2002 (p<0.001). Over the time period 15.0% of all poisoning cases were oleander poisonings (of total of 72,601 cases), with patients’ average age 24.6 years (±SD 10.4) and 50.7% were male. In the 10-20 year age group, only 40.9% were male (compared with 59% male in the 20-60 year group). Co-ingestion of alcohol may increase the risk of fatality after adjusting for age (OR 1.5 [95% CI: 0.99, 2.4]). The proportion of oleander cases receiving charcoal was reduced from 65% to 40% 2002-2016 at Anuradhapura and Kurunegala (p<0.05), but not Polonnaruwa. Use of atropine in treatment decreased over the study period but did so at different rates in different hospitals. Certain areas had proportionally higher numbers of cases, and higher case-fatality. Hospitals in dry and intermediate climatic zones reported a higher proportion of oleander cases than those in wet climatic zone. The higher case-fatality found during dry seasons could be due to increased toxicity of oleander, or increased dose, with the availability of seeds.

Conclusion: Improved care of patients presenting at Sri Lankan hospitals has seen a decrease in case-fatality. Young women are the group with highest rate of oleander poisoning, compared to other modes of self-harm. Yellow oleander toxicity may vary by region and season.
Oral Abstracts

9A-01

BEDSIDE TOXICOLOGY: WHAT NOT TO DO

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Abstract: The acutely poisoned patient poses a difficult challenge for the bedside clinician. Apparently well patients may deteriorate suddenly and we are often presented with incomplete information. We have potentially invasive specific and supportive therapies at our disposal, ranging from intubation to antidotes. In the context of a structured approach, this talk targets many of the ‘sins of commission and omission’ through which we can harm our acutely poisoned patients at the bedside: “First, do no harm”.

Learning Objectives:
1. Describe a structured approach to the acutely poisoned patient.
2. Identify common practices in the management of acutely poisoned patients that can cause harm.
3. Discuss persisting controversies and “myths” regarding the management of acutely poisoned patients.
EXTRACORPOREAL LIFE SUPPORT IN TOXICOLOGY - WHAT IS THE EVIDENCE AND WHEN SHOULD IT BE USED

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Objectives: Drug-induced cardiovascular failure remains a leading cause of death. Calcium-channel blockers (CCB) and beta-blockers (BB) account for about 40% of cardiovascular drug exposures, while CCB and glycosides represent the first causes of cardiotoxicant-related death.

Methods: This presentation will review the predictive factors for failure of the pharmacological treatments of drug-induced cardiovascular failure and define the place of extracorporeal life support (ECMO) in poisonings.

Results: Severe cardiotoxicity usually appears rapidly after the exposure with the sudden onset of hypotension, high-degree atrio-ventricular block, asystole, pulseless ventricular arrhythmia. Other critical features include mental status deterioration, seizures, hyperlactacidemia, and renal, liver and respiratory failure. Determination of the mechanism of cardiovascular failure is mandatory. Overdoses with CCB, BB, and membrane-stabilizing agents (MSA) result in myocardial negative inotropic effects and arterial dilatation. Prognostic factors remain poorly investigated and seem to be specific for a class of toxicants. Despite optimal supportive and antidotal treatments, management of drug-induced cardiovascular failure is difficult. Ventricular arrhythmia, sudden cardiac arrest, and refractory cardiovascular failure may cause death, despite tight monitoring and aggressive resuscitative measures and vasopressors. Prognosticators of refractoriness to conventional treatments are lacking. Due to large volumes of distribution and high protein binding ratios, extracorporeal elimination enhancement techniques are not feasible options. Lipid emulsion has been extensively used but due to the lack of randomized controlled studies, this treatment should be used only in local anesthetic systemic toxicity and lipophilic cardiotoxin intoxication with an immediate threat to life and ineffectiveness of other therapies. ECMO for reversible cardiac toxicity has a sound basis but clinical experience is also still limited in toxicology with insufficient evidence to conclude for its recommendation (grade C). The purpose of ECMO is to take over the heart function during refractory cardiac shock until recovery can occur, thus minimizing myocardial work, improving organ perfusion, and maintaining the renal and biliary elimination of the toxicant. By contrast, ventricular pacing can only be considered if the inotropic heart function is preserved. Interest of intra-aortic balloon pumps is limited due to the need for intrinsic cardiac rhythm for synchronization and diastolic augmentation.

Conclusions: Supportive and antidotal treatments are usually efficient to treat drug-induced hypotension. However, due to persistent high-rate of mortality, there is a need for more aggressive management in patients not responding to conventional treatments. Clarification of prognosticators of refractoriness is mandatory. Usefulness of ECMO remains a matter of debate and recommendations from the scientific societies are expected.

Learning Objectives:
1. To understand the role of ECMO in supporting drug-induced cardiac failure
2. To be aware of the optimal antidotes for the usual cardiotoxicant-induced poisonings
3. To understand how to assess refractoriness of drug-induced cardiovascular failure to the conventional pharmacological treatments
4. To understand the principles of management of the poisoned patient treated by ECMO 3. Plan and integrate available external toxicology educational resources into an established residency or fellowship training program
Conclusion: Improved care of patients presenting at Sri Lankan hospitals has seen a decrease in case-fatality. Young women are the group with highest rate of oleander poisoning, compared to other modes of self-harm. Yellow oleander toxicity may vary by region and season.
Oral Abstracts

9A-03

DIALYSIS IN THE POISONED PATIENT – WHAT, WHEN, WHO AND HOW?

Sophie Gosselin

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Abstract: Extracorporeal removal techniques exist for over a century and were first used in poisoning. Despite widespread use in a variety of poisonings, few high GRADE studies were published. Poisons amenable to extracorporeal removal must possess specific properties to be able to be filtered to the membrane. As well, the clearance obtained from a specific ECTR technique must be superior to the body’s endogenous clearance. The most common form of ECTR use in poisoning is intermittent hemodialysis (IHD). Continuous renal replacement therapies (CRRT) can be used in specific circumstances, but, in general the clearance obtained is lower than with IHD. The decision to initiate ECTR need to take into account the amount of poison, the delay since ingestion, the patient’s endogenous clearance, the cost and availability of alternative treatments and the risk of complications. Most complications reported with acute ECTR occur at the time of catheter insertion. Catheter infection and clinical bacteremia appear to be minimal for short term procedures. For many years, published indications came from expert opinion derived from small case series. More recently the EXTRIP workgroup an multidisciplinary international collaboration published systematic reviews and consensus expert recommendations for the use of extracorporeal poison elimination for various toxins.

Learning Objectives:
1. Identify two properties of poisons amenable to extracorporeal removal
2. Compare advantages and disadvantages between continuous renal replacement therapies and intermittent hemodialysis
3. Analyze two main risks of acute dialysis procedures
4. Discuss the proposed criteria for dialysis of common substances
OBJECTIVES: The study describes the patterns of accidental and deliberate poisoning, first aid measures, reasons for delayed management, complications and outcome following acute poisoning among children (9 months-12 years) in rural Sri Lanka. It also describes patient, poison and environment related independent risk factors in the same age group.

METHODS: The current multi-center study was hospital based and involved the two major hospitals (Anuradhapura and Polonnaruwa), and 34 peripheral hospitals of the North Central province of Sri Lanka (NCP). Total period covered by the study was seven years (2007-2014). Data were collected using interviewer administered questionnaires and a qualitative study (n=383). Age and gender matched case controlled study (n=600) assessed independent risk factors by multiple logistic regression method.

RESULTS: Among 1621 children, boys (956, 59%) outnumbered girls and most were in preschool age group. Majority belonged to the farming community. Commonest poison and type of poison were kerosene oil (307, 18.9%) and household poisons (489, 30.2%) respectively. Most had unintentional poisoning and incidents mostly occurred within their own house premises (304, 79.4%). Potentially harmful first aid measures were practiced on 113 children (29.5%). Deliberate poisoning rate was 4.95% (n=19) and were mostly associated with disrupted family dynamics and emotional vulnerability. Among 23 proposed risk factors, three risk factors were significant with p < 0.001 (CI= 99%) - inadequate supervision of the child, mother being employed during daytime and lack family support to look after the child. Unsafe storage, unsafe environment, incorrect parenting and delayed development in child were among other significant risk factors. Common reasons for delayed management were following delayed presentation due to lack of concern and knowledge regarding urgency (65, 16.9%) and complications (64, 16.7%). Complications were observed in 12.5% related to poison and first aid measures and commonest were chemical pneumonitis and acute liver injury. Psychological support was offered to 16% of deliberate poisoning victims.

CONCLUSION: Victims of acute poisoning in paediatric age group are predominantly preschoolers, and male children are at a higher risk. Complications though rare are potentially preventable through community education regarding risk factors, timely medical care and avoidance of harmful first aid practices. Since majority of accidental poisoning occurred in home environment, safe storage and assurance of safe environment as measures of prevention need further evaluation. Incorrect parenting and delayed development as risk factors need further studies as they were previously unreported. Psychological support to victims of deliberate poisoning should be improved in the studied population.
SEASONAL VARIATION IN SELF-POISONING IN TEN SRI LANKA HOSPITALS

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Objectives: Biorhythmic patterns in timing of deliberate self-harm is a phenomenon widely reported in epidemiological research, with many studies finding that peak rates occur in late spring around the world. Sri Lanka has one of the highest rates of self-poisoning in the world, with 11 self-poisonings per 100,000 in 2010-2012 accounting for 50% of suicides in Sri Lanka in that time frame. Located near the equator, Sri Lanka lacks the pronounced environmental variations with seasons in higher-latitude countries, so we investigated whether similar seasonal patterns of deliberate self-poisoning occur in Sri Lanka.

Methods: We used the cosinor method to explore seasonal patterns of suicides via plants, medicines, and pesticides and other toxins among more than 70,000 self-poisoning admissions to 10 hospitals across Sri Lanka between 2002 and 2015. The cosinor method uses trigonometric terms to model periodic data with a sinusoidal pattern and provides estimates of amplitude (distance from the median to the peak or trough), acrophase (peak time), and mesor (the median value about which the sinusoidal oscillation varies). Generalized linear models were used to determine the sinusoidal curves that best fit the self-poisoning rates for different types of poisons over time. F-statistics were calculated to compare cosinor model estimates of amplitude and acrophase among three classes of poisons.

Results: Different seasonal patterns were found in self-poisonings using oleander, medicines, and pesticides. The timing and maximum rate varied by poison category. Use of pesticides in self-harm appeared to peak in April while oleander and medicine poisoning rates peaked in July, with acrophase estimates for pesticides significantly different than those for oleander and medicines (0.99, -0.40, and -0.47 radians, respectively; p-value<0.001). The peak rate of self-poisonings by oleander was significantly increased over those for medicines and pesticides (amplitudes of 0.13, 0.06 and 0.04, respectively; p<0.001).

Conclusion: Awareness of the seasonal nature of self-poisoning may allow preventive strategies to be designed and public health resources to be prepared in advance of the yearly peaks.
ADMINISTRATION OF OVER-THE-COUNTER MEDICATION TO CHILDREN AT HOME AND ACCURACY OF ORAL LIQUID MEASURING DEVICES- AN OBSERVATIONAL STUDY

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Objectives: To identify accuracy of measuring over the counter medication for children and to assess accuracy of oral liquid measuring devices

Method: The study population was mothers of children age 1 to 5 years of age. Participants were selected by using stratified random sampling method from 2 rural areas. Mothers were asked about preferable dosage form of paracetamol for the child. Then mothers were asked to demonstrate measuring of paracetamol for their child if the child has fever. Mothers were allowed to use any measuring devices they normally use for measuring liquid paracetamol.

Mothers were then provided with 3 different dosing instruments including measuring cup, calibrated spoon and dropper and asked to measure 5ml Paracetamol liquid formulation.

Results: Measuring cup (71%, n=94) associated with the paracetamol package was the most common measuring device, followed by syringe (n=7), calibrated spoon (n=1) and household spoons (n=3). Only 45 mothers (34%) measured accepted dose. Majority 44% (n=59) of measurements were under dose while 15% mothers made excessive dose. 5 mothers (4%) made supratherapeutic dose and 4 mothers (3%) made subtherapeutic dose. There is a significant difference between correct dose according to the child weight and the measured tablet (p=0.0080) and paracetamol syrup (p<0.0001) dose measured by mothers. 56% of mothers were made excessive dose when measuring tablet for the child while 51% of mothers who used cup for measuring syrups made under dose. All the mothers who used household spoons made under dose and sub therapeutic dose. The highest (43%) accurate dose measurements were done by using syringes.

Table 1. Dosing Errors by instruments
Oral Abstracts

<table>
<thead>
<tr>
<th>Instrument Type</th>
<th>Mean ml (SD)</th>
<th>Dosing Error Category, No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No error</td>
<td>Small error</td>
</tr>
<tr>
<td>Dosing cup</td>
<td>4.868 (0.6714)</td>
<td>80 (60)</td>
</tr>
<tr>
<td>Calibrated spoon</td>
<td>4.147 (0.5532)</td>
<td>39 (29)</td>
</tr>
<tr>
<td>Syringe</td>
<td>4.856 (0.4652)</td>
<td>115 (86)</td>
</tr>
</tbody>
</table>

No error indicates within 10% of the recommended dose; small error, greater than 10% to 49% deviation from the recommended dose; and large error, greater than 49% deviation from the recommended dose.

Measuring cups were the most accurate device followed by syringe (p = 0.3797). The highest dosing error was made by calibrated spoons and the error was significantly higher than measurements made by dosing cup and syringe. (Measuring cup vs Calibrated spoon < 0.0001 while Syringe vs Calibrated spoon < 0.0001).

**Conclusion:** Dosing cup was the most common measuring device used by mothers to measuring liquid medications. Mothers measured syrup accurately than tablet dosage form. Subjects were more likely to measure an acceptable dose with an oral syringe when compared with a dosing cup. A large proportion of study participants were unable to measure an accurate dose with calibrated spoon. Some mothers measured supratherapeutic paracetamol doses and this may lead to paracetamol toxicity if they consistently administered supratherapeutic doses for their child. Educational intervention should be implemented to address the importance of accuracy of dose measurements and selection of appropriate dosage form and dosing devices.
Oral Abstracts

9B-04

PATTERN AND OUTCOME OF PATIENTS ADMITTED WITH DELIBERATE SELF HARM IN MEDICAL WARDS OVER 5 YEARS – A RETROSPECTIVE STUDY

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Objectives and Methods: A retrospective analysis of case records of patients admitted with DSH in medical wards during 5 years from January 2010 to January 2015 was done to find out the various agents used for DSH, to find out the case fatality rate (CFR) of each agent and to identify the more harmful agents.

Results: During 2010 to 2015, 3906 patients were admitted with self-poisoning (805, 710, 868, 784, 741 in each year). There were 2215 males and 1691 females. Mean age of study population was 35±15.7. There were 1518 (38.8%) cases of insecticide exposure, 753 (19.3%) plant poisonings, 603 (15.4%) drug over dosage, 487 (12.5%) rodenticide exposure, 181 (4.6%) petroleum product exposure, 58 (1.5%) corrosive ingestion, 190 (4.9%) cases of exposure to miscellaneous agents, 103 (2.6%) cases of exposure to unidentified agents and 15 cases of exposure to multiple agents. Among the study population, 397 (10.2%) patients expired, with a case fatality rate (CFR) of 13.8%, 11.4%, 8.1%, 9.3%, and 8.6% in each year from 2010 to 2014 respectively. CFR of corrosives was 22.4%, insecticides 18.7%, rodenticides 6.8%, plant poisons 4.8%, drugs 1.8%, unidentified agents 9.7%, miscellaneous agents 4.3%, multiple agents 6.7% and petroleum products 0%. During 2010 to 2014 corrosives constituted 1.9%, 1%, 1.8%, 1.4%, 1.2% of cases in each year respectively; insecticides constituted 46.1%, 41%, 36.9%, 37.2%, 33%; rodenticides constituted 11.7%, 13.2%, 13%, 12.5%, 11.9%; plant poisons constituted 15.8%, 17.7%, 20.4%, 20.7%, 21.8%; drugs constituted 12.5%, 13.8%, 15.2%, 15.6%, 20.3%; petroleum products constituted 5%, 4.6%, 3.8%, 5.1%, 4.7%.

Conclusion: Mortality by DSH is coming down over the past years. Use of insecticides with relatively high CFR declined whereas use of drugs and plant poisons with lesser CFR was rising. This may be due to recent restriction on the sale of pesticides resulting in lower mortality in patients admitted with DSH.
CHANGES IN THE POPULATION INCIDENCE OF DELIBERATE SELF POISONING IN NORTH WESTERN PROVINCE OF SRI LANKA – SIGNS FOR A DECLINE

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Objectives: Deliberate self poisoning has been a major public health issue in rural parts of Sri Lanka. We noted recent speculation among hospital staff that the number of deliberate self poisoning cases was declining. A large proportion of self poisoning patients are treated in hospitals and evidence of declining admissions could be a signal of decreasing self poisoning rates in these rural districts. In this study, data collected from all hospitals in Kurunegala district in North Central Province over period of four years were analysed to assess the changes in the population incidence of deliberate self poisoning.

Methods: Data were collected from 43 peripheral hospitals from 2011 to 2014 as part of hospital based cluster RCT on promoting treatment guidelines using different educational approaches. Patients who were transferred from other hospitals outside the district were excluded using their addresses and village names. Population data of Kurunegala district together with the subgroups of age and gender were used to calculate the annual population incidences for different age groups and genders.

Results: In 2011, the population incidence of deliberate self poisoning was 235/100,000 for the total population. This rate declined to 231/100,000 in 2012, 178/100,000 in 2013 and 162/100,000 in 2014. This decline was similar in both genders. The 15 to 19 age group recorded the highest population incidence (627/100,000) in 2011 and decreased to only 385/100,000 in 2014. Females aged 15 to 19 years had the highest population incidence (823/100,000) in 2011. This declined to 523/100,000 in 2014, although this sub-group continued to have the highest risk. The proportion of self poisonings aged between 15 to 35 was similar in 2011 (75%) and 2014 (71%).

Conclusion: The population incidence of self poisoning in Kurunegala district of North Western Province of Sri Lanka decreased remarkably from 2011 to 2014. The decline occurred fairly uniformly across all age groups. Young people remain the group at highest risk of self poisoning. It is important to conduct similar investigations in other rural districts in Sri Lanka to identify if this is a nationwide change in deliberate self-harm. It is also essential to assess whether the total number of suicides has also declined over this time or whether this reflects a change in methods of deliberate self-harm being used. However, a real decline seems the most likely explanation and may reflect increasing prosperity and optimism following the end of the decades of civil war.
NURSES’ ATTITUDES TOWARDS SUICIDE AND DELIBERATE SELF-HARM IN RURAL SRI LANKA: A STUDY FORM RURAL PART OF NORTH WESTERN PROVINCE

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³Faculty of Applied Sciences, Rajarata University of Sri Lanka
⁴Department of Public Health
University of Copenhagen, Denmark
⁵Sydney Medical School, University of Sydney, Australia

Objectives: The aim of the present study was to explore the attitudes and experiences of nurses’ in rural primary care hospitals towards Suicide and Deliberate self-harm (SDSH)

Methods: This was a hospital based ethnographic study; conducted in the North Western Province of Sri Lanka. Four focus group discussions, Thirty three semi-structured in-depth interviews with nurses and observations was conducted in rural primary care hospitals, selected using purposive sampling method. Interviews were audio recorded and transcribed for thematic analysis.

Results: Overall nurses showed relatively positive and favorable attitudes towards SDSH patients as well as they didn’t discriminate them from other patients. They reported positive feelings such as sympathy, compassion, supporting, understanding, sadness, and worrying. Few nurse had unfavorable attitudes towards SDSH considering them weak in personality, mentally ill, or attention seeking. Also those who had negative feelings saw the ‘wrongful behavior’ as a results of rural people’s low educational level, making people ‘uneducated’ on how to make good life decisions and solving problems without refraining to SDSH. As the nurses lived in the local rural community, they felt they had insight into SDSH in rural Sri Lanka. They perceived as a reaction to local major socio-economic problems including: unemployment, unstable incomes and poverty. The following risk factors for SDSH were identified: 1. Agricultural challenges and failures for males. 2. Domestic violence, abuse and female migration for women. 3. Dependency, isolation and feeling worthless for elders. 4. Child abuse was considered as a serious social problem, disturbed interpersonal relationships, unreturned love for youth.

Conclusion: Nurses frequently encounter SDSH patients in rural hospitals and therefore must be aware of their attitudes towards this group of patients as a part of their professional and therapeutic role. The perceived need for formal training of mental health counseling for the patients was strongly identified among these rural nurses. Nurses need to be better prepared with regard to mental health counseling and should be enhanced by providing further specific trainings. These trainings should be included with developing skills and favorable attitudinal changes towards SDSH patients.
Oral Abstracts

10A-01

REVIEWING A CHEMICAL WARFARE ATTACK TRAGEDY: LESSONS LEARNT

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Objectives: To review a chemical warfare attack to civilians, and chemical emergency response including awareness, preparedness and management in poor resource area.

Methods: Halabja a Kurdish town in Iraq is reviewed in a chemical attack. The weaknesses of preparedness and management are presented through a photo series of incidents have taken place.

Results: Chemical agents are classified according to how they affect and traditionally including nerve, blood, choking, blister and incapacitating agents.

Although chemical weapons usually are designed more to injury than to kill but they can cause a mass casualty that may spread through secondary contamination particularly if it has potential to affect large populations.

There might be visible evidence of a release, such as explosion or notification of less evident environmental changes such as dirty surface water, specific odors, colorful steam or clouds, death or injury of wildlife or irritation of the eyes, nose or effects on other organs.

Conclusion: Probably most of us are not ready for a terrorist chemical attack. Early spot decontamination within minutes can save lives and greatly reduce injury. Later decontamination at the decontamination facilities serves to further protect the patient, health care workers, and medical treatment area. Timely physical removal of chemical warfare or hazardous materials is always the first priority. For large scale incidents, water or soap and water, if readily available, are as good as anything for decontamination.

Once a chemical attack is detected, trained authorities may able to respond appropriately, evaluate risks to public health, and implement other appropriate actions based on established guidelines and procedures.

<table>
<thead>
<tr>
<th>Learning Objective 1</th>
<th>Gain a perspective of the chemical warfare agents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning Objective 2</td>
<td>Be familiar with typical chemical warfare attacks in the field</td>
</tr>
<tr>
<td>Learning Objective 3</td>
<td>Become aware of the most common presentations of these toxicities</td>
</tr>
<tr>
<td>Learning Objective 4</td>
<td>Be able to imagine how to manage such patients and protect yourself</td>
</tr>
</tbody>
</table>
Inhalation exposure to nerve agents results in respiratory failure with death ensuing within minutes in the absence of antidote administration. On the other hand, percutaneous exposure to persistent nerve agents such as VX produces largely asymptomatic casualties for several hours before casualties succumbed to its effects. The uncertainty in type of nerve agent exposure poses a challenge in mass casualties triage as observed in the 1995 Tokyo Sarin attack. The large influx of casualties within initial hours of the incident compounded the challenge on clinical triage. The current diagnostic assay to support clinical triage relies on monitoring for substantial depreciation in blood acetylcholinesterase levels. This approach requires individual’s pre-exposure value for meaningful interpretation of results, which limits its application for differentiating casualties without clear signs of intoxication. To circumvent this challenge, DSO developed a novel field triage kit that detects for nerve agents regenerated in-situ from inhibited blood. This presentation describes the ability of this field-deployable kit for screening masses of asymptomatic casualties with suspected exposure to various types of nerve agents. The presentation will also provide a brief comparison on the relative roles of anticholinergic and oximes reactivators during the acute phase of resuscitating severely intoxicated casualties.
Oral Abstracts

10A-03

METHANOL POISONING DIAGNOSIS MADE EASY – THE FORMATE BEDSIDE STRIPS: NEW DATA OF A NOVEL METHOD

Knut Erik Hovda

The Norwegian CBRNe Centre of Medicine, Department of Acute Medicine, Oslo University Hospital, Ullevaal, Norway

Background
Recent years, the global problem of methanol poisonings has gained increased attention, both in the medical literature, but also in the news. The diagnostic alternatives are not satisfactory overall, and more or less non-existing in the low- and middle income countries. We have therefore developed a bedside diagnostic for measuring formate, the toxic metabolite of methanol. The present prototype represents the second generation strip where the problem with short shelf-life on the original model has been solved.

Methods
The strips are constructed in such a manner that the red blood cells will be filtered from the reactants, making it possible to use full blood (one drop/40µL) without spinning before sampling. The current test of the prototype had two major purposes: To test the sensitivity on different levels of formate, the specificity towards other relevant substances, and a blinded test on four health-care professionals. The specificity-testing was performed with: D-L-lactate, beta-hydroxy-butyrate, glycolate, pyrogluatmate, ascorbic acid, ethanol, methanol, ethylene glycol, isopropanol, glycerol, di-ethylene glycol, acetone, semicarbacide, glycolic acid, oxalic acid, methylene blue, fomepizole, and EDTA. Further, we evaluated the potential inhibition of the enzymatic reaction from fomepizole, isoniazid, Na-nitroprusside, methylene blue, ascorbic acid, Na-salicylate, nicotine, cotinine, K-thiocyanate, oxalic acid, carbamide, creatinine, and uric acid. The blinded samples were performed on one ICU nurse and three intensivists, each were given 12 spiked samples of full blood containing various amounts of formate. One of the tested persons were colorblind.

Results
The sensitivity of the strips was excellent, with an increasing color reaction with higher concentrations of formate. There was no influence on the specificity testing on any of the tested substances (i.e. no false positives). Uric acid and ascorbic acid, in high concentrations inhibited the color development, leading to slower development of color and underestimation of the formate concentration at low and at high concentrations of formate. Thiocyanate and nitroprusside gave slight inhibition, whereas the others gave no detectable inhibition. The blinded tests indicated that observers could easily distinguish between strongly positives and negative samples, but we observed notable inaccuracies in quantification between 2mmol/L and 5mmol/L.

Discussion
The results from the testing on the prototype were promising: No false positives from other substances capable of causing acidosis. There was decreased performance of quantification in the presence of inhibitors, exogenous and endogenous in high or pathological concentrations, but the strips could still give clear indications of formate if present. The blind-test with the clinicians was encouraging, but with inaccuracies.

Conclusion
We are encouraged by the results. We believe the inaccuracies reflect the imperfection of the pilot production processes and will be remedied by industrial-scale production. We expect the formate test will be ready for final production, testing and regulatory approval within the nearest future, with market release in 2017.
Conflict of interest
The presenter declares no conflict of interest. The production and sales will be non-for-profit for the inventors: All future income from the product is donated to a charitable fund meant to support the availability of the diagnostic tool to the developing world.

Learning Objectives:
1. After the session the participants should be able to explain the use of the formate bedside strips for diagnosing methanol poisoning
2. After the session the participants should be able to explain the pros and cons with the present strips
3. After the session the participants should be able to describe the most important pitfalls to such a diagnostic tool

Methods: The strips are constructed in such a manner that the red blood cells will be filtered from the reactants, making it possible to use full blood (one drop/40µL) without spinning before sampling. The current test of the prototype had two major purposes: To test the sensitivity on different levels of formate, the specificity towards other relevant substances, and a blinded test on four health-care professionals.

The specificity-testing was performed with: D-L-lactate, betahydoxy-butyrate, glycolate, pyroglutamate, ascorbic acid, ethanol, methanol, ethylene glycol, isopropanol, glycerol, di-ethylene glycol, acetone, semicarbacide, glycolic acid, oxalic acid, methylene blue, fomepizole, and EDTA. Further, we evaluated the potential inhibition of the enzymatic reaction from fomepizole, isoniazid, Na-nitroprusside, methylene blue, ascorbic acid, Na-salicylate, nicotine, cotinine, K-thiocyanate, oxalic acid, carbamide, creatinine, and uric acid. The blinded samples were performed on one ICU nurse and three intensivists, each were given 12 spiked samples of full blood containing various amounts of formate. One of the tested persons were colorblind.

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Conclusion: We are encouraged by the results. We believe the inaccuracies reflect the imperfection of the pilot production processes and will be remedied by industrial-scale production. We expect the formate test will be ready for final production, testing and regulatory approval within the nearest future, with market release in 2017.
AN INNOVATIVE APPROACH TO HANDLE OUTBREAKS OF METHANOL POISONING

Morten Rostrup1,2, Kyrre Lind2, Dag Jacobsen1, Knut Erik Hovda3

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Medecins Sans Frontieres (MSF), which is an independent medical humanitarian organization, has for more than four decades worked in areas of conflicts and natural disasters taking a special interest in improving healthcare in areas with very limited resources. MSF has special experience in dealing with various kinds of outbreaks and mass casualties. In its work, MSF wants to challenge the double standard often faced in providing medical care in poor settings and abandon a concept of “poor man’s medicine”. To make this possible, MSF has initiated a lot of innovative projects both addressing improved diagnostics, treatment and access to patients.

Methanol poisoning outbreaks - occurring frequently every year - most often afflict the poorest of the poor, i.e. people who buy the cheapest liquor they can find, and then fall victims to criminals that mix ethanol with various amounts of methanol in order to increase profit. We do not fully know how widespread these intoxications are, but there are possibly thousands of people dying every year. Most of these incidents occur in a resource poor setting. Diagnosis is inherently difficult since acute methanol intoxication can mimic many different severe clinical conditions. Even the ability to detect a metabolic acidosis can be problematic, since blood gas machines rarely are available.

MSF has therefore taken a special interest in addressing the problems related to outbreaks of methanol poisoning. By establishing a close collaboration with toxicologists at Oslo University Hospital and providing logistical support and training, an innovative approach to handling outbreaks has been developed - The Methanol Poisoning Initiative. This concept, involving a small unit being sent to support in areas with large outbreaks, has been applied both in Libya and Kenya during major incidents recent years. The next step is a model of training MSF Field Missions in areas where the outbreaks are common. This concept was first applied in September 2015 in the MSF Mission in Nairobi, Kenya. We anticipate that this collaboration will further facilitate innovative operational research by which new diagnostic tools and simplified treatment protocols can be tested in the field during outbreaks and in areas where these poisonings may be characterized as endemic.

Acknowledging a significant number of methanol outbreaks in Asia and Africa, and the presence of toxicology problems in numerous areas where MSF is present, this approach may be the very beginning of an increased collaboration between MSF and clinical toxicologists around the world.
Oral Abstracts

10A-05

CHEMICAL BURNS: FIRST AID REGARDING HUNDRED EXPOSURES

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Objectives: Compare treatment results obtained from different first aid managements using water and/or polyvalent hypertonic amphoteric first-aid solution stopping corrosive reactions registered as a Medical Device.

Method: During 10 months period, chemical burns were registered. Water was used by patient within the first 10 minutes after exposure on site. Polyvalent solution was used 20 minutes after exposure upon arrival at clinic. When both rinsing solutions were used, water was used within 10 minutes after exposure and polyvalent solution after 30 minutes. The clinic being situated only 10 minutes away from the industrial area, some patients came to the clinic without first rinsing with water at accident site. Statistical analysis was performed following large or small samples according to the population. After 6 months’ study (70 cases), we noticed that the following elements could help improve outcome and they were introduced them from December onwards (40 cases): pain factor upon arrival versus pain factor when leaving clinic and visual acuity upon arrival versus visual acuity when leaving the clinic.

Results: We registered 110 cases of chemical burns in industries. 100% male patients, 71 cases rinsed with water only on in (plant), 31 cases rinsed with polyvalent solution only (at the clinic), and eight cases with water first and polyvalent solution upon arrival at the clinic situated 10mn away from the industrial area, in 32 cases, patients came to the clinic without first rinsing with water. The comparative study of the 2 added criteria at the end is based on the cases from Dec 2015 until March 2016 (26 for water, 12 for polyvalent solution and 2 for both water and polyvalent solution). There were 62 ocular, 48 dermal splashes. No patient has shown any side-effects / allergic reaction after using polyvalent solution. Work loss and time of recovery were significantly decreased when polyvalent solution was used compared to water, about a ¼ of the ones with water ($p < 0.01$). When measured, pain score was less important for polyvalent solution before/after washing with water ($p < 0.001$). Visual acuity was also improved ($p < 0.0005$).

Conclusion: Chemical burns classical management can be improved. Number of work-loss days and hospitalization cost when decontaminated with polyvalent solution are decreased. Victims decontaminated with polyvalent solution present pain modification before/after significantly different from those washed with water (less pain) as well as improved visual acuity Clinical study continues to include more patients and additional results.
Oral Abstracts

10B-01

ACUTE DYSNATREMIAS IN CLINICAL TOXICOLOGY

Dag Jacobsen

Oslo University Hospital, Department of Acute Medicine

Abstract: Being the most important extracellular ion it is not surprising that sodium disturbances are the most common electrolyte disorder in clinical medicine – and among these hyponatremia is by far the most common. Within clinical medicine electrolyte disturbances have traditionally been part of nephrology – with the endocrinologists taking special interest in patients with hyponatremia being common in their diseases such as the SIADH syndrome (syndrome of inappropriate secretion of the antidiuretic hormone). Interestingly, most recommendations are based on the assumption that these sodium disturbances, especially hyponatremia, are of chronic nature with no consideration of acute cases.

In brief, sodium disturbances may also be classified as acute (< 48 hrs duration) or chronic (> 48 hrs duration). In the chronic cases the osmotic disturbance is partly compensated for by the production of osmolytes (osmotic active substances) - especially important in hyponatremia. In this situation, the potential danger is not from the condition itself, but from the treatment if corrected too quickly. In the acute disturbances, however, it is the condition itself that may be life-threatening and this should therefore be corrected quickly. As a rule of thumb, sodium disturbances should always be corrected in the same speed they were developed.

In our MICU and observation unit we found that the few acute hyper- and hyponatremias we have treated have mainly been related to clinical toxicology: Acute hypernatremia (s-Na up to 220 mmol/L) have been caused by salt (NaCl) poisoning. Acute hyponatremia was usually related to intake of NPS (newer psychoactive substances) and subsequent thirst and heavy water intake – as also mentioned in the scarce literature on these topics. Interestingly more information is found on the internet. In these cases the treatment often appears to have been wrong and patients have died – usually a negative incitement for publication.

The aim of this presentation is to focus on the difference between acute and chronic sodium disturbances – and strongly emphasize the difference in handling of these cases. Acute disturbances must be diagnosed and treated quickly – in the same time frame that they were developed. Our cases together with cases from the literature will be presented and discussed to support this approach. As such one could argue that acute dysnatremias are an important part of clinical toxicology.

Learning Objectives:
1. Understand why distinction between acute and chronic dysnatremias is important.
2. Understand that in chronic dysnatremias (developed in > 48 hrs), it is the treatment that could be potentially dangerous.
3. Understand that in acute dysnatremis it is the lack of rapid and correct treatment that is potentially dangerous and deleterious.
4. Explain why acute dysnatremias may be considered as an important part of clinical toxicology.
Oral Abstracts

10B-02

UTILIZING QT CORRECTED BY DMITRIENKO FORMULA TO PREDICT TORSADES DE POINTES FROM DRUG INDUCED QT PROLONGATION

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¹ Department of Emergency Medicine, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand, ²Section of Clinical Epidemiology and Biostatics, Ramathibodi Hospital, Faculty of Medicine, Mahidol University, Bangkok, Thailand, ³Department of Emergency Medicine, Emory University, Atlanta, Georgia, USA

Introduction:
QT prolongation may cause torsades de pointes(TdP). Utilizing a formula to calculate corrected QT (QTc) should be accurate enough to predict occurrence of TdP.

Objectives:
1) To determine the best cut-off value of QT corrected by Dmitrienko formula (QTcDMT) as a predictor of TdP
2) To compare the sensitivity and specificity using the cut-off value of QTcDMT with those obtained when using the QT nomogram and QTcBazett.

Methods:
Data were derived from two data sets. All patients in both sets aged over 18 years with the use of QT prolonging drugs. Group 1, all patients had TdP which occurred after QT prolongation. Data in group 1 was obtained from systematic review of reported cases using a Medline search since its establishment until 10 December 2015. In contrast, Group 2 is composed of patients who overdosed on QT prolonging drugs, but did not develop TdP. This data set was previously extracted from a chart review at 3 medical centers from 1 January 2008 to 31 December 2010. Data from both groups were used to calculate QTcDMT. We then found the optimal cut-off point that provides the optimal sensitivity and specificity to predict TdP. Area under the receiver operating characteristic (ROC) curve and McNemar’s test were applied where they are appropriate.

Results:
Group 1, 230 cases of drug-induced TdP were included from the systematic review from Medline after applying our inclusion and exclusion criteria. Group 2 (control group) which did not develop TdP, consisted of 292 cases. After applying the Dmitrienko formula to both groups, the cut-off QTcDMT that provided the highest accuracy (88.31%) with the highest sensitivity (91.30%) and specificity (85.96%) to predict TdP was 475 milliseconds(ms). For the QTcBazett, the cut-off point with the highest accuracy (86.97%) that provided the highest sensitivity (88.26%) and specificity (85.96%) was 490 ms. We found a significant difference ($p$-value=0.0275) between the area under the ROC curves of the QTcDMT (0.936) and the QTcBazett (0.923). The accuracy, sensitivity and specificity of the QT nomogram were 89.08%, 91.30% and 87.33%, respectively. The McNemar’s test failed to demonstrate any differences between QTcDMT and QT nomogram as a better predictor tool for TdP ($p$-value=0.584).

Conclusion:
The cut-off value of QTcDMT at 475 ms could be a useful tool which gives a better TdP prediction for those who have QT prolongation from drugs compared with the QTcBazett. On the other hand, QTcDMT above 475 ms predicts TdP as accurate as the QT monogram.
Oral Abstracts

10B-03

Utilisation of Poison Centre Advice in Hospitals

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2. NSW Poisons Information Centre, Sydney, Australia.
3. Drug Health, Royal Prince Alfred Hospital, Australia.

Objectives: The Poisons Information Centre (PIC) provides toxicological advice to doctors treating patients with poisoning in Australia. This study aims to determine if toxicology consultant advice on the management of severe poisoning is being followed by treating physicians, and whether this impacts on outcomes.

Methods: This is a prospective study from January to June 2016. Patients were identified from the PIC toxicologist daily reports. Cases were followed up if they were 1) severe overdoses with directly cardiotoxic medications 2) haemodynamically unstable patients 3) herbicides and insecticides 4) advised to receive antidotes or invasive treatments.

The treating hospital team was called the following day, to determine whether toxicology advice was followed, and the outcome or condition of the patient.

Results: 60 patients were followed up. In 20 cases (33%) some or all of the consultant advice was not followed; 40 (67%) cases management followed the advice given. The main reason cited for not following advice was disagreement with the suggested management (18/20; 90%).

Treatment areas where doctors in the hospital diverged from suggested management included dialysis, activated charcoal and use of specific antidotes (Table 1). In one case a CT abdomen was not undertaken when advised.

There were 7 deaths (11.6%). Three were considered inevitable. The severity of the poisoning was not initially recognized in 3 patients and treatments that may have been life-saving were delayed or never given. The cause of death was not clear in 1 patient.

Conclusion: Consultant toxicology advice was not followed in a third of cases. This frequently led to increased expense and morbidity, when unnecessary expensive antidotes and invasive treatments were given. In a few cases, treatments were withheld or delayed and this may have contributed to a fatal outcome.

Table 1. Management given by treating doctors that was not in accordance with PIC specialist advice.
### Oral Abstracts

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<thead>
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<th>Treatment advice not followed or delayed by doctor</th>
<th>Treatment initiated by doctor against advice.</th>
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Oral Abstracts

10B-04

THE RECOVERY RATE OF CARDIAC ENZYME & SYSTOLIC DYSFUNCTION AFTER HYPERBARIC OXYGEN THERAPY IN SEVERE CO INTOXICATION

Hyun Kim, M.D., Ph.D.¹, Yong Sung Cha, M.D.¹, Sung Oh Hwang, M.D., Ph.D.¹, Jang Young Kim, M.D., Ph.D.²

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Objectives: This study was to investigate the recovery rate of cardiac enzyme, systolic dysfunction and the clinical characteristics of CO-induced cardiomyopathy after hyperbaric oxygen therapy in severe CO intoxication in South Korea.

Methods: We conducted a retrospective and observational study of 43 patients (male 27, mean age 60 years) who came to the emergency department with severe CO intoxication during the period August 2013 and May 2014. Measurements of troponin-I, left ventricular ejection fraction and wall motion abnormalities were performed to evaluate cardiac function and measured cardiac function at the time of initial, day 1, day 2, and once within seven days of hospitalization. Patients were divided into two group: hyperbaric oxygen therapy (HBO) group (n=33), and non-hyperbaric oxygen therapy (non-HBO) group (n=10).

Results: The incidence of cardiomyopathy was as high as 74.4% (32 of 43 patients) in CO-poisoned patients with myocardial injury based on initial ED results. The recovery rate of troponin-I within 72 hours was higher with the HBO than the non-HBO group (24.24% vs 0%, p=0.04). The recovery rate of systolic dysfunction within 72 hours was not differed between two group (50.0% vs 45.45%, p=0.72).

Conclusion: The recovery rate of cardiac enzyme was faster after hyperbaric oxygen therapy with severe CO poisoning and myocardial injury patients.
Oral Abstracts

10B-05

OBESITY: A RISK FACTOR OF ACUTE LIVER INJURY FROM ACUTE ACETAMINOPHEN OVERDOSE

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2 Division of Science, Mahidol University International College, Thailand

Objectives: Increased risk of hepatotoxicity has been shown in acute acetaminophen overdose patients with body weights more than 100 kg. We evaluate whether obesity is associated with increased risk of hepatotoxicity and acute liver injury (ALI) in acute acetaminophen overdose.

Methods: This is a retrospective cohort study to compare risk of hepatotoxicity and acute liver injury among obese (BMI≥30) and normal BMI (BMI≤24.9) patients with acute acetaminophen overdose at Siriraj Hospital, Bangkok, Thailand during January 2004 to June 2012. All patients were treated with N-acetylcysteine (NAC) based on initial acetaminophen concentration above the 150 mg/L at 4 hour line in the Matthew-Rumack Nomogram. Demographic data, data on acetaminophen ingestion, acetaminophen concentration, NAC therapy, aminotransferase concentrations and clinical outcomes were collected. Psi (Ψ) parameters, a composite parameter of timed-acetaminophen concentration and NAC onset were calculated. High Ψ is defined as Ψ of 5.0 mM/L. Hepatotoxicity means aminotransferase of 1000 U/L or higher. ALI is diagnosed if aminotransferase doubles the baseline level or achieves 150 u/L. Data were analyzed by logistic regressions.

Results: We enrolled 173 cases, consisting of 35 (20.2%) obese and 138 (79.8%) normal BMI cases. Mean(SD) age were 24.8(8.4) years. One hundred and forty-nine (66.8%) of them were female. Obesity group had significantly higher Ψ than the normal BMI group. Otherwise, there were no significant differences in demographic parameters, initial aminotransferases, timed acetaminophen concentrations and onsets of NAC between the obese and normal BMI cases. Hepatotoxicity and acute liver injury developed in 22(12.7%) and 95(54.9%) cases, respectively. Multivariate logistic regression revealed obesity and high Ψ as significant risk factors of ALI, with odds ratios(95% CI) of 2.66 (1.66 to 6.08) and 14.97 (4.34 to 51.76), respectively. Only high Ψ was the significant risk factor of hepatotoxicity with odds ratio(95% CI) 13.31 (3.89 to 45.47).

Conclusion: Obesity is an independent risk factor of acute liver injury in cases of acute acetaminophen overdoses. Prolonged N-acetylcysteine therapy are more likely to be indicated in acute acetaminophen overdose patients if they are obese.
Oral Abstracts

10B-06

CYANIDE POISONING IN PRE AND POST NATIONAL ANTIDOTE PROJECT ERA

S Srisuma¹, A Tongpoo², C Sriapha³, W Wananukul⁴

Ramathibodi Poison Center, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand¹-⁴

Objective: To compare death and antidote reach in cyanide poisoning cases from cyanide ingestion before and after establishment of Thai National Antidote Project.

Methods: This is a retrospective cohort of poisoning cases involved with cyanide or cyanogenic glycoside ingestion reported to Ramathibodi Poison Center from January 1st 2007 to December 31st 2015, which was 3 years and 10 months before Thai National Antidote Project to 5 years and 2 months of the project. Demographic data, symptoms, substance type, treatment, initial severity, and outcome of the case, were recorded. Appropriateness of using antidote was determined, by a panel of medical toxicologists and poison center information scientists, in three subcategory 1) right indication, 2) right dose, and 3) timeliness. Mortality rate, antidote use, and appropriateness of antidote use were compared between the time before and after Thai National Antidote Project was operated. Subgroup analysis of severe cyanide poisoning case was performed.

Results: During study period there were 343 cases involved with cyanide or cyanogenic glycoside ingestion reported to Ramathibodi Poison Center. Median age was 5 years (range from 0.8 year to 79 years), 176 cases (51.3%) were male. There were 130 cases (37.9%) during January 1st 2007 to October 31st 2010, which was the period before Thai National Antidote Project. There were 213 cases (62.1%) during November 1st 2010 to December 31st 2015, which was period of Thai National Antidote Project. After the project started, there were higher antidote uses (RR 1.62, 95% CI 1.15 – 2.28) and higher rate of appropriate antidote uses (RR 1.48, 95% CI 1.03 – 2.14). There were 30 deaths (8.75%). There was no difference in overall mortality rate between the time before and after the project. In subgroup analysis of 85 severe cases, the mortality rate was lower after the project started (52.0% before, and 28.3% after the project, RR 0.54, 95% CI 0.31 - 0.95). Multivariate analysis of mortality in severe cases using age, sex, intent, type of cyanide, and presence of antidote project was performed. Suicidal intent was associated with higher mortality (OR 11.63, 95% CI 2.11 – 64.09). Presence of antidote project was associated with lower mortality (OR 0.24, 95%CI 0.07 – 0.74).

Conclusion: After Thai National Antidote Project was operated, there were higher antidote uses and higher rate of appropriate antidote uses. Though there was no difference in overall mortality rate, the project was associated with lower mortality rate in severe cyanide poisoning cases.
Oral Abstracts

10B-06

CYANIDE POISONING IN PRE AND POST NATIONAL ANTIDOTE PROJECT ERA

S Srisuma¹, A Tongpoo², C Sriapha³, W Wananukul⁴

Ramathibodi Poison Center, Department of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand¹⁴

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11A-01

PRESCRIPTION MEDICINE MISUSE IN THE UK AND EUROPE

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Abstract: Prescription medicine misuse is a major public health problem in the USA and in other areas of the world including Australia and Canada. Until recently there was limited data to be able to determine how common a problem this is in the UK and Europe. Our group have undertaken a number of studies in the UK and there are also emerging data from Europe suggesting that prescription medicine misuse, although less common that in the USA, is an issue in the UK and Europe with drug classes including the benzodiazepines, opioids and GABA-analogues. Data sources include sub-population surveys, poisons centre data and data from the European Drug Emergencies Network (Euro-DEN). This talk will summarise this data and provide an overview of the current situation and limitations of the available data.

Learning Objectives:
1. Understand the data limitations and emerging sources of data on prescription medicine misuse in the UK and Europe

2. Be able to describe drugs most commonly associated with prescription medicine misuse in the UK and Europe.
RECOGNITION AND MANAGEMENT OF OVER THE COUNTER MEDICATION MISUSE

Shaun L Greene

Victorian Poisons Information Centre and Austin Health Clinical Toxicology Service

Abstract: Misuse of Over-The-Counter (OTC) medications is defined as the use of the medication for a purpose not consistent with legal or medical guidelines. Misuse commonly has negative consequences, which may be social, psychological, physical or legal in nature. Misuse may result in dependence, intoxication, psychological disorders including depression and anxiety, and acute or chronic organ injury. Availability of OTC medications varies across international boundaries. Commonly misused OTC medications include compound analgesics containing codeine / paracetamol / ibuprofen, cough suppressants containing dextromethorphan or diphenhydramine, sleep aids containing doxylamine, weight loss preparations containing caffeine and ephedrine and motion sickness tablets containing dimenhydrinate. Misuse of compound analgesic OTC medications containing codeine can lead to opioid related adverse effects including drowsiness and constipation, and overdose characterized by potentially life threatening respiratory depression. Codeine based OTC medications containing ibuprofen can lead to gastrointestinal ulceration and perforation. Excessive chronic ibuprofen ingestion is also associated with life-threatening hypokalaemia occurring as a consequence of renal tubular acidosis (RTA). Published cases illustrate that both proximal and distal RTA can occur following ibuprofen misuse. These cases are characterized by hypokalaemia and a hyperchloremic metabolic acidosis with evidence of excessive urinary potassium excretion. NSAID induced renal injury, which can include nephrotic syndrome and intestinal nephritis are thought to be caused by impaired synthesis of cyto-protective prostaglandins. However the mechanism by which ibuprofen causes RTA is not well understood, but may involve carbonic anhydrase inhibition, the function of which is crucial to renal acid-base regulation. Management of ibuprofen induced RTA involves cessation of OTC drug misuse and provision of supportive care including replacement of potassium and bicarbonate.

Learning Objectives:
1. List commonly available OTC medications associated with misuse and recognize the broad range of harm they may cause.
2. Describe the particular gastrointestinal, respiratory and renal adverse effects associated with codeine containing OTC medication misuse.
3. Understand the postulated causes and biochemical / clinical effects associated with ibuprofen induced RTA.
4. Understand the principles of managing ibuprofen induced RTA.
Misuse of prescription drugs such as opioids, sedatives and stimulants is common in the USA, Canada and Australia. There is limited data available on prescription medicine misuse in Asia, particularly in Singapore. In this talk we will look at the data on prescription medicine misuse in Asia with a focus on two studies that were conducted in Singapore: the first one looks at the prevalence of prescription medicine misuse at a population level (through an internet consumer panel) and the other evaluates the awareness and perceptions of the doctors on prescription medicine misuse in Singapore.
COMPARISON OF TWO DIFFERENT REGIMENS OF NALOXONE IN TREATMENT OF ADDICTED METHADONE-OVERDOSED PATIENTS; A RANDOMIZED CONTROLLED TRIAL

Hossein Hassanian-Moghaddam¹, Navid Khosravi², Nasim Zamani¹, Ali Ostadi³, Mitra Rahimi⁴

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Objectives: We aimed to compare two different protocols for naloxone administration in terms of reversal of signs and symptoms of overdose and frequency of complications in opioid-dependent methadone-intoxicated patients.

Methods: In a randomized controlled trial between September 2015 and March 2016, 100 opioid-dependent patients with signs and symptoms of methadone overdose were included. The patients were consecutively assigned into either the Tintinalli regimen protocol (group 1) or Goldfrank regimen protocol (group 2) of naloxone administration. Patients in group 1 received naloxone with the dose of 0.1 mg given every 2-3 minutes to reverse the respiratory depression. Patients in group 2 received naloxone with the initial dose of 0.04 mg increasing to 0.4, 2, and 10 mg every 2-3 minutes to reverse the patients’ respiratory depression. They were compared regarding the time to reversal of respiratory depression and development of complications.

Results: Basic characteristics and on-arrival vital signs and lab tests of the patients in the two groups were similar except for the median ingested dose of methadone which was significantly less in group 2 (50 mg [35, 100] (10, 200) versus 80 mg [50, 121] (25, 500); P = 0.005). The time to reversal of the signs and symptoms of opioid overdose was significantly less in group 2 (P<0.001). Frequency of withdrawal syndrome and recurrence of respiratory depression were not significantly different between the two groups. Other complications including aspiration pneumonia, nausea and vomiting, arrhythmia, and later apnea had happened mainly in group 2 although with a non-significant P values. Aspiration pneumonia and intubation were more frequent in patients treated by the Goldfrank regimen (P=NS), as well. Two deaths in group 1 and one in group 2 were reported.

Conclusion: Our two groups differed in terms of methadone ingested dose before assignment/treatment, although they were randomized blindly to receive different protocols. This may threatens any conclusions about effect or lack of effect at first look, but considering higher adverse effects in group with lower methadone dose (group 2) could resolve probable discrepancies. It seems that gradual titration of naloxone by Tintinalli protocol can reduce major complications compared to the Goldfrank regimen. However, this protocol was not perfect in reducing complications in opioid-dependent methadone-overdosed patients, either.
Poster Abstracts
PO-01

PACKED RED BLOOD CELL TRANSFUSION IN THE TREATMENT OF ACUTE MALATHION POISONING – A CASE REPORT

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Objective: To present a case of acute Malathion poisoning with severe manifestations, later on developing intermediate syndrome, managed both conventionally and with Packed Red Blood Cell (PRBC) transfusion.

Case Summary: A 32-year-old male plantation worker was found 16 hours prior by co-workers, after drinking an unknown quantity of malathion, agitated, with vomiting, drooling of saliva, and complaining of abdominal pain. He was brought to a nearby hospital, where external decontamination and activated charcoal lavage were done. He was intubated due to depressed sensorium but after giving a total of 17 doses of Atropine 1 mg each intravenously (IV), he improved and afterwards self-extubated before being transferred to UP-PGH. On admission he presented with drowsiness, vomiting, salivation and pinpoint pupils, later with facial muscle fasciculation, consistent with organophosphate poisoning. Intravenous atropine was maintained along with introduction of Phenytoin and Diazepam. Due to its unavailability in the Philippines, oxime was not given. On the 12th hour of admission, he presented with labored breathing, desaturation and persistence of oral and bronchial secretions hence was intubated. Atropine administration and supportive management was continued until the 3rd day, where patient presented with increasing upper and lower proximal limb weakness and respiratory failure evidenced by difficulty weaning off mechanical ventilation. Cranial CT scan and Electroencephalogram were unremarkable. RBC Cholinesterase was at this time noted to be severely depressed at 0.04 ΔpH/hr. 2 units of packed red blood cells (PRBC) were transfused. 36 hours later he gradually regained muscle strength as a repeat RBC cholinesterase showed a significant increase at 0.16 ΔpH/hr. Despite intermittent recurrences of salivary drooling and facial twitching, the gradual improvement of muscle strength prompted extubation on the 8th day. He continued to improve thereafter until he was discharged on the 18th day of admission with no apparent neurologic sequelae and with an RBC Cholinesterase of 0.19 ΔpH/hr.

Discussion: The patient’s clinical course is compatible with Intermediate Syndrome, characterized by the subacute onset of proximal limbs and respiratory muscle weakness after a partial resolution of cholinergic signs of malathion poisoning. It is suggested that exogenous erythrocyte cholinesterase substitution with PRBC transfusion be deemed as an additional therapeutic option in the management of severe organophosphate poisoning with intermediate syndrome.
Development of the Headspace-Solid Phase Microextraction Gas Chromatography Mass Spectrometry (HS-SPME-GC-MS) for Determination of 35 Pesticides in Plasma

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Objectives: To develop sensitive analytical procedures to quantitatively identify 35 pesticide from five major classes including organochlorine, organophosphorus, fungicide, pyrethroid and organonitrogen pesticides in plasma simultaneously by using Headspace-Solid Phase Microextraction Gas Chromatography Mass Spectrometry (HS-SPME-GC-MS).

Methods: This is an in vitro study to develop sensitive analytical procedures to quantitatively identify 35 pesticide standards added to plasma obtained from healthy supposed non exposed subjects by using Solid-Phase Microextraction (SPME) method coupled with Gas Chromatography Mass Spectrometry (GC-MS). Our study included selection of an appropriate coating of required small diameter optical fiber, optimization of parameters and analysis of HS-SPME procedure; extraction and analysis of pesticides by GC-MS analysis; and validation of developed method according to the U.S. Food and Drug Administration guideline and Eurachem (The Fitness of Purpose of Analytical Method) guide 1998. This study was funded by Routine to Research (R2R) Grant, Faculty of Medicine Siriraj Hospital, Mahidol University.

Results: The best setting of our developed HS-SPME-GS method included using Polydimethylsiloxane/Divinylbenzene/Carboxen coated fiber, extraction temperature of 70 degree Celcius for 40 minutes, and the 30% (weight/weight) NaCl added to the extraction solution. This method yielded a good linearity with the coefficient of determination (r²) more than 0.995 at the concentration of 0.05-1 mcg/mL. The coefficient of variance (CV) was less than 15 percent. The percent relative value (%RV) was between 85 and 120 percent. The lower limit of detection was 0.02 mcg/mL. This method could not detect abamectin. Our developed method can detect wider spectrum of pesticides simultaneously by using HS-SPME-GS technique compared with previously published methods. It had good accuracy, high precision with low threshold limit of detection. This can be applied to serum samples from exposed patients.

Conclusion: We successfully developed a method to quantitatively determine 34 pesticides in five major classes including organochlorine, organophosphorus, fungicide, pyrethroid and organonitrogen pesticides in plasma simultaneously by using the HS-SPME-GC-MS, however abamectin was not detected by this technique.
Poster Abstracts

PO-03

EFFECTS OF PARAQUAT BAN ON HERBICIDE POISONING-RELATED MORTALITY AUTHORS

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Objectives: Paraquat is a life-threatening poison. In Korea, paraquat-containing herbicide product registration was canceled in November 2011 while sales were completely banned from November 2012. To evaluate the paraquat ban effect on the herbicide-induced poisoning epidemiology and mortality.

Methods: This retrospective study analyzed patients with herbicide poisoning at 18 Emergency Departments in South Korea between January 2010 and December 2014. The overall and paraquat mortality rates were compared pre- and post-ban. The herbicide mortality-associated factors were evaluated using logistic analysis. To determine if there were any changes in the mortality rates before and after the paraquat sales ban, and to determine the time point of any such significant changes in mortality, the R version 3.0.3 (package, bcp) was used to perform a Bayesian change point analysis

Results: A total of 2257 patients were selected as study subjects and consisted of higher number of males (n=2053, 90.9%). Paraquat poisoning comprised 46.8%. The overall and paraquat poisoning mortality rates were 40.6% and 73.0%, respectively. The decreased paraquat poisoning mortality rate (before 75% vs after 67%, p = 0.041) might be associated with increased intentionality. The multivariable analysis revealed the paraquat ban was one independent predictor that decreased the herbicide poisoning mortality (p = 0.035). In Bayesian change point analysis, the herbicide mortality rate change mainly increased twice, approximately 3 months and 1 year after the paraquat ban enforcement and complete sales ban, respectively.

Conclusion: This study suggests that the paraquat ban decreased intentional herbicide ingestion and contributed to lowering herbicide poisoning-associated mortality. The change point analysis suggests a certain timeframe was required for the manifestation of regulatory measures outcomes.
ACUTE PESTICIDE POISONING WITH ACETAMIPRID: A CASE REPORT

Wan-Yin Kuo¹, Chien-Chin Hsu¹, Hung-Jung Lin¹

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Introduction: Acetamiprid is a relatively new neonicotinoid insecticide which acts as agonists at the postsynaptic nicotinic acetylcholine receptors. Because of its high selectivity for receptors in insects and poor permeability of the blood-brain barrier, Acetamiprid is believed to be of low toxicity to mammals. Cases of poisoning with Acetamiprid in humans are less reported. We describe a case of an elderly woman who presented to the emergency department with acute Acetamiprid poisoning.

Case report: A 77-year-old woman with a history of hypertension, coronary heart disease and parkinsonism ingested approximately 60 g of an insecticide formulation containing 20% Acetamiprid water-soluble powders in an attempted suicide. She experienced persistent vomiting, abdominal pain and muscle weakness immediately. Three hours later, she was transported to the emergency department. On arrival, she had clear consciousness and normal reactive pupils. Her vital signs were as follows: body temperature, 36.1°C; pulse, 59 beats/min.; respiratory rate, 18/min.; blood pressure, 182/90 mmHg. The parameters of blood examination were within normal range. Her plain radiograph of the chest was normal and her electrocardiogram revealed first-degree atrioventricular block. She underwent treatment with gastric lavage and activated charcoal. She was then admitted to the ward and treated conservatively. Thereafter she recovered well and was discharged home.

Discussion: Acetamiprid, one of the members in the class of neonicotinoid insecticides, exhibits agonistic effects on the nicotinic acetylcholine receptors. The clinical features of neonicotinoid-poisoned patients vary between reports. The observed effects in non-severe poisoned patients include gastrointestinal symptoms and minor neurological presentations. In severely poisoned patients, respiratory, cardiovascular and some neurological symptoms such as coma or seizure may occur. There is no antidote for neonicotinoid poisoning. Decontamination and supportive treatment are sufficient for treating such patients. Because of the increasing application of neonicotinoid insecticides worldwide, clinical physicians should understand the clinical features and management of acute poisoning.
Poster Abstracts

PO-05

A PREDICTION OF CLINICAL OUTCOME FROM INITIAL URINE DITHIONITE TEST IN THE PATIENT WITH PARAQUAT POISONING

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Objectives: To determine association between urine dithionite test results and test time with death and systemic involvement in acute paraquat poisoning patients.

Methods: This is a retrospective study of acute paraquat exposure patients with presence of urine dithionite test results reported to Ramathibodi Poison Center during June, 2015 and May, 2016. The urine sample was collected from the patients on arrival at the hospital. A test time of urine dithionite was divided into 2 groups: within 12 hours and later than 12 hours after exposure. A result of urine test was reported as a negative result when the urine color did not change from the control. The positive results were graded by color; group 1 for green or light blue color, group 2 for dark blue color and group 3 for purple or black color. Urine dithionite test results and test time were analyzed for association with death and systemic involvement.

Results: During the study period, there were 64 acute paraquat exposures with urine dithionite test results. Forty-six patients (71.8%) had urine dithionite tests done within 12 hours. Eighteen patients (28.1%) were tested later than 12 hours. Thirty seven patients (57.8%) had a positive result.

There were 15 deaths (23.4%), all had positive urine dithionite test. There were 9 deaths in 46 cases tested within 12 hours, all had purple or black urine color. In 18 cases tested later than 12 hours, there were 6 deaths (2 with green or light blue urine color, and 4 with dark blue urine color).

There were 15 cases with purple or black color results, all were tested within 12 hours. In these 15 cases, 6 cases survived (1 with major outcome, 3 with moderate outcome, and 2 with minor outcome).

In univariate analysis, initial urine color of dithionite test was associated with death ($P<0.01$) and systemic involvement ($P<0.01$). In multiple logistic regression analysis, both urine color and test time later than 12 hours were associated with death and systemic involvement. From our analysis, we derived a risk assessment chart to approximate mortality risk and risk of systemic involvement based on urine color result and testing time.

Conclusion: From multiple logistic regression analysis, initial urine dithionite test results and test time may predict death and systemic involvement in patients with acute paraquat exposure.
Poster Abstracts

PO-06

CLINICAL CHARACTERISTICS OF DERMAL PARAQUAT EXPOSURE

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Objectives: To retrospectively analyze clinical characteristics and factors related deaths from skin exposure to paraquat.

Methods: We performed a retrospective cohort study from Ramathibodi Toxic Exposure Surveillance System during 2008-2015. The diagnosis of dermal paraquat exposure was from the patients’ history and the final diagnosis of our data.

Results: There were totally 133 patients who had dermal paraquat exposure. They were consulted from the hospitals in all regions of Thailand. The systemic toxicity occurred in 30.82% of our patients and the mortality rate was 16.54%. All deaths were men. The patients developed skin for 91.6%, acute kidney injury for 30.77%, liver injury for 17% and dyspnea symptom for 18.80% of all. We performed the subgroup analysis between the dead and survived groups. The average age was statistically significant higher in dead (49.27 + 12.58) than the survivors (37.57 + 16.05), especially in patients who were more than 60 years old (odds ratio (OR): 6.87, 95% confidence interval (CI): 1.17-40.27). The clinical factors associated deaths were the underlying skin diseases (OR, 5.94; 95% CI, 1.36-25.93; p-value 0.018), the numbers of contaminated area > 1 area (OR, 2.72; 95% CI, 1.07-6.94; p-value 0.035), the heart rate in hospitalization > 100 beats/minute (OR, 9.07; 95% CI, 1.76-46.62; p-value 0.008), dyspnea symptom at presentation (OR, 25.43; 95% CI, 4.82-133.97 p-value <0.001), in-hospital gastrointestinal symptoms (OR, 15.88; 95% CI, 2.85-88.49; p-value 0.002), in-hospital jaundice (OR, 8.53; 95% CI, 1.34-54.47; p-value 0.024) and in-hospital neurological symptoms (OR, 9.94; 95% CI, 2.53-39.11; p-value 0.001).

The laboratory associated deaths were dysnatremia (OR, 10.02; 95% CI, 2.61-38.55; p-value 0.001), dyskalemia (OR, 6.51; 95% CI, 1.86-22.80; p-value 0.003), metabolic acidosis (serum bicarbonate < 20 mmol/l) (OR, 7.07; 95% CI, 1.88-26.54; p-value 0.004), acute kidney injury (AKI) (p-value <0.001), liver injury (p-value < 0.001), day of peak BUN (p-value 0.003), peak BUN (p-value < 0.001), day of peak creatinine (p-value 0.006) and peak creatinine (p-value < 0.001).

Conclusion: Dermal paraquat exposure caused both local and systemic effect. The mortality rate and damage to multiorgan systems were not less. The underlying skin lesions, tachycardia during hospitalization, some in-hospital clinical symptoms, the abnormal electrolyte values were independently associated with deaths. AKI and liver injury might be the prognostic factors.
Poster Abstracts

PO-07

PROGNOSTIC VALUE OF URINE PARAQUAT CONCENTRATIONS COMBINED WITH POISONING TIME AND CREATININE CLEARANCE RATE WITH ACUTE PARAQUAT POISONING

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Objectives: To measure the paraquat concentrations in urine and evaluate the prognostic value of urine paraquat concentrations combined with poisoning time and creatinine clearance rate to acute paraquat poisoning (APP).

Methods: Clinical date such as urine paraquat concentrations, poisoning time and creatinine clearance rate from 96 patient were collected, then we define the toxic index as (urine paraquat concentrations × poisoning time / creatinine clearance rate) and evaluate it`s prognostic value.

Results: Logistic regression analysis shows either urine paraquat concentrations and toxic index was related to the prognosis, and the area under the receiver operating characteristic curve (ROC) of toxic index was greater.

Conclusion: The urine paraquat concentrations, toxic index has prognostic value for APP patients, the prediction value of toxic index is greater.
Poster Abstracts

PO-08

ORGANOPHOSPHATE POISONING IN AN URBAN MALAYSIAN HOSPITAL: WHAT WE HAVE LEARNT

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Objectives: To determine treatment interventions which provided the best outcome for patients with organophosphate poisoning. To determine the risk of aspiration pneumonia with gastric lavage and charcoal for patients with organophosphate poisoning. To determine factors affecting successful extubation for patients with intermediate syndrome.

Methods: A retrospective, observational study of all organophosphate poisoning from the period of April 2013 to December 2015 presenting to Hospital Tengku Ampuan Rahimah Klang was conducted. All patients above the age of 12 years with history of insecticide poisoning were included.

Results: The initial practice of gastric lavage and charcoal administration was found to be associated with an increased incidence of aspiration pneumonia. The later emphasis of good supportive care especially ventilatory support and judicious atropine administration was found to provide good outcome with minimal complications.

Conclusion: Good supportive care and judicious administration of atropine was found to provide good outcome to patients with organophosphate poisoning.
Poster Abstracts

PO-09
PROGNOSIS VALUE OF URINE PARACLUT SEMI-QUANTITATIVE IN THE PAFIENTS WITH ACUTE PARACLUT POISONING

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Objectives: To investigate the relationship between semi-quantification of urine paraquat and the severity of acute paraquat poisoning. and to evaluate the prognostic value of the test in patients with acute paraquat poisoning.

Methods: A total of 186 patients with acute paraquat poisoning were categorized into four groups according to their semi-quantification results of urine paraquat: +group(n=37), ++group(n=25), +++group(n=27), and ++++group(n=97). The clinical features, severity of hepatic and renal injuries and respiratory failure were compared between these four groups. Kaplan-Meier analysis was used to evaluate the survival rate. Receiver operating characteristic (ROC) curve was used to analyze the urine paraquat concentration in the value in prognosis evaluation of the patients with paraquat poisoning.

Results: The 60-day mortality was 49.46%. No patient in+group was found to have serious complications, the incidence of acute respiratory failure, renal failure, and hepatic failure in ++++group was significantly higher than that in +group, ++group, and +++group (P<0.05). The urine paraquat concentration was positively correlated with severity of hepatic and renal injuries (r=0.574, r=0.756, respectively, P<0.001). Kaplan-Meier survival analysis showed that the mortality of ++++group (78.35%) was significantly higher than that of +++ group (55.56%), ++group (4.0%) and +group (0) (P<0.05). The urine paraquat concentration of the areas under the ROC curve and 95%CI were 0.976(0.961,0.991).

Conclusion: The semi-quantification of urine paraquat is a promising test in evaluating the severity of acute paraquat poisoning. This test can be used to guide therapy and to predict the outcomes of patients suffering acute paraquat poisoning.
ANALYSIS OF HYDROGEN SULFIDE POISONING FROM 1986 TO 2015 IN TAIWAN: A CLINICAL POISON CENTER DATA-BASED RESEARCH

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Objectives: Hydrogen sulfide (H\textsubscript{2}S) gas are common exist in hot spring area, and underground working environment. People may get exposed to higher concentration of H\textsubscript{2}S in confined spaces due to poor ventilation, which may result in health hazards or even lethal. H\textsubscript{2}S intoxication is not uncommon and is one of major occupational hazards in Taiwan. However, there was no epidemiologic study that had specifically evaluated H\textsubscript{2}S intoxication in Taiwan.

Materials and Methods: This is a poison control center (PCC)-based, retrospective cohort study of H\textsubscript{2}S exposure cases between 1986 and 2015. We analyzed the trend and baseline characteristics of H\textsubscript{2}S poisoning cases, and compared the differences in exposure scenario and clinical signs between patients with minor and major effects, as well as the differences between severe and fatal cases. Multivariate logistic regression was applied to identify the predictors of poisoning severity. We also searched news report of H\textsubscript{2}S intoxication from the internet and compared the data with those reported to the PCC to identify their consistency and the possible causes of each event. Finally, we employed multinomial logistic regression analysis to find factors related to the rate of out-of-hospital-cardiac arrest (OHCA) among patients with H\textsubscript{2}S intoxication.

Results: A total of 157 cases (involved in 78 events) of H\textsubscript{2}S intoxication were reported to the PCC from 1986 through 2015; 39 of them died after poisoning. Among them, 70% were males, the mean age was 37 years old, and more than 90% were occupational exposure. Most exposures occurred in chemical industry (including wastewater treatment plant) (46.5%). In the comparison between patients with different severity, patients with major effects were more prone to be poisoned in confined spaces (OR 7.1, p=0.0006) and presented with metabolic acidosis (OR 25.4, p=0.0156). Besides, fatal cases tended to manifest respiratory failure (OR 20.4, p=0.0029), but there was no statistically significant difference between the two groups in terms of confined spaces and metabolic acidosis. Almost all events of H\textsubscript{2}S intoxication occurred in the absence of adequate ventilation, pre-working detection of hazardous gas concentration and wearing personal protective devices.

Conclusion: In this PCC-based study, we found that severity of poisoning was closely related to confined spaces, metabolic acidosis and respiratory failure. Moreover, most OHCA cases were labor; and poor ventilation and inadequate self-protection accounted for most occupational exposures. Our study findings indicate that adequate education and prevention is the cornerstone in avoiding H\textsubscript{2}S intoxication.
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PO-11

Outcome of Self- and Planned Extubation in Organophosphate-Poisoned Patients

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Objectives: Respiratory failure is the most common cause of morbidity and mortality in organophosphate (OP)-intoxicated patients. We aimed to assess and compare the need for re-intubation and outcome between patients with self-extubation (SE) and planned extubation (PE).

Methods: In a cross-sectional observational study, all endotracheally intubated patients with OP poisoning who had been admitted to poisoning intensive care unit were included. The frequency and time of SE, need for re-intubation, and its impact on hospital stay and outcome were assessed.

Results: In fifteen patients (48.4%) SE was reported. Need for re-intubation in these patients was more frequent than those who underwent PE (60.0% vs. 37.5%, respectively) but without a statistically significant difference (P=0.2). Early unplanned SE significantly correlated with occurrence of pulmonary complications (P=0.04). The rate of aspiration pneumonia was high (80%) in SE cases. Hospital stay was also significantly prolonged in these patients (14.6 vs. 5.4 days, P=0.04).

Conclusion: Planning for on time weaning and extubation in OP-poisoned patients can prevent unplanned SE and decrease the occurrence of lung complications.
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PO-12

IMAGING STUDIES AND DIAGNOSIS OF LEAD TOXICITY WITH INGESTION SOURCE

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Objectives: The aim of this study was to compare abdominal X-ray with abdomino-pelvic computed tomography (CT) scan in those who had blood lead levels and either abdominal X-ray or abdominal CT available.

Methods: All patients with available blood lead level and confirmed diagnosis of lead toxicity (with elevated BLLs and clinical manifestations of lead poisoning) and aged 12 or older who had undergone abdominal X-ray or non-contrast abdomen and pelvic CT scan in their imaging profile were included.

Results: During an ongoing lead outbreak from March to June 2016 and in a prospective observational study a total of 80 lead-poisoned male patients were included. All patients were addicted to oral opium. X-ray and non-contrast CT files reviewed by a single radiologist, who was asked to search for possible lead particles in imaging studies. Of whom, 51 (63.7%) underwent CT scanning with 34 (66.7%) positive CTs and 42 (36.3%) X-rays with 20 (47.6%) positive X-rays. The most significant independent variables predicting CT finding were constipation and daily dose of the ingested opium. There was a significant correlation between two deaths and abdominal pain (p= 0.021, r=-0.258)

Conclusion: Adding prognosticate factors, it can be concluded that in male suspected cases of lead toxicity due to opioids who usually refer with abdominal pain, a positive imaging result can guide us to start decontamination and chelating therapy if blood lead level is not readily available.
D-PENICILLAMINE; A LEGENDARY SUBSTITUTE FOR STANDARD CHELATING THERAPY IN LEAD POISONING

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Objectives: The aim of this study is to evaluate the efficacy of D-penicillamine in treatment of lead poisoning mainly in the outpatient setting.

Methods: In a cross-sectional study during the recent epidemic flaw of lead poisoning in Iran, the lead-poisoned patients referring to our clinic were treated by D-penicillamine capsules, 250 mg/QID for 5 or 10 days. They were recommended to check another blood lead level (BLL) almost four weeks after termination of the treatment and refer to our clinic again.

Results: A total of 67 patients were evaluated. Median [IQR] BLL was 106.00 [84, 131] µg/dL at the initiation of therapy that reached to a mean of 52.6 ±28.8 µg/dL after a median [IQR] treatment period of 7 [5, 10] days (P< 0.001). There was no statistically significant difference between the 5- and 10-day protocols regarding complications and improvement. Treatment had resulted in a median [IQR] reduction of 54 µg/dL [33, 90] (range; -20 to 231 µg/dL) in the patients’ BLL which is a 33.9-percent (range; -29.69 to 99.06– percent) reduction in this measure.

Conclusion: D-penicillamine is probably a safe and efficient treatment in lead poisoning particularly in special situations such as epidemics and shortage of first-line antidotes.
LEAD POISONING DUE TO INCENSE STICK BURNING

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Background: In Asia region, incense burning is an important folk activity and has been noted to relate with several health impacts, including chronic respiratory diseases and neoplasms. Heavy metal exposure, or even increased blood lead levels in children had also been demonstrated a dose-dependent relationship with frequent incense burning at home. But, there was no documented case report of lead poisoning just only due to incense burning.

Case Report: A 65-years-old housewife was admitted to the hospital due to severe anemia, lower legs pitting edema, bone soreness, abdominal pain and exertional dyspnea for several months. Severe anemia with basophilic stippling in red blood cell and blood lead level about 60 μg/dL was finally diagnosed after weeks’ workup. She is now under chelating therapy. Tracing back her histories, she was a clergy of Buddhist or Daoist and has been exposed to the smoke of more than 30 sticks of burning incense every day for more than 20 years. Negative other lead exposure was noted after survey, including herbs or contaminated drinking water. Her husband who worked with her was also found with blood lead level more than 80 μg/dL.

Discussion & Conclusion: Lead and other heavy metals contamination have been found in incense sticks. In addition to the prevalence of airway diseases and neoplasms, chronic and frequent exposure to smoke of incense burning might result in lead poisoning.
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PO-15

REDUCING CELL MACROMOLECULE DAMAGE PROTECTS RATS AGAINST MONOCROTOPHOS INDUCED TYPE 1 PARALYSIS

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Acute severe organophosphate pesticide induced Type I paralysis is a common medical condition in most of Asia particularly India that can lead to Type II paralysis which is associated with significant morbidity and mortality. Type I paralysis is a consequence of cholinergic hyper stimulation and prevention would improve outcome of poisoned patients. This paper will present an animal model of stress induced protection against monocrotophos induced Type I paralysis.

Objectives: To study the mechanism of noise stress induced protection against Type I paralysis in monocrotophos poisoned rats

Methods:
1. Rats were exposed to noise stress (75-90dBA, 3-4hrs / day, six days a week, 8 months).
2. Non-stressed control and noise-stressed rats were subject to severe monocrotophos poisoning (0.8LD50)
3. The development and temporal profile of cholinergic symptoms and muscle weakness were observed in all rats.
4. Rats were sacrificed on recovery from muscle weakness and blood and muscle acetylcholinesterase levels, muscle oxidative damage, anti-oxidant levels and mitochondrial function and activity determined.
5. The results were analyzed for significant differences between stressed and non-stressed rats by Student’s t test for parametric data and by the Mann-Whitney test for non-parametric data. Significance at p< 0.05.

Results: Noise stress significantly
- Reduced lipid peroxidation 3 fold and elevated glutathione peroxidase 3.5 fold in rat muscle.
- Lowered oxygen uptake through mitochondrial Complex 1 40%, reduced Complex 1 activity 60% and increased Complex IV activity 2.7 fold in rat muscle. On monocrotophos poisoning:
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- Onset of cholinergic symptoms of chewing, body tremors, salivation and lacrimation were delayed significantly by 2.5, 5.5, 5 and 7 minutes respectively and muscle weakness by 10 minutes in stressed compared to non-stressed rats.
- Stressed rats did not develop paralysis while non-stressed rats developed paralysis.
- Inhibitions of blood (>80%) and muscle (>50%) cholinesterases were similar in stressed and non-stressed rats.
- Oxidative damage was not induced in muscle of stressed or non-stressed rats.
- Muscle mitochondrial function and complex activities were not affected in stressed or nonstressed rats.

Conclusion: This study indicated that noise stress improved the structure of cell macromolecules through reduced oxidative damage and protected muscle from the effects of monocrotophos induced cholinergic hyper stimulation despite significant inhibition of acetylcholinesterase. The role of macromolecule structural integrity in reducing organophosphate pesticide induced muscle weakness and the potential of drugs that raise and maintain a high redox potential of muscle to prevent muscle weakness will be discussed.
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PO-16

FINDING OF THE SILVER BEADS

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Objectives: Mercury exposure is considered a rare occurrence to the general public in view of strict legislative control and accessibility. Such hazard has potential ramifications to the social and environmental aspects of the surrounding area, which also includes all first responders from varying backgrounds.

Methods: In May 2016, cases exposed to elemental mercury began presenting to Emergency Department, Hospital Bukit Mertajam over 7 days totaling 72 patients. The index cases were 3 male teenagers aged between 16-19 years, who accidentally discovered a mercury spillage in a palm oil plantation. The mercury was brought back home, then divided and distributed at various times among their families and friends. The substance was also brought to school where another 58 students & teachers. Eventually, teacher identified the substance and alerted the police, medical and hazardous materials (HAZMAT) teams.

Results: There were 44 patients out of 72 which were symptomatic, many of which presented with respiratory-related symptoms. Blood mercury levels, urine spot tests for mercury and 24-hour urine for mercury level were conducted. Only 1 patient came back positive for urine spot test for mercury (0.004 mg/litre), while the remaining tests were placed on hold due to facility limitations. All cases were treated symptomatically and none required chelation therapy.

Conclusion: This recent incident highlight that mercury exposure may be under reported due to illegal usage. This may just only be the tip of the iceberg. Hence, this incident has brought to light the necessity of continual preparedness of the current healthcare system in responding to a toxicological emergency. This will encompass medical emergency and decontamination drills, optimal equipment availability and a strategic organizational response in ensuring the safety and containment of healthcare personnel and exposed victims.
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PO-17
ATTEMPT SUICIDE BY POISONING OF SELF PREPARED ARSENIC TRIOXIDE SOLUTION

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Introduction: Arsenic (As) is a traditional poison that has a history extending back to ancient times. The name “arsenic” is derived from arsenikon, Greek for potent.

Case report: A 43-year-old male was transported to our Emergency Department 50 minutes after ingestion of 300ml self prepared arsenic trioxide (砒霜) solution. On arrival, he was alert & conscious but appeared dehydrated due to repeated vomiting. He had tachycardia with heart rate of 122 beats per minute but normal blood pressure and oxygen saturation.

A plastic bottle containing arsenic trioxide solution, as shown in Figure 1, was brought in by ambulance crews. He produced the solution from heating xionghuang (雄黃), an arsenic sulfide mineral (As4S4) which is a Chinese herb, for academic purposes a few years ago.

Figure 1 A plastic bottle containing arsenic trioxide

Figure 2 Dimercaptopropanesulphonate Sodium (DMPS)
Intra venous fluid replacement for rehydration, decontamination with gastric lavage & subsequent administration of activated charcoal were performed to patient. Chelation therapy with intra-venous dimercaptopropanesulphonate sodium (DMPS), as shown in Figure 2, was given 90 minutes after arrival to hospital. Symptoms of vomiting & diarrhea persisted after admission. He developed lower limbs weakness with severe hypokalemia (potassium level of 2.0umol/L). He regained full power after correction of serum potassium.

24 hours urine arsenic level was found to be 120295nmol/day.
Seventeen doses of intravenous DMPS were given to patient for 5 days, followed by oral form for 11 days. Spot urine arsenic to creatinine ratio significantly decreased from 343124 nmol/mmol (day 1) to 7116 nmol/mmol (day 3) as shown in Figure 3. He was assessed by psychiatrist and diagnosed recurrent depressive disorder. Toxicology follow up clinic was arranged for him. He had an uneventful course without any neurological deficit.

Conclusion:
Treatment of acute arsenic poisoning includes supportive care, decontamination and chelation therapy. DMPS is an antidote for arsenic poisoning and its use should be directed by clinical status and urinary arsenic excretion.
PREVALENCE OF NEW PSYCHOACTIVE SUBSTANCES IN A COHORT OF PATIENTS PRESENTING TO AN URBAN EMERGENCY DEPARTMENT (ED) WITH ACUTE RECREATIONAL DRUG TOXICITY

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Objective: There has been exponential growth in the availability of new psychoactive substances (NPS) globally. In 2014, 101 new substances were reported for the first time to the European Monitoring Centre for Drugs and Drug Addiction Early Warning System (EMCDDA EWS) and over 600 NPS have been reported worldwide to date. There is limited data available on the prevalence of acute toxicity associated with NPS use. The aim of this study was to determine how commonly NPS were detected in a cohort of patients presenting to the Emergency Department (ED) with acute recreational drug toxicity.

Methods: We conducted a prospective study enrolling consecutive adults presenting to a London, UK inner-city ED with acute recreational drug toxicity. Surplus serum samples were anonymised and sent for comprehensive drug screening. Samples were prepared by liquid/liquid extraction and screened using UPLC with time-of-flight (TOF) mass spectrometry and measured against a database containing >1400 drugs/metabolites. High-resolution accurate mass-spectrometry tandem-liquid-chromatography (HRAM-LCMSMS) was used to analyse for synthetic cannabinoid receptor agonists (SCRAs). Gas chromatography-mass spectrometry (GC-MS) was used for GHB detection. For the purpose of this study, new psychoactive substances (NPS) are drugs reported to the EMCDDA EWS since 2003; established (classical) recreational drugs were the amphetamines, cocaine, heroin, cannabis, ketamine, LSD and GHB. This study had local UK National REC/IRB approval.

Results: Serum samples were available for analysis from 191 patients, 153 (80.1%) male, median age 32 (range 18–65) years. Of these, 179 samples had sufficient serum for SCRA analysis and 131 for GHB analysis. Established drugs were detected in 151 (79.1%) and NPS in 91 (47.6%, non-mephedrone NPS 33/191, 17.3%). The most commonly detected drug class were the amphetamines (96/191, 50.3%: methamphetamine 57/191 (29.8%), amphetamine 3/191 (1.6%), MDMA 30/191 (15.7%), MDEA 2/191 (1.0%), PMMA 27/191 (14.1%); cathinones (70/191, 36.6%: mephedrone 66/191 (34.6%), methylene 4/191 (2.1%), ethylene 6/191 (3.1%), dimethylene 1/191(0.5%)}
and butylone 1/191 (0.5%)); followed by cocaine (65/191,34%), opioids (42/191,21.5%), and ketamine (12/191,6.3%). SCRAs were identified in 18/179 (10.0%): 5F-AKB-48 (13/179,7.3%), 5F-PB-22 (7/179,3.9%), MDMB-CHMICA (7/179,3.9%), AB-CHMINACA (3/179,1.7%), Cumyl-5F-PINACA (1/179,0.6%) and BB-22 (1/179,0.6%). Other NPS included ethylphenidate (2/191,1%), methylphenidate (1/191,0.5%), methiopropamine (4/191,2.1%), alpha-pyrrolidinopentiophenone (1/191,0.5%), etizolam (1/191,0.5%) and phenazepam (3/191,1.6%). GHB was detected in 32 (24.4%).

**Conclusion:** Use of, and acute toxicity associated with NPS may be more common than currently available data suggests – NPS were detected in almost half of this cohort of patients presenting to the ED with symptomatic acute recreational drug toxicity.
Objectives: There has been increasing interest in the availability of non-prescription novel benzodiazepines and their sale as new psychoactive substances (NPS) in Europe. The aim of this study was to determine the availability and motivations of use for three novel benzodiazepines diclazepam, flubromazepam and pyrazolam in the UK from Internet suppliers.

Methods: In November 2014 using European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) Snapshot Methodology, Internet search engines (google.co.uk, uk.yahoo.com and ask.com.uk) were searched in English using the terms “buy diclazepam”, “buy flubromazepam” and “buy pyrazolam”. Data from sale forms were then converted into price per gram/pellet to allow comparison of cost between different purchase amounts, and repeated in March 2016 to assess for any supply changes. Relevant threads from leading drug user forums bluelight.org, drugs-forum.com, erowid.org and legalhighsforum.com were analyzed using a general inductive approach to determine motivations for use.

Results: In November 2014 there were 49 websites selling diclazepam, 33 websites selling pyrazolam and 39 selling flubramazepam. 74.5% of the sites appeared to originate from the UK and/or Europe. The drugs were sold in varying strengths and forms including pellets (50 Internet sites), powder (10) and blotters (2). One Internet site sold diclazepam and flubromazepam in pill form. In March 2016, an increase in websites per novel benzodiazepine was noted, with 55 websites selling diclazepam (33 new, 60%), 35 websites selling pyrazolam (19 new, 54.3%) and 45 selling flubramazepam (28 new, 62.2%). Over half of sites were also based in the UK/Europe (38, 63.3%). Drugs were sold as pellets (49 Internet suppliers, 81.7%), powder (19, 31.7%) and blotters (1, 1.7%). Pill forms were no longer available during this survey, however one Internet site sold diclazepam and flubromazepam in liquid form (1, 1.7%). The cost of novel benzodiazepine reduced with increasing purchase quantities e.g. the mean price per pellet was £5.05 ± £3.22 (for 1 pellet) to £0.11 ± £0.08 (for 100,000 pellets).
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for 1 mg diclazepam (March 2016). The main motivations for use included anxiolysis, euphoria and management of stimulant withdrawal.

Conclusion: These three novel benzodiazepines are widely available online, most commonly as pellets. There has been an increase in number of Internet sites between the two surveys. One site sold diclazepam and flubromazepam in liquid form, indicating sale intended for human consumption. This study could be used to support triangulation of data from other sources to tackle their extensive availability and inform harm minimisation strategies.
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ROLE OF ELECTROENCEPHALOGRAPHY IN PROGNOSTICATION OF METHADONE COMATOSE PATIENTS

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Objectives: Electroencephalography (EEG) is a prognostic tool in comatose patients. The value of this old technique is less investigated in poisoned patients. We aimed to determine EEG findings and clinical manifestations in methadone poisoned patients.

Methods: In a prospective observational study, demographic characteristics, clinical findings, lab tests, EEG findings (for 30 minutes) and outcome of 30 methadone unconscious patients (dead vs. alive) were retrieved. EEG was interpreted based on ACNS Standardized Critical Care EEG (version 2012) by one of the co-authors and non convulsive status epilepticus (NCSE), non convulsive seizure (NCS), Intercital epileptiform discharges, Diffuse low voltage cerebral activity, Burst-suppression, Diffuse slow background, Non-specific focal slowing, temporal intermittent rhythmic delta activity (TIRDA), frontal intermittent rhythmic delta activity (FIRDA), Triphasic Wave, Generalized periodic discharges, lateralized periodic discharges (LPDs) and bilateral independent periodic discharges (BIPDs) were evaluated for each case. Results of the EEG were compared between dead and alive patients.

Results: Six patients (20%) died. In dead versus alive patients, Intercital Epileptiform Discharges was happened in [2 (33%) vs. 18 (75%)], NCS in [0 vs. 1 (4.2%)], Diffuse low Voltage Cerebral Activity in [1 (16.7%) vs. 1 (4.2%)], Predominant Theta in [4 (66.7%) vs. 10 (41.4%)], Predominant delta in [0 vs. 1 (4.2%)], LPDs in [1 (16.7%) vs. 0], FIRDA in 3 [0 vs. 3 (12.5%)], diffuse alpha activity in [0 vs. 3 (12.5%)], diffuse beta activity in [0 vs. 1 (4.2%)], showing no statistically difference in dead and alive patients.

Conclusion: It seems that there is no relation between EEG findings and outcome of the methadone intoxicated patients. Unlike many other causes of loss of consciousness, EEG failed to demonstrate a prognostic role for outcome prediction. Even severe encephalopathic EEG patterns may lead to complete recovery. This should be considered in comatose methadone intoxicated patients and conservative therapies should be continued.
Poster Abstracts

PO-21

CAN DURATION OF HEMODIALYSIS BE ESTIMATED BASED ON THE ON-ARRIVAL LAB TESTS AND CLINICAL MANIFESTATIONS IN METHANOL-POISONED PATIENTS?

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Objectives: We aimed to evaluate the efficacy of Lachance formula and more readily available clinical or laboratory factors (other than serum methanol level) in prediction of the needed time for hemodialysis in methanol-poisoned patients.

Methods: In a retrospective study, all methanol-poisoned patients referred to us between March 2008 and March 2016 were enrolled. The patients’ demographic characteristics, on-arrival vital signs, signs/symptoms on presentation, and on-arrival lab tests were evaluated to find factors that could prognosticate the dialysis duration in these patients.

Results: Of 72 patients enrolled, 54 underwent hemodialysis once (group 1) and 18 needed more than one session of hemodialysis (group 2). Lachance formula overestimated the patients in higher methanol levels and underestimated them in lower methanol levels. It properly predicted the needed time for hemodialysis when the methanol level was between 15 and 25 mg/dL. Group 1 and 2 were different in terms of their ingested alcohol dose (P=0.001), creatinine (P=0.02), dyspnea on presentation (P=0.002), and the place they had been dialyzed (P=0.013). Dialysis duration significantly correlated with dyspnea on presentation (P=0.028) and ingested alcohol dose (P = 0.02). After performance of logistic regression analysis, only creatinine was statistically significantly different between the two groups (P=0.02). Median creatinine levels were 1.3 [1, 6] (0.8- 2.7) and 1.4 [1.35, 2.1] (0.8- 6.5) in the patients who were dialyzed once and twice, respectively.

Conclusion: As a conclusion, creatinine is possibly a readily available test that can predict the appropriate time needed for hemodialysis in methanol-poisoned patients.
Poster Abstracts

PO-22

ABDOMINOPELVIC COMPUTED TOMOGRAPHY FINDINGS AND CLINICAL MANIFESTATIONS IN METHAMPHETAMINE BODY STUFFERS

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Objectives: Little is known about methamphetamine body stuffers and correlation of clinical manifestations with imaging studies. We aimed to determine abdominopelvic computed tomography (CT) findings and clinical manifestations in methamphetamine body stuffers.

Methods: In a routine data base study, demographic characteristics, clinical findings, and CT results of 70 methamphetamine body stuffers were retrieved from the hospital files and evaluated. According to the clinical manifestations, the patients were categorized into either benign- or severe-outcome group. Those with hypertensive urgency (systolic blood pressures above 180 mmHg or diastolic blood pressure above 120 mmHg) and any end organ damage were put in the severe-outcome group. End organ damage was defined as seizure, decreased level of consciousness mandating intubation, rhabdomyolysis (creatine phosphokinase [CPK]>5000 U/L), increased troponin (> 0. 1 ng/mL), doubling of the level of creatinine, increased liver transaminases (>1000 U/L), or death. Also, they were determined to have positive or negative CT results. In the group with positive results, number and place of the baggies were determined, as well. Results of the CT were compared between the two groups.

Results: Almost 43% of the patients had positive abdominopelvic CT results (between 1 to 6 baggies). Place of the baggies was determined in 21 cases (9 in the stomach, 3 in the colon, 2 in the ileum, 2 in the cecum, 2 in the stomach and colon, 1 in the stomach and ileum, 1 in the cecum and colon, and 1 in the rectosigmoid). Mean density of the packs was 176.2±152.7 HU. Based on the clinical grounds, 57% of the patients were in the benign- and 33% were in the severe-outcome group. In the benign group, 45% of the patients had positive CTs while in the severe-risk group, this was 40% (P>0.05). Although except variables defined as severe outcome (seizure, intubation, Cr, AST, CPK, troponin) also agitation, on-arrival pulse rate, LDH, HCo³, base excess, loss of consciousness and hospitalization period were correlating factors, but in regression analysis, we couldn’t find a significant variable that prognosticate severe outcome.

Conclusion: It seems that there is no relation between CT findings and clinical manifestations of the methamphetamine body stuffers. Also, CT scanning cannot be relied on for diagnosis and determination of the prognosis in body stuffers and even negative CT findings may lead to severe outcomes. Clinical findings particularly pulse rate may prognosticate outcome.
**Poster Abstracts**

**PO-23**

**OBSTRUCTIVENEPHROPATHY, KIDNEY INJURY AND EMPHYSEMATOUS PYELONEPHRITIS ASSOCIATED WITH KETAMINE ABUSE**

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**Introduction:** Ketamine, as an anesthetic agent, is increasingly abused because of its side effects, like hallucination, and dissociation. Ketamine was also known to be responsible for the development of inflammatory cystitis, hydronephrosis, and kidney injury [1, 2]. We presented a young man, with all the upper complications, having emphysematous pyelonephritis and septic shock.

**Case Report:** A 36-year-old man with a history of ketamine abuse presented with gradually onset of abdominal pain. Vital signs showed a body temperature of 38.3 centigrade, a heart rate of 68, a respiratory rate of 20, a blood pressure of 126/68. Bilateral costo-vertebral tenderness and diffuse tenderness of abdomen were noted. Laboratory studies revealed an impaired renal function (Urea 77 mg/dL, creatinine 5.0), pyuria (WBC > 100/HPF), an elevation of white blood cell count and C-reactive protein. A non-contrast-enhanced tomography of abdomen revealed no hollow organ perforation, but bilateral hydronephrosis with emphysematous pyelonephritis. Genitourinary surgeon performed bilateral pig-tail nephrostomy. Ureteroscope done later revealed bilateral stricture at upper part of the ureter. The patient recovered uneventfully.

**Discussion:** Ketamine metabolites may deposit in ureters, and cause following hydronephrosis [3]. In our case, the hydronephrosis lead to acute renal injury, urosepsis and emphysematous pyelonephritis. An accurate diagnosis from proper image and a prompt nephrostomy were the best treatment for the patient.

Poster Abstracts

PO-24

AMPHETAMINE-INDUCED Rhabdomyolysis and Myoglobinuric Acute Renal Failure: A Case Report.

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Introduction: Amphetamine is one of the causes of drug-induced rhabdomyolysis. The clinical features of rhabdomyolysis range from muscle weakness to fulminant life-threatening acute renal failure. We reported a case of amphetamine-induced rhabdomyolysis and myoglobinuric acute renal failure.

Case Report: A healthy 23-year-old man, a prior amphetamine drug abuser, presented with agitated confusion with Glasgow Coma Scale of E2V3M4. Amphetamine urine screen test showed positive. Impaired renal function was noted, with serum creatinine level of 3.32 mg/dL (reference: 0.6~1.3). Elevated serum level of muscle enzymes was also noted, with myoglobin level of 11033 μg/L (reference: < 90). We prescribed normal saline hydration and alkalinization. On the 4th day, the serum level of myoglobin raised to > 100000 μg/L. In addition, the serum level of creatinine raised to 12.76 mg/dL and he developed acute pulmonary edema with respiratory failure. After 3 sessions of emergent hemodialysis, the pulmonary edema resolved gradually. Rhabdomyolysis with acute tubular necrosis was confirmed by renal biopsy examination. He received hemodialysis for 1 month. His renal function recovered, with serum creatinine level decreasing to 1.72 mg/dL. The condition of rhabdomyolysis also improved, with serum myoglobin decreasing to 98 μg/L. The hemodialysis was stopped later.

Discussion: Amphetamine abuse has been rising over the past decades. Symptoms of acute toxicity may be mild. However, critically ill patients may exhibit seizures, coma, and renal failure related to rhabdomyolysis. Patients with myoglobinuric renal failure require aggressive crystalloid administration to assure adequate urinary output. The use of urinary alkalinization is controversial but often recommended. Hemodialysis is reserved for cases of acute renal failure not responsive to standard supportive care.
Poster Abstracts

PO-25

B5: A CENTRAL ANTIMUSCARINIC RECEPTOR USED FOR RECREATIONAL ABUSE IN THAI ADOLESCENT

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Objectives: To report a case of “B5” overdose for recreational purpose presenting with symptom of centrally acting antimuscarinic receptor and to report the confirmed evidence that “B5” contained trihexyphenidyl.

Case: A 14-year-old boy was brought to emergency department (ED) due to auditory and visual hallucination with mild agitation. The physical examination revealed heart rate as 72/min, respiratory rate 20/min, and blood pressure 114/50mmHg. Pupils were 4 mm and reactive to light at both eyes. Neurological examination and muscle tone were normal. There was no diaphoresis or dry skin. At ED, 10 mg of diazepam was administered intravenously to control his agitation. He fell asleep after diazepam injection and was transferred to the pediatric ward for observation. Initial blood chemistry revealed normal blood glucose, electrolytes and kidney function. Urine was negative for amphetamines, cannabinoid and opiate. We found a white tablet with the imprint of “B5” in his pocket and it was confirmed by Gas Chromatography/Mass Spectrometry (GC/MS) analysis that the tablet contained trihexyphenidyl.

The patient’s auditory and visual hallucination was gradually improved within one day. He admitted that he and his friends drank cocktail containing 5 tablets of “B5” mixed with iced tea for recreational purpose approximately 18 hours before arrival. He also smoked cigarettes and used cannabis as well as tramadol periodically.

Discussion: Trihexyphenidyl is an antagonist of acetylcholine and other cholinergic stimuli at muscarinic receptors in the central nervous system (CNS) and, to a lesser extent, in smooth muscle. It has weak mydriatic, antisecretory, and positive chonotropic activities. In small dose, trihexyphenidyl has CNS-depressant effects, but in larger doses, it causes CNS-stimulatory effects. Our patient presented with agitation as well as auditory and visual hallucination without significant peripheral anticholinergic effects such as tachycardia, mydriasis, flushing and urinary retention. Therefore, these presentations do support the mechanism of action of trihexyphenidyl. Trihexyphenidyl has been prescribed mainly by psychiatrist and neurologist for treatment of parkinsonian disorder, drug-induced extrapyramidal syndrome and acute dystonia from antidopaminergic drugs. In Thailand, trihexyphenidyl has been available in drug stores without prescription required; therefore adolescents are able to access this drug for recreational purpose easily. They always name trihexyphenidyl as “B5” because of the imprint on the tablet.

Conclusion: “B5” which has been widely abused for recreational purpose among Thai adolescents was proven to be trihexyphenidyl. The clinical presentations of trihexyphenidyl in this report were mainly the effects of CNS antimuscarinic receptor.
2 CASES OF CARDIAC ARREST AFTER INTENTIONAL INGESTION OF ELECTRONIC CIGARETTE LIQUID

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Electronic nicotine delivery system or electronic cigarette (EC) is a device that aerosolized liquid nicotine by heating a solution of nicotine, glycerol and flavoring agents. We present two patients with cardiac arrest resulting from the suicidal ingestion of EC liquid. The intoxication of nicotine from EC liquid reported that have only minor effects. Over 20% of exposure showed no symptoms and common symptoms were vomiting, nausea, ocular irritation and dizziness. In our cases, the intentional ingestion lead to seizures, myocardial dysfunctions and cardiac arrests. One patient exposed to about 23mg/kg and the other patient exposed to about 30mg/kg. As the LD50 for nicotine in human is 1mg/kg, these doses exceeded the lethal dose. In intentional exposures, large amount of EC liquid usually exposed that lead to cardiac arrest. With the increment of EC usage and the absence of the proper regulation for EC liquid, the concerns about the toxic exposure has increased. These cases warn that the ingestion of EC liquid can be one of the emerging method for suicide especially in young adults and adolescents.
INTRODUCTION: Cannabis hyperemesis syndrome (CHS) is unfamiliar in medical practice worldwide. We report a Thai chronic cannabis smoker with delayed CHS diagnosis who received excessive invasive investigations and unnecessary treatments.

CASE REPORT: A 27-year-old Thai man with history of chronic cannabis smoking presented to our hospital with abdominal pain, refractory vomiting, hypokalemia and hypertension 8 years ago. His symptoms were not improved and occasionally got worse so he underwent esophagogastroduodenoscopy (EGD) 3 times despite negative findings. He was diagnosed as irritable bowel syndrome (IBS) for one year but his symptoms were not responsive to standard medications for IBS. Eventually he developed severe colicky abdominal pain, diarrhea and had lost 3 kilograms within a month hence he was admitted. His physical examinations were normal except low body mass index (17.99 kg/m²). Laboratory results demonstrated hypokalemia (2.9 mmol/L), hypochloremia (90 mmol/L), HCO₃ 25 mmol/L, anion gap 20 mmol/L, high urine specific gravity (1.021), ketonuria and proteinuria. Urine toxicology screening was positive for cannabinoid but negative for amphetamine and opiates. He admitted that he had smoked cannabis more intensively for few months and the last usage was 3 days before arrival. He was diagnosed cyclical vomiting syndrome (CVS) and depressive disorder, however the attending physician consulted to our poison center as CHS was suspicious. The patient received intravenous fluid, analgesics and antiemetics. His symptoms were gradually improved and he was discharged on hospital day 9 with oral antiemetics as home medication. He felt better but after he returned home for 3 weeks, his symptoms were relapsed briefly but intensively that required medical attention at out-patient unit. He denied using cannabis and cannabinoid was negative in urine. He completed recovery at 6 weeks and gained weight up to normal body mass index.

DISCUSSION: Our patient’s symptoms were consistent with CHS supported by the temporality and full recovery after cannabis cessation for 6 weeks. The diagnosis was not suspicious hence he underwent unnecessary invasive investigations during the past 8 years. CHS’s diagnosis is done by exclusion. Patients will improve clinically within days after cannabis cessation and symptomatic treatment. Multidisciplinary approach is recommended as long term cannabis cessation is the main objective of treatment.

CONCLUSION: CHS has been described and reported in medical literature, however it is unknown amongst healthcare professionals resulting in delayed diagnosis and management as well as unnecessary invasive investigations.
Poster Abstracts

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A PROSPECTIVE STUDY EVALUATING THE SENSITIVITY AND SPECIFICITY OF TWO DIFFERENT RAPID ORAL FLUID TEST (ROFT) KITS ON COMMON ABUSED DRUGS IN PATIENTS WITH SUBSTANCES ABUSE

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Objectives: To compare the sensitivity, specificity and clinical use of two different brands of rapid oral fluid test (ROFT) on ketamine, cannabis, MDMA, metamphetamine, cocaine & opioid in patients with suspected substances abuse.

Methods: This is a single-centered prospective cohort study of diagnostic test. Patients suspected to have drug abuse were tested using two commercially available rapid oral fluid tests (ROFTs)- Securetec DrugWipe 5S (kit 1) and SalivaScreen (kit 2). The sensitivity, specificity and accuracy of both tests were calculated using the laboratory urine toxicology screening results as the reference standard.

Results: Securetec DrugWipe 5S (kit 1) and SalivaScreen (kit 2) have comparable results in terms of sensitivity, specificity and accuracy. SalivaScreen (kit 2) has additional entities of MDMA and opioid. However, SalivaScreen (kit 2) needed more oral fluid, thus more time (in terms of minutes vs seconds) and difficulty in collecting sufficient amount of oral fluid for the test. The failure rate of using SalivaScreen (kit 2), 27.3%, is higher than that of Securetec DrugWipe 5S (kit 1), 1.7%. Although the sensitivity of both ROFTs varied in different types of drug of abuse, they have 91%-100% specificity and 82-100% accuracy, which are comparable to that of bedside urine immunoassay test. ROFT can potentially be employed as an alternative investigation for rapid diagnosis of patients with suspected drug abuse.

Conclusion: Securetec DrugWipe 5S (kit 1) and SalivaScreen (kit 2) have good and comparable results of sensitivity, specificity and accuracy in detecting recent abusive drug exposure. However, the use of Securetec DrugWipe 5S (kit 1) was more practicable and feasible.
DEATH FROM N-ACETYLCYSTEINE FOLLOWING ACETAMINOPHEN POISONING, A CASE REPORT

Zohreh oghabian

Objective: Acetaminophen is an over the counter drug so it can be used for suicidal attempt especially among adolescents. There are four main clinical stages following Acetaminophen overdose. The lowest dose that can cause acute toxicity is more than 150mg/kg in children and more than 7.5gr in adults. The best diagnostic test is evaluation of serum Acetaminophen level 4 hours after ingestion.

Method: A 14 year old girl admitted to emergency department 10 hours after suicidal ingestion of 20 Acetaminophen (total dose of 6.5gr), 10 Ibuprofen and 10 Metformin tablets, with a history of mild asthma, complaining nausea, vomiting, dizziness and confusion. The initial vital signs were normal. Serum Acetaminophen concentration was not available and because of unreliable history the patient underwent N-Acetylcysteine (NAC) 150mg/kg in 200 ml D5W intravenously for 1 hour as loading dose. During NAC consumption the patient showed angioedema, hypotension and anaphylactic reaction, and so NAC infusion discontinued. Epinephrine, hydrocortisone, chlorpheniramine and other conservative therapy applied. Unfortunately despite of appropriate treatment the patient died 19 hours after admission.

Conclusion: Anaphylactoid reaction including nausea, vomiting and cutaneous reactions may occur in up to %18 of patient who received IV NAC. In 1% cases it may be sever and cause hypotension, bronchospasm, angioedema and death. Anaphylactoid reactions are more common in patients with lower serum Acetaminophen concentration.
RAPID DRUG SCREENING FOR USE IN EMERGENCY MEDICAL TREATMENT

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Objectives: We addressed the development of a new reliable drug screening method which completes within 10 min using a combination of the modified QuEChERS (Quick, Easy, Cheap, Effective, Rugged, Safe) method and an FI-MS/MS (Flow injection -tandem mass spectrometry).

Methods: Whole blood samples were collected from practical forensic cases (N=120) and pretreated using the QuEChERS method. Briefly, 0.5 mL of whole blood was diluted 3-fold with distilled water. The diluted sample was placed in a plastic tube with 0.5 g of the pre-packed extraction kit reagent, a stainless steel bead, and 1 mL of acetonitrile. The mixture was shaken for 30 s and centrifuged for 1 min. The supernatant was transferred to a 2.0 mL centrifuge tube containing the solid-phase extraction sorbent for sample cleanup. The tube was mixed for 10 s and centrifuged for 1 min. The extract was analyzed by both LC-MS/MS and FI-MS/MS (analysis time = 1.5 min). All product ion spectra obtained by FI-MS/MS were automatically processed by Library View software, and the results were compared with those of the LC-MS/MS analysis using Dice’s coefficient.

Results: The modified QuEChERS method took about 5 min for extraction and FI-MS/MS analysis needed only 1.5 min per sample (No column equilibration required). Therefore, a sequence of analytical procedures, from the pretreatment of whole blood to the reporting of results can be completed within 10 min. For actual forensic cases (N=120), the qualitative results roughly matched (96% concordance rate) with the results obtained with the standard LC-MS/MS technique.

Conclusion: The combination of QuEChERS and FI-MS/MS enabled us to complete the entire drug screening process, from the start-up of the instruments through the extraction process and data analysis, within 10 min.
ALCOHOL INTOXICATION IN SANGLAH HOSPITAL, BALI- INDONESIA

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Objectives: This study was conducted to evaluate the characteristic of Alcohol intoxication patients and correlation between type of intoxication (ethanol and methanol) with clinical manifestation and clinical manifestation with mortality in Sanglah Hospital a tertiary referral hospital in Bali.

Method: Cross sectional study. Data were obtained from medical record patients in 2013-2015. Information was extracted and statistic analysis were performed with descriptive to evaluate characteristic of intoxication patients, and Spearman test to find correlation between type of intoxication (ethanol and methanol) with clinical manifestation and clinical features with mortality.

Results: Over the three years period there is 51 (16.1%) alcohol intoxication patients from total of 304 Intoxication patients enrolled, with Ethanol intoxication 39 (76.5%) and methanol intoxication 12(23.5%). Male 42 (82.4%), with mean ages 28 years old. Mean length of stay 2 days with ranges 1 to 8 days. Six patients (11.8%) with decrease of consciousness while 45 patients (88.2%) with other clinical manifestation (i.e gastrointestinal disturbance, blurred vision, etc). Four patients (7.8%) have passed away due to severe metabolic acidosis cause by methanol intoxication while no mortality cause by ethanol intoxication. There is significant correlation between type of intoxication with clinical features (r=0.371; p= 0.007) and clinical feature with mortality (r=0.799; p= 0.000).

Conclusions: Result of this evaluation indicate there is correlation between type of intoxication with clinical features and clinical feature with mortality.

Keyword: Alcohol intoxication, clinical features, mortality
Poster Abstracts

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THE TREATMENT OF NEP1-40 TO THE RATS BRAIN DAMAGES AFTER ACUTE CARBON MONOXIDE POISONING

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Objectives: To evaluate the treatment of NEP1-40 to the rats brain damages after acute carbon monoxide poisoning. Regeneration of neural cells is a critical process for repairing the damaged brain after acute carbon monoxide poisoning. Nogo has been identified as an inhibitor of neurite outgrowth that is specific to the brain. In this study, the Nogo-A receptor (NgR) antagonist NEP1-40 was used to study the effects of inhibition of NgR on the regeneration of neural cells.

Methods: Rats were assigned into 4 groups with 10 rats randomly. As follow: normal group, in which rats received no CO poisoning and no reatment; model group, in which rats received CO poisoning and no treatment; medium group, in which rats received CO poisoning and Sodium chloride injection (for 3 days); NEP1-40 group, in which rats received CO poisoning and NEP1-40 injection (for 3 days). Histopathological studies: Hematoxylin and eosin (HE) stain and Nissl stain is used to measure the histopathology. Immunofluorescence staining is used to measure the expression of synapsin I and GAP-43. Western Blotting is used to measure apoptosis related indicators, such as Bcl-2, Bax, c-PARP. TUNEL Staining and Caspase-3 assay is also used to measure apoptosis.

Results: After NEP1-40 was injected into the CO poisoned rats, the neurological deficits can be improved. And the positive areas of GAP-43 were increased after NEP1-40 injection.

Conclusion: NEP1-40 is beneficial for axon reconstructing in CO poisoned brain. And it can also improve the capability of antioxidant in the CO poisoned brain. In the meanwhile, NEP1-40 injection inhibit the apoptosis in the brain.
Poster Abstracts

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TOLL-LIKE RECEPTOR 9 MEDIATES PARAQUAT-INDUCED ACUTE LUNG INJURY: AN IN VITRO AND IN VIVO STUDY

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Objectives This study aimed to investigate the role of Toll-like receptor 9 in paraquat-induced acute lung injury (ALI).

Methods C57BL mice were randomly assigned into the control group, paraquat group, paraquat + antagonist (ODN2088) group, and antagonist (ODN2088) group (n=24 per group). After paraquat 30mg/kg ip for 2, 24 and 48 h, serum samples and lung tissues were collected. A549 cells were randomly divided into the control group, paraquat group, paraquat + TLR9 siRNA group, and TLR9 siRNA group. After paraquat treatment for 24 h, the cells and supernatant were collected. TNF-α and IL-1β levels were detected by ELISA. The extent of lung injury was determined following H&E staining. TLR9, TNF-α and IL-1β mRNA expression in the cell lysis solution was measured by PCR. Immunofluorescence staining was performed to detect the distribution of TLR9 and p-p65 in A549 cells, and TLR9, MyD88, p-IRAK4 and p-p65 levels were analyzed by Western blotting.

Results The in vivo result shows that the TLR9, MyD88, p-IRAK4 and p-p65 protein levels, and cytokines TNF-α and IL-1β levels in paraquat group were significantly higher than that in the control group; TLR9 blocker odn2088 pretreatment attenuated lung edema, inhibited the MyD88 and NF-κB activation, and reduced TNF-α and IL-1β in serum. In the in vitro experiments, the gene silencing of TLR9 reduced the mRNA expression of TLR9, TNF-α and IL-1, inhibited the NF-κB activation, attenuated the cell apoptosis.

Conclusion TLR9 mediates paraquat-induced ALI, antagonizing or silencing TLR9 may attenuate paraquat-induced ALI and reduce the production of pro-inflammatory cytokines.
Poster Abstracts

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EXPRESSION OF FRACTALKINE IN ACUTE LUNG INJURY INDUCED BY PARAQUAT IN RATS

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Objective: Observe the expression of fractalkine (FKN or CX3CL1) in serum and lung tissue in early phases after paraquat (PQ) poisoning in rats. Analyze the effect of FKN on acute lung injury induced by PQ.

Methods: A total of 66 SD rats were divided into two groups in random, namely PQ group (n=36) and control group (n=30). By intra-peritoneal route, PQ (22 mg/kg) was administered to PQ group, and normal saline to control group. Rats were separately sacrificed at 6 h, 12 h, 24 h, 72 h and 120 h after poisoning. Lung coefficient was determined. The levels of FKN in serum and lung tissue homogenate were detected by ELISA. Lung pathological changes were observed by HE staining. FKN changes were investigated by immunohistochemistry staining. Data was analyzed by SPSS19.0.

Results: From 6 h to 120 h after poisoning, parameter determined in PQ group had great changes, compared with the control group. At 6 h, 12 h, 24 h, 72 h and 120 h, lung coefficients were respectively 5.03±0.07, 5.17±0.10, 5.46±0.10, 5.68±0.15 and 5.83±0.11 in PQ group, significantly higher than those(4.49±0.20, 4.28±0.13, 4.45±0.17, 4.31±0.19 and 4.31±0.16) in control group (P<0.01). Levels of FKN in serum were respectively 140.9±15.8 pg/ml, 157.9±17.6 pg/ml, 188.8±24.8 pg/ml, 224.4±18.1 pg/ml and 229.9±10.0 pg/ml, significantly higher than those(121.7±12.8 pg/ml, 121.6±12.1 pg/ml, 118.3±14.0 pg/ml, 122.8±12.4 pg/ml and 120.5±8.8 pg/ml) in control group (P<0.01). Levels of FKN in lung tissue homogenate were respectively 4222.0±641.1 pg/ml, 5021.0±514.5 pg/ml, 5911.6±478.1 pg/ml, 7092.2±652.9 pg/ml and 7639.3±666.6 pg/ml, significantly higher than those(2860.2±477.3 pg/ml, 3068.9±446.0 pg/ml, 3168.7±728.5 pg/ml, 3178.0±488.2 pg/ml and 3147.3±426.6 pg/ml) in control group (P<0.01). In PQ group, pathological changes were acute lung injury manifested itself in inflammatory cell infiltration, congestion, edema, structural damage, et al. The lung injury aggravated gradually from 6 h to 120 h. In control group, there was no significant change. FKN expressed mainly in bronchial cells, alveolar epithelial cells and pulmonary artery endothelial cells. Where there was more expression of FKN, there were more inflammatory cells. The level of FKN in lung tissue homogenate was positively correlated with lung coefficient(r=0.937). The level of FKN in serum was positively related to that in lung tissue homogenate(r=0.968).

Conclusion: There is correlation between FKN and acute lung injury induced by PQ in rats.

(Keywords) Paraquat; poisoning; fractalkine; lung injury; rat
**Poster Abstracts**

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**PROTECTIVE EFFECT OF THE RECOMBINANT HUMAN K192 SUBTYPE OF PARAOXONASE 1 ON CHLORPYRIFOS-INDUCED ACUTE LIVER INJURY IN SD RATS**

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**Objective:** To investigate the protective effect of recombinant human K192 subtype of paraoxonase 1 (rHuPON1K192) on acute chlorpyrifos poisoning induced liver injury in rats.

**Methods:** Totally 50 healthy adult SD rats were randomly assigned into five equal groups, including normal group (group A), rHuPON1K192 control group (group B), chlorpyrifos group (group C), low dose rHuPON1K192 pretreated group (group D), and high dose rHuPON1K192 pretreated group (group E). Group C, D and E were given intragastric administration of chlorpyrifos. Group D was given rHuPON1K192 by caudal intravenous injection according to 4 500 U/kg 30 min before intragastric administration of chlorpyrifos. Group E was given rHuPON1K192 according to 9 000 U/kg. Group A received same volume of saline by intragastric administration. Group B was only given rHu- PON1K192 by caudal intravenous injection. After 8 hours, the rats were anesthetized and the blood was harvested. The activity of alanine aminotransferase (ALT) and glutamic-oxalacetic transaminase (AST) was detected by rate method, and the activity of malic dehydrogenase (MDH) and glutamate dehydrogenase (GLDH) was determined by ELISA method. The expression of hypoxia inducible factor-1α (HIF-1α) in liver tissue was detected by immunohistochemical method. The liver tissue was examined by light microscope and transmission electron microscope (TEM). Finally the differences among the groups were compared.

**Results:** There was no significant difference between group A and group B (P > 0.05). Compared with group A, the liver function indexes of ALT, AST, GLDH and MDH exhibited significant increase in group C, a higher expression of HIF-1α was also observed, and the pathological observation showed severe damage of cell membrane and mitochondrion (P < 0.01). The above indexes in group D and group E were slightly elevated compared with group A, the change in group E was smaller than that of group D. There was no significant difference between the two groups (P > 0.05). The above indexes change in group D and group E were lighter than those in group C (P < 0.05).

**Conclusion:** rHuPON1K192 has a protective effect on liver injury induced by chlorpyrifos poisoning.

**Keywords** SD rat; chlorpyrifos; rHuPON1K192; liver injury
PROTECTIVE EFFECT OF RECOMBINANT HUMAN PARAOXONASE K192 ON LUNG INJURY INDUCED BY CHLORPYRIFOS POISONING

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[Abstract]

Objective To explore if the (rHuPON1 K192) can protect acute lung injury in Sprague-Dalwey (SD) rats induced by chlorpyrifos (CPF) poisoning.

Methods 30 healthy male adult SD rats were randomly divided into normal control group (Group A), the pretreatment Group (Group B), the infected Group (Group C), 10 rats in each group. The rats in Group C were given chlorpyrifos by gavage 330 mg/kg (2LD50) to establish organophosphate poisoning model, group A accepted normal saline and group B caudal intravenously rHuPON1K192 (9000U/kg) 30 minutes ahead of exposure by pretreatment. 8 hours later, blood and lung tissue samples were collected for testing. Determination of serum levels of nuclear factor-Kappa B (NF-kB), Super Oxide Dismutase (SOD), malonaldehyde (MDA) and pulmonary coefficient to observe the changes of the lung histopathology and electron microscopy.

Results Group B compared with Group C, SOD activity increase and MDA content increase in serum, NF-kB activity of lung tissue decrease. Lung tissue of Group A appeared normal under light microscope and electron microscope. While in Group C the lung tissue appeared heavier degree of neutrophil infiltration, lung edema, alveolar septal thickening, erythrocyte aggregation in the alveolar under light microscope, swelling, bubbling, cracking of the cytoplasm of the epithelial cells, chromatin coagulation and fragmentation under electron microscopy. The above changes of rats is lighter in Group B. Conclusion rHuPON1 K192 can relieve lung injury from acute chlorpyrifos poisoning, play a protective role in lung injury.

Key Words: organophosphate poisoning, chlorpyrifos, recombinant human paraoxonase, acute lung injury, NF-kB
OVEREXPRESSION OF TOLLIP PROVIDES A PROTECTIVE EFFECT ON PARAQUAT-INDUCED ACUTE LUNG INJURY

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Objectives: Toll-interacting protein (Tollip) is an important negative regulatory factor in TLRs/IL-1 R signal transduction pathway, which play an important role in the negative regulation of the inflammatory response. This study was designed to up-regulating Tollip expression by constructing gene recombinant adenoviral vector that carries Tollip gene of mice ,and to investigate the protective effect on paraquat-induced acute lung injury.

Methods: Forty-two SPF C57BL/6J mice, 8-12 weeks old, weighing 20 to 25 g, unlimited male and female, were randomly divided into seven groups(n=6 each): control group, PQ24h group,PQ72h group, PQ + Ad.V24h group, PQ + Ad.V72h group, PQ + Ad.mTollip24h group, PQ + Ad.mTollip72h group. 5×10⁸ PFU of Ad.mTollip (Ad.mTollip group) or Ad.V (Ad.V group) was injected intratracheally to establish mice Ad.mTollip infection model . Forty-eight hours after intratracheal administration of viruses, mice were injected intraperitoneally with 28 mg/kg PQ to establish acute lung injury model. The mice were sacrificed at 24 and 72 h after PQ challenge. Expression of Tollip in the lungs of mice was observed by using immunohistochemical staining, RT-PCR and Western blots; mice pulmonary histological changes were observed by HE staining and were scored by histopathologic grading; activity of myeloperoxidase was detected; NF-κB transcriptional activity in lungs was detected by EMSA; the level of IL-1β in serum and lung tissue homogenate was detected by ELISA.

Results: Through the immunohistochemistry, Real-time PCR and Western blot, we observed that expression of Tollip decreased and lower than the normal control group in PQ group and PQ+Ad.V group, but expression of Tollip was enhanced obviously (P <0.05) in PQ+Ad.mTollip group compared with those in PQ group and PQ+Ad.V group; and after Ad.mTollip transfection, lung tissue injury in mice reduced, the activity of MPO and NF-κB decreased, the content of IL-1β in serum and lung tissue homogenate decreased in PQ+Ad.mTollip group compared with those in PQ group and PQ+Ad.V group.

Conclusion: Enhancement of Tollip expression in the lungs can reduce inflammation and pulmonary pathological damage in PQ-induced acute lung injury ,and provides a protective effect on PQ-induced ALI in mice.
DIPHOTERINE® EYE/SKIN CHEMICAL SPLASH DECONTAMINATION SOLUTION: A REVIEW OF SAFETY AND EFFICACY DATA ACCUMULATED OVER THE PAST 14 YEARS

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Approximately 2-10% of all burns are chemical burns, due to the action of corrosive or irritant substances on skin or eyes. Safety and efficacy of Diphoterine®, an amphoteric, polyvalent, chelating eye/skin decontamination solution were published in the early 2000s in French and English. Since that time, in vitro, in vivo and clinical studies have been published or presented which support this solution as being safe and superior to tap water, normal saline, or buffered solutions for chemical splash rinsing. Diphoterine® has 6 binding sites (for acids, bases, oxidizers, reducing substances, alkylating agents, solvents, etc.), is non-toxic, not significantly absorbed through intact or injured tissue surfaces, non-sensitizing, and has been shown to be more efficacious than water rinsing.

According to data courtesy of Alcoa, Inc. and the United Steel Workers Union, where Diphoterine is available (Europe, Jamaica, Latin America, Western Australia), chemical burn severity rates vary from 0.00-0.16, whereas in the USA where Diphoterine is not available, the rate is 0.72. On the surface and from the interior of exposed tissues, studies have shown: efficacy against nearly all types of irritant/corrosive chemicals; non-toxic, non-irritating, non-sensitizing; clinical interest for both emergent and delayed rinsing. In animals, it has polyvalence and superior efficacy as compared to alternative buffered eyewash solutions with which deleterious effects including corneal calcifications have been reported. In rat studies of concentrated hydrochloric acid dermal exposure, it was more efficacious than normal saline for arresting the acid’s action on the skin and markers of pain and inflammation were significantly reduced.

Similar results were found in rabbits exposed to sulfuric acid and sodium hydroxide. With chemical splashes, immediate workplace utilization allows optimal decontamination. In comparison with water or buffered solutions, Diphoterine has shown a lack of sequela, decreased need for secondary care, and lesser or absent lost worktime. Delayed utilization by healthcare professionals has also been efficacious. After the burning action is arrested, further treatment can be done under optimal conditions. As Diphoterine rapidly normalizes corneal or skin pH to the tolerable physiological range (5.5-9.0), pain is decreased, re-epithelialization time improved, and complication risks decreased.
Poster Abstracts

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IS DELAYED DECONTAMINATION WITH DIPHOTERINE® SOLUTION USEFUL IN CHEMICAL INJURIES?

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Objectives: show the usefulness of delayed decontamination with Diphoterine® solution after a chemical insult.

Methods: in a retrospective study of patients admitted to the Liege Burn Centre, Belgium, among half of the patients with chemical injury suffered from a domestic accident. They had no decontamination with Diphoterine® solution, only in a few cases with water. In some cases concerning industrial accident, there was no decontamination on site at time of accident. At the hospital, we performed a delayed decontamination with Diphoterine® solution, sometimes several hours after the injury.

Results: we present a lot of good delayed decontamination results using Diphoterine® solution regarding domestic accidents as well as occupational accidents. Some cases concern children thus allowing us to claim the innocuousness of Diphoterine® solution.

Conclusion: a delayed washing is indicated, but the results of course will not be as good as in an immediate decontamination. This being said, we have nevertheless, observed better results with Diphoterine® solution than with those washed with water only.
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OCCUPATIONAL CHEMICAL BURNS IN THE EMERGENCY DEPARTMENT

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Objectives: Chemical burns caused by exposure to acid, alkali, or organic compounds mostly occur in workplaces. However, the characteristics of occupational chemical burns were rarely reported. We conducted a study to investigate the characteristics of occupational chemical burns in the emergency department.

Methods: We identified burned patients visiting the emergency department of a medical center between January 1, 2014 and December 31, 2014. Patients with the diagnosis of occupational chemical burns were enrolled. By reviewing the medical records, we collected the epidemiologic characteristics, including age, sex, and occupation. We also recorded the kind of chemical substance, the anatomical site, the body surface involved, and the depth of the burn. The operations, hospitalizations and mortality due to burns were also reported.

Results: A total of 90 cases of occupational chemical burns were identified (21% of the burned patients). The mean age was 34.4 years, and 82.2% were male. With regard to the kind of chemical substances, most were acids (45.3%), followed by alkali (32%) and organic compounds (14.7%). Eye was the most commonly injured body part (54.4%), followed by the upper extremities (31.1%). Manufacturing was the most common industry, accounting for 89.7% of occupational chemical burns. The involved body surface areas of the burn were less than 5% in all patients. Most patients were treated and released (89%). None of the patients received operations. No mortality was identified.

Conclusion: Occupational chemical burn is an important issue in workplaces. The young and male were vulnerable to occupational chemical burns, with eye as the most frequently injured body part. These findings may serve as important references in formulating preventive strategies for occupational chemical burns in Taiwan.
RELATIONSHIP BETWEEN OXYGEN SATURATION, OXYGEN SATURATION GAP AND METHEMOGLOBIN LEVEL IN METHEMOGLOBINEMIA PATIENTS

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Objectives: Co-oximeter is still not available in most of the hospitals in Thailand. Currently oxygen saturation and oxygen saturation gap are used for diagnosis and severity assessment of methemoglobinemia. Our study aims to determine correlation between Methemoglobin (MHb) level with oxygen saturation, and oxygen saturation gap.

Methods: This is a retrospective review of laboratory results from all methemoglobinemia cases, identified by laboratory result of MHb level more than 1%. The data sets without record of oxygen saturation, and arterial blood gas result were excluded. Percentage MHb level (%) and absolute MHb level (g/dL) were analyzed for correlation with oxygen saturation, oxygen saturation gap, hemoglobin level, pCO2, and paO2, using Pearson’s correlation analysis. The variables significantly correlated with percentage MHb level (%) and absolute MHb level (g/dL) were indicated for multiple regression analysis.

Results: Total of 42 data sets, from 25 methemoglobinemia cases, were analyzed. The median percentage MHb level was 6.9 % (interquartile range 3.0%-10.1%). The median absolute MHb level was 0.67 g/dL (interquartile range 0.37, 0.98). The median of oxygen saturation gap was 7 % (interquartile range 4, 10). The median of oxygen saturation was 90 % (interquartile range 88, 94). In univariate analysis, oxygen saturation and oxygen saturation gap were correlated with percentage MHb level. Oxygen saturation and oxygen saturation gap were correlated with absolute MHb level. In multivariate analysis, only oxygen saturation were correlated with percentage MHb level and absolute MHb level. The correlation between oxygen saturation and percentage MHb level was in the equation of percent MHb level = 77.48 – (0.77 * oxygen saturation); Adjusted R² = 0.27, p <0.01. The correlation between oxygen saturation and absolute MHb level was in the equation of absolute MHb level = 7.16 – (0.07 * oxygen saturation); Adjusted R² = 0.27, p <0.01.

Conclusions: In methemoglobinemia patients, the oxygen saturation and oxygen saturation gap have correlation with MHb level in univariate analysis. But only the oxygen saturation has correlation with MHb level in multivariate analysis.
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SLEEPING BEAUTY USING EUCALYPTUS OIL

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Objectives: Eucalyptus oil is an essential oil which can cause fatality in children and adults. The amount reported in the literature vary from 10-250 ml and fatal dose was reported at 200-250 ml with coma, seizures or aspiration pneumonitis. We report a case of massive eucalyptus oil ingestion and describe its clinical course.

Methods: We report a case of massive eucalyptus oil poisoning with prolonged coma.

Results: A 34-year-old lady was brought into the Emergency Department with a history of being found unconscious on the bathroom floor with 5 empty bottles of eucalyptus oil (200 mlx5=1L) (day 0). Paramedics gave 1600 µg naloxone with little effect. She has an initial GCS 3, was maintaining airway and hypotensive with HR 97/min, BP 85/50 mmHg, temperature 34°C, RR 25/min and saturating at 100%. She was intubated and ventilated and no corrosive injury was noted in her airway. Physical examination revealed crepitation in right lung base. Her hypotension was managed with intravenous fluid and metaraminol followed by low dose adrenaline infusion. She was also treated with activated charcoal via a nasogastric tube and proton pump inhibitor infusion. EEG performed on day 1 and 5 showed no epileptiform activity. She had watery diarrhea with Eucalyptus odour from day 1 onwards and was managed with a rectal flexiseal tube to prevent soiling. Upper gastroscopy performed on day 2 showed no evidence of gastric mucosal damage. CT brain performed on day 3 was normal. Her lactate was high in the first 48 hours and peaked at 8.2 mmol/L. She has a prolonged coma which lasted 7 days and required no sedation. On day 4 she opened her eyes intermittently with normal reflexes in the upper limb but was hyperreflexic with clonus in the lower limbs. Her brain stem reflexes were preserved. She was extubated on day 9 but has to be re-intubated for agitation and increased sputum production until day 13. She maintained normal renal and liver function. Her other complications include normochromic normocytic anaemia, haemoglobin dropped from 11 to 6.6 g/L by day 11 requiring blood transfusion. There was no evidence of intravascular haemolysis and she was menstruating at the time. As she recuperated from the event, she explained that this was a pre-meditated plan and she purchased the eucalyptus oil solely for the purpose of suicide.

Conclusion: This is the largest volume of eucalyptus oil poisoning ever reported and patient survived with good supportive care.
A CASE OF RAPID RESPIRATORY FAILURE AND TRANSIENT HYPERTENSION AFTER BITE BY BUNGARUS MULTICINCTUS

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Background: Envenomation by snake is common in Taiwan during summer time. There are six common species of venomous snakes in Taiwan, including three kinds of hemotoxic snakes, two kinds of neurotoxic snakes and one mixed type. Bungarus multicinctus (Taiwanese krait) is one of the neurotoxic snakes which may lead to respiratory failure and death due to its bungarotoxin. We describe the clinical presentation that a women experience respiratory failure, transient hypertension and cranial nerve neuropathy after Bungarus multicinctus bite.

Case presentation: This 61 years old woman lives in the suburbs of Taichung, in the middle of Taiwan. In a summer morning, she went to a ditch for washing something. Then she felt right ring finger pain after bitten by a snake with black and white stripes. Although the pain subsided soon, she felt nausea, dizziness, numbness over her lip and unsteady gait after getting home ten minutes later. She was sent to our emergency department within one hour. Two vials of antivenom to neurotoxic snakes were given due to progressive symptoms to general paralysis, ptosis and diplopia. Respiratory distress developed about 1.5 hour after visiting ER. Endotracheal tube was inserted with mechanical ventilation. She was then admitted to intensive care unit. Another two vials of antivenom was given after 6 hours later and the second day of admission. Spontaneous breathing was noted on the second day. She felt whole body pain, diplopia, ptosis and weakness for the first five days, but she got improving gradually. Transient hypertension and diffuse T wave inversion were found in EKG monitor. No chest pain was told. Cardiac ultrasonography revealed diffuse hypokinesia. Hypertension was improved on the fourth day and she got extubated on the fifth day of admission. Rehabilitation program was arranged and she was discharged on day 14 and could walk by herself.

Conclusion: Bungarus multicinctus is one of the neurotoxic snakes in Taiwan. After antivenom use, the patients seldom experience respiratory failure in these years. We describe a case of respiratory failure after Taiwanese krait bites and found transient hypertension in this patient. The bungarotoxin may play a role in cardiovascular effect due to its reaction on acetylcholine acceptor in sympathetic and parasympathetic neuron.
Objectives: Averrhoa bilimbi, commonly known as ‘bilimbi’, belongs to family Oxalidiaceae. Bilimbi is a small tree up to 15 meters high. Fruits are fairly cylindrical with five broad rounded longitudinal lobes, and produced in clusters. The fruits are very sour. The fruits can be eaten fresh or processed as dried fruits. Oxalic acid concentrations in bilimbi ranged between 8.57 and 10.32 mg/g. We report a case of acute kidney injury due to drinking bilimbi juice.

Methods: We report clinical data and outcome of a single case.

Results: A 57-year-old female regularly drinks fruit and vegetable juice. Seventeen days before presentation, she blended approximately 100 home-grown bilimbi fruits for 1000 mL of juice. She drank about 350 ml of juice, while her sister took approximately 200 ml. She developed severe nausea thirty minutes later, which followed by vomiting, watery diarrhea, flank pain and loss of appetite. She presented at the hospital on day 4 due to persistent nausea and flank pain. Physical assessment revealed normal vital signs and hyperactive bowel sounds. Her initial serum creatinine was 1.94 mg/dL (baseline 0.56 mg/dl). Twenty four-hour urine oxalate concentration was 0.28 mg/dl. After treatment with ondansetron and intravenous crystalloid hydration, her symptoms gradually improved. She was admitted for 5 day with serum creatinine 1.45 mg/dL before discharge. Her follow-up serum creatinine concentrations were 0.92, 0.85 and 0.72 mg/dL on days 23, 37 and 60, respectively. Her sister experienced nausea and vomiting, which did not require hospitalization. She had an insignificant elevation in serum creatinine.

Conclusion: We report a case of acute kidney injury due to ‘Averrhoa Bilimbi’ fruit juice consumption. Early symptoms were nausea and vomiting. Postulated mechanism of illness is the deposition of oxalate in kidney. The mainstay of treatment is supportive care. Consumers and venders of fruit juice should realize that ‘Averrhoa Bilimbi’ fruit juice can cause acute intoxication.
Poster Abstracts

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MISTAKING FOXGLOVE FOR COMFREY RESULTED IN FATAL POISONING

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Objectives: Foxglove (Digitalis purpurea) contained several cardiac glycosides (CG), which may cause cardiac toxicity following ingestion. Few human poisonings from mistaking foxglove leaves for comfrey were reported, and all these cases recovered. We report a case who mistakenly took foxglove misidentified as comfrey, developed refractory ventricular dysrhythmia and eventually expired.

Methods: A 55-year-old woman presented to ED with nausea, vomiting, malaise and lightheadedness eight hours after drinking alleged “comfrey” herbal tea. On arrival, her mental status was normal and her vital signs were stable except a slow heart rate of 54 bpm. Physical examination was unremarkable. Laboratory studies showed a notable hyperkalemia of 7.6 mEq/L, otherwise the remainders were normal. Electrocardiography revealed a first degree atioventricular block with paroxysmal junctional beats. Conventional therapy for hyperkalemia with intravenous calcium gluconate, insulin, dextrose, and sodium bicarbonate were administered.

She developed progressive bradycardia and hypotension, which needed fluid resuscitation, dopamine infusion and transcutaneous pacing. 3 hours after arrival, a follow-up electrocardiography showed wide QRS complexes with paroxysmal ventricular tachycardia. Emergent hemodialysis was performed for her hyperkalemia and ventricular dysrhythmia.

Results: Based on the cardiac toxicity concomitant with hyperkalemia, mistakenly ingestion of a CG-contained plant was highly suspected. A serum digoxin level was checked and reported as 151.2 ng/mL. Hemodialysis was terminated immediately and 2 vials of Digibind were given (stock in our hospital: 2 vials). Just before Digibind infusion, the patient collapsed with a rhythm of polymorphic ventricular tachycardia followed by ventricular fibrillation. CPR was started and emergent extracorporeal membrane oxygen (ECMO) was set up because of the refractory ventricular dysrhythmia. She was admitted to ICU where 8 vials of Digibind were given subsequently. Unfortunately, the patient developed lower limbs ischemia and multiple organ failure, and finally expired on hospital day seven. A sample of the alleged “comfrey” from her husband was identified as foxglove (digitalis purpurea) by a botanist.

Conclusions: Accidental foxglove poisoning may occur because comfrey leaves resemble those of foxglove when not in bloom. Timely diagnosis can be difficult while lack of accurate exposure history. GI symptoms, followed by cardiac toxicity and hyperkalemia could be the only hints for diagnosis. Although digoxin-specific antibody fragments (DSFab) have variable efficacy for natural CG poisonings, it is usually recommended to administer 10 vials empirically in life-threatening poisoning. When DSFab is either insufficient or unavailable, early ECMO intervention for patients with unstable hemodynamics or life-threatening dysrhythmia is reasonable, although the evidence is insufficient.
Histamine Production in Preserved Silkworm Pupae

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Objectives: Silkworm pupae are by-products from silk production and are commonly consumed in silk-producing countries throughout East and Southeast Asia. Silkworm pupae have been reported to cause two outbreaks of histamine poisoning in Thailand. We investigate whether histamine is found naturally in silkworm pupae or histamine is produced during preservation of the pupae.

Methods: We euthanatized 120 live silkworm pupae (NangLai; J108x strain) and extracted them from the cocoons. Ten pupae were used in each of the 12 treatment groups. The 12 treatments consisted of 4 time lengths of tampering (0, 24, 48 and 72 hours) and 3 tampering temperatures (-20°C, 10°C and 25°C). Histamine concentrations in the extracts from the treatments were measured using competitive direct enzyme-linked immunosorbent assay (CD-ELISA, Neogen® Histamine Test Kit).

Results: The mean (standard deviations) mass of the silkworm pupae was 1.005(0.07) g. The average concentration of histamine concentration immediately post-euthanasia was 12.45 ng/g. Histamine concentrations at 72 hours for the -20°C, 10°C and 25°C groups were 12.7, 22.3 and 69.7 ng/g, respectively.

Conclusion: Silkworm pupae contain negligible amounts of histamine. However, histamine productions happen during preservation of silkworm pupae at chilling and room temperature.
ADRENAL INSUFFICIENCY AND OVERWHELMING SEPSIS FROM CHRONIC INTAKE OF ADULTERATED HERBAL COFFEE SEHAT BADAN®

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Introduction: The Indonesian herbal coffee Sehat Badan® (literally translated as “healthy body”) has been widely used as panacea for all inflammatory condition. Anecdotal reports noted rising cases of cushingoid features after intake [1]; moreover, the Philippine Food and Drug Administration (FDA), banned its use due to improper labeling and adulteration of arsenic, mercury, diclofenac, paracetamol, ibuprofen [2] and recently, dexamethasone [3].

Case Presentation: A 63 year old male with gouty arthritis, on frequent Sehat Badan® intake (>3x/ day), was seen at the Emergency Department for fever, decreased sensorium, severe respiratory distress, hypotension, tachycardia with generalized body weakness. Manifestations appeared after patient stopped taking Sehat Badan® in preparation for an elective eye surgery. He was diagnosed as a case of Methicillin-resistant Staphylococcus aureus (MRSA) pneumonia and complicated urinary tract infection with Acute Kidney Injury and relative Adrenal Insufficiency. He was intubated, started on fluids, inotropes and managed with Vancomycin and Meropenem. He was given Hydrocortisone because of persistent hypotension. Blood pressure improved after 2 days of hydrocortisone use. Emergency hemodialysis (10 sessions) was done. Arthocentesis revealed fungal arthritis and was started on Fluconazole. He was sent home after 10 days of hospitalization with regular out-patient follow-up.

Discussion: This case presents adverse effects of prolonged Sehat Badan® use which was apparent after withdrawal. Recent tests done by FDA confirmed the adulteration of dexamethasone in its preparation [3]. The presence of corticosteroids in the product taken by patient was not documented. However, the overwhelming infection (fungal arthritis and MRSA pneumonia) indicated degree of immunosuppression possibly from chronic corticosteroid intake. The adrenal insufficiency also supported the probability of steroids in the product. On the basis of available evidence, irrespective of the results of adrenal testing, hydrocortisone should be given soon after the onset of septic shock in patients who remain hypotensive despite adequate administration of fluids and vasopressor agents [4]. This case underscores the importance of taking a careful medical history, with special interest on the use of regular and alternative (herbal) drugs and early diagnosis and management of adrenal insufficiency.

References:
IN VITRO CYTOTOXICITY STUDY OF VENOM FROM THE RUSSELL’S VIPER (*DABOIA RUSSELLII*) AND COBRA (*NAJA NAJA*) IN SRI LANKA

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Objectives: Snakebite incidence caused by venomous snakes are important public health problem. *Daboia russelii* (Russell’s viper) and *Naja naja* (Cobra) are among the most venomous snakes in Sri Lanka. The objective of this study was to compare two venoms in L929 fibroblast cell lines.

Methods: Twelve samples from each snake were used for our preliminary investigations. Protein concentration was measured in each samples and serial dilution of equal protein concentration were used in this assay. Cytotoxicity of the venoms were examined and correlated with negative and positive samples. 70% ethanol was used as positive control while only media was used as a negative control. Cytotoxic assay was performed in 2 hrs and 48 hrs incubation with different concentration of venoms. Growth inhibition was compared with untreated controls to find the venom concentration, which inhibited growth by 50% (IC₅₀). Furthermore, cell morphology versus treatment was examined under dissecting microscope with controls.

Results: Protein concentration of two species of snakes revealed that venoms of *Naja naja* contained high protein concentration (3.62±25mg/ml) compare with *Daboia russelii* (1.72±0.34mg/ml). The *in vitro* cytotoxicity of 2 hrs incubation with *Naja naja* and *Daboia russelii* venoms showed mean IC₅₀ value of 95.38 and 81.35 respectively. Further, 48 hrs incubation, IC₅₀ value of 81.65 and 48.32 respectively. Following incubation of L929 fibroblast cell lines with two venoms, various morphological abnormalities were observed. During preliminary study, all cells were dead in 320ug/ml and 160ug/ml in 2 hrs incubation with *Daboia russelii* and *Naja naja* venoms respectively. However, 48 hrs incubation, 80ug/ml concentration of *Daboia russelii* showed 100% cell death, but 180ug/ml with *Naja naja*. Further, this study reveled that mildest dosses resulted in several cells losing their characteristic appearance and an increased number of rounded cells.

Conclusion: In conclusion, this study indicated that *Daboia russelii* venom show more cytotoxicity compare with *Naja naja* in both 2 hrs and 24 hrs incubation with L929 fibroblast cell lines. Meanwhile, results indicated that cell death caused by venoms of these two species, should be studied on the induction of apoptosis and necrosis. This is the first report that describes the in vitro cytotoxicity using cell lines and it could be established for investigating snake venom toxicity studies and efficacy of antivenoms.
Poster Abstracts

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HISTOPATHOLOGICAL FEATURES OF CHRONIC WOUNDS OF SNAKE BITE AETIOLOGY.


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Introduction: A wound is a disruption of the cellular and anatomic continuity of intact tissue which may occur due to physical, chemical, thermal, microbial, or immunological tissue trauma. The chronic wounds that develop following snake bites may display a spectrum of histological features that could be correlated with the type of venom injected. Literature regarding chronic wounds following snake bites, pathological aspects related to clinical manifestation in Sri Lanka is limited. The pathological changes may be useful in the management of chronic wounds following snake bites.

Objectives: To describe the histopathological changes seen in chronic wounds following Daboia russelii (Russell’s viper), Hypnale species (Hump nosed viper) and Naja naja (Cobra) bites.

Methods and materials: Patients with chronic wounds following sustained bites caused by different types of snakes and chronic wounds with non snake aetiology were selected for wound cleaning and if needed histological biopsy. Tissue biopsy from selected chronic wounds from Daboia russelii, Hypnale and Naja naja bites were taken and transferred to 10% buffered formal saline. Tissue fixed in 10 % formal saline was processed by routine procedure and stained with haematoxylin and eosin. Tissue sections were assessed for histological features including the superficial oedema, collagen degeneration, haemorrhage, vascular/ endothelial proliferation, types of inflammatory cells, presence or absence of granulation tissues.

Results: Tissue samples taken from chronic wounds following snake bites didn’t show superficial dermal oedema and collagen degeneration was seen in all three types. Inflammatory cells were seen in all types of wounds. Marked cell infiltration with mix picture and inflammation around the vessels could be seen. Hemorrhagic areas in hypodermis were seen in tissue sample taken from Naja naja and Hypnale species bite wounds. Vascular proliferation more in all types of chronic wounds of these snake bites compared to chronic wounds of non snake aetiology. Granulation tissues also more in chronic wounds following snake bites than the wounds of other aetiology.

Discussion: Chronic wounds following snake bites found to have more granulation tissues and vascular proliferations than wounds of other aetiology. More Lymphocytes and Plasma cells were seen wounds following snake bites and more eosinophils detected in with other aetiology than snake bites wounds. Among these three snake bites, more haemorrhages were presented in Naja naja and Hypnale bite wounds compared to Daboia russelii.
Introduction: The Philippines has high marine biodiversity. Most cases of marine envenomations are mild and self-limited but occasionally can cause medically significant complications. There are no formal registries about the incidence or prevalence of marine envenomations in the Philippines or any formal registries about the distribution of species of marine life in the archipelago.

Case presentation: We present a 25 year old Caucasian who sought consult for swelling of his right leg. Five days prior to admission, the patient was snorkeling when he felt a sudden pain on his right leg and on the volar aspect of his left arm. This eventually progressed to blister formation. On the interim, he noted decreasing urine output (< 1 liter per day) but no associated frothy urine, dysuria nor tea-colored urine. Due to worsening edema with associated pain on ambulation, he consulted at the Philippine General Hospital. He was managed as a case of a marine envenomation with secondary skin and soft tissue infection. Initial laboratory results showed azotemia and thrombocytopenia. Urine output was decreased at 200cc. He was referred to nephrology and underwent hemodialysis.

Oliguria persisted through the second and third hospital day. Whole abdominal ultrasound showed normal kidneys with no disparity in the renal size. Both kidneys exhibit normal parenchymal echogenicity with good, corticomedullary differentiation making an underlying chronic kidney disease unlikely. He continued hemodialysis and was eventually sent home.

Discussion: A Cnidarian specie found in the area where he was stung is the are Box Jellyfish (Chironex fleckeri). Chironex fleckeri is considered a coastal species and is never found off shore. C. fleckeri is mostly translucent, it is seldom seen by victims even after a sting. Most stings are minor presenting only with local symptoms. However, massive envenomation can lead to systemic complications and even death.

Box jellyfish envenomation causes injury through toxinologic and immunologic mechanisms. Chironex fleckeri venom contains several proteins that act on different tissues in the body. The two most abundant proteins are C. fleckeri toxin-1 (CfTX-1) and toxin-2 (CfTX-2). These toxins like other cnidarian venom proteins are pore forming and are known to cause hemolysis and adverse effects on the cardiovascular system.

Injury also results from the immune reaction of the body to the tubules embedded after the sting. They have been shown to increase IgM, IgG, interferon and tumour necrosis factor synthesis. They also promote inflammatory cytokine secretion, antibody secretion and population changes in immune cells.

In vivo effects of a related Cnidarian caused prostration, decreased activity, dyspnea, piloerection,
abnormal movements, convulsions and even death. In anatomical analysis, majority had renal glomerular swelling, renal vesicle stricture and renal tubular dilatation. Other effects included hepatic sinusoid dilatation, pulmonary edema and pleural effusion, and oral and gastrointestinal bleeding. HE staining of organs showed severe injury in kidneys and liver.

**Learning Points:** Some species of jellyfish in the Philippines can cause acute kidney injury. Adequate first aid is needed to prevent significant complications. Hemodialysis might be needed to manage acute kidney injury caused by marine envenomations.
ESTABLISHMENT OF VENOM STANDARD FOR POTENCY TEST OF AGKISTRODON (SALMUSA) ANTIVENOM

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Objectives: NIFDS has supplied standardized goods to manufacturer as national venom standard. These are nationally controled and used in lot release and quality control of manufacturer. It has been ceased to distribute 1st national venom standard because of a shortage of goods in stock. The candidate material for 2nd national venom standard was developed and manufactured in identical process of 1st national standardized goods. The quality of the candidate material which manufactured in manufacturer was validated to meet acceptance of QC test. This study is to establish the potency of the candidate material as 2nd national venom standard.

Methods: Manufactured candidates were evaluated for quality evaluation through quality control tests (lethal dose test, hemorrhagic dose test, lethal toxicity, minimal hemorrhagic dose). The test method is referred to the report of the establishment of 1st venom standard for potency test in Korea. The potency of this candidate preparation was determined using the Reed-Muench method for the lethal test and the standard linear regression analysis for the hemorrhagic test.

Results: In case of lethal toxicity (LD₅₀), the average value for 3 times test results is 27.5 μg (95% confidence interval : 25.9-29.1), and the average value for 3 times test results is 0.98 μg (95% confidence interval : 0.72-1.23) in minimal hemorrhagic dose. The average value for 10 times lethal dose test results is 88.9 μg (95% confidence interval : 85.1-92.9) and hemorrhagic dose test results is 10.2 μg (95% confidence interval : 9.5-10.9).

Conclusion: The candidates of the 2nd national venom standard are verifying titer maintain and stability though long-term stability test and accelerated testing in manufacturer. After verifying quality, it’s availability for the candidate as the 2nd national venom standard shall be verified with further collaborative study with 4 participated institutions to assign the stated potency. Finally, the national standard can be used for quality control of Salmusa antivenom products in Korea after approval by NIFDS.
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ANGELIC TRUMPET, DEVIL’S BREATH

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Background: Believes and myths often cloud the rightful mind, and this might be applicable when it comes to the use of Traditional Chinese Medicine (TCM) in Malaysia. TCM is regarded as a form complementary medicine and its widespread misconception of being safe because of their natural origins, has gained trust from the general public, notably in Chinese population.

Case presentation: We reported a case where a 33 year-old Chinese man patient presented to the Emergency Department who developed anticholinergic poisoning after ingesting brews of Datura metel obtained from a local chinese herbal shop for diarrhea. His prominent clinical features included confusion, agitation, tachycardia, flushing, dilated pupils and dry lips. The patient had a spontaneous recovery within 48 hours with supportive measures in the intensive care unit, and no sequelae noted.

Discussion: Datura metel (Yangjinghua) is also known as ‘Devil’s Trumpet’, which is under the family of Solanaceae. It is a domesticated, night scented plant, which occurs naturally in both the new and ancient world. Recent studies in the 20th century showed the species originated in America, rather than traditionally believed as Greek, Arabic or Indian sources.

Its long histories of use as an indigenous herbal plant in treating asthma, bronchitis, pain, epilepsy and skin diseases; has different purposes in the modern medicine. Nevertheless, datura metel is cultivated as a source of tropane alkaloid and scopolamine. Therefore, it can be detrimental if overdosing occurs, where it can induce anticholinergic, hallucinogenic, psychotropic poisoning or even death.

In this case, our patient had a lack of understanding of the possible risks of purchasing TCM over the counter, and clear direction of the possible adverse events from Datura metel ingestion, as well as drug-to-drug interactions, was not warned. Moreover, the cause of patient’s symptom was not addressed appropriately before prescribing such potentially harmful herbal plant. The other contributing factor to the poisoning may be as a result of confusion from different names ascribed to Datura metel in chinese medicine. Last but not least, physostigmine was not used to treat the patient’s anticholinergic toxicdromes, as there are studies demonstrating either the length of hospital stay or duration of intensive care use do not decrease with such measure.

Lesson Learnt: The widely and inappropriate usage of herbal medicine is a main concern in most parts of the world. Hence in cases of ‘unexplained’ anticholinergic poisoning, high index of suspicion of overdosing Datura metel should be raised.
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CASE REPORT OF VERATRUM NIGRUM L. POISONING IN MACAU

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Background: Veratrum(藜蘆, veratrum nigrum L.), which is also called black veratrum (黑藜蘆), human hair, Qili Dan, is pronounced as LiLiù in China. There is rare reporting among English writing literature. This paper analyzes a poisoned patient was admitted C.H.C.S.J. in 2014 and aims to show her characteristics.

Veratrum nigrum L. is very toxic and the toxicity patterns are similar to aconitine. The therapeutic dose and toxic dose are very close to make it a dangerous drug. It stimulates the gastrointestinal and acts on central and peripheral nervous system, lead to arrhythmias, respiratory and circulatory failure.

Veratrum as a group is quite common in Chinese and the United States. However, veratrum nigrum L. has few poisoning cases overseas and almost none reported in the European and American journals or able to be searched in pubmed. Veratrum nigrum L. is different from veratrum album and in Europe, Japan there were cases of veratrum album poisoning being reported.

There is no current diagnostic criteria for veratrum nigrum L. in China, making the diagnosis and standard treatment become difficult. There are some Chinese reports about this herbal medication poisoning in 2014.

Case Presentation: A 51-year-old woman presented gastrointestinal effect and dizziness after taking veratrum nigrum L. Later she developed hypotension and need fluid and intropic support. After treatment, the patient recovered uneventfully and later it was proven by the drug administration department that the chinese herbal pharmacy wrongly picked up veratrum nigrum L. while mixing the formula. The original prescription uses 10 grams of raphonticum uniflorum (L) DC(漏蘆), but was wrongly taken 10 grams of veratrum nigrum L. and resulted in poisoning.

Conclusion: This paper summarizes the preliminary investigation of veratrum nigrum L. poisoning and case characteristics. It is quite certain that this toxic drug can cause arrhythmia, respiratory and circulatory failure.

This article deepens the frontline physicians’ understanding of veratrum nigrum L. poisoning. Investigations of this traditional Chinese medicine poisoning treatment found that although some strategies reported but supportive treatment is still mainstay. Other treatments such as atropine usage still need to be confirmed by further studies. The drug making and stocking system of chinese pharmaceutical industry still has rooms of improvement. Finally, the education of drug poisoning prevention is of great importance in the community.

Keywords: Chinese medicine poisoning; Veratrum nigrum L. poisoning; Epidemiology; Macao SAR
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THE PRACTICES OF SNAKE BITE PATIENT MANAGEMENT IN SRI LANKA - A RURAL HOSPITAL STUDY

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Objectives: Snake envenoming is a major public health problem in Sri Lanka leading to significant illness and death. This study aims to assess the current practices of snake bite patient management in a rural hospital of Sri Lanka and to compare with guidelines recommended by the Sri Lanka Medical Association (SLMA).

Methods: Current study was a retrospective cohort study carried out at medical wards and the paediatric ward of Base Hospital, Elpitiya. All the patients admitted with snake bites from 1st of January, 2014 to 31st of December, 2014 were recruited to the study. Patient demographic and clinical data were collected. Management of patients was solely decided by the treating physicians.

Results: Of 489 patients traced as snake bite patients, [43 (8.8%), <12 years, 205 (41.9 %), females] snake specimen was available only in 70 (14%). The median time interval between snake bite and hospital admission was 1 hour and 13 minutes (range: 15 minutes-4 days). The 20-min whole blood clotting test (WBCT20) was positive in 41.9% and only 5.7% received Indian polyvalent antivenom (AVS). Most common identified snake was Hump-nosed viper (Hypnale sp.: 11 %). Of the 419 unknown snakebites, 186 (44.4%) had positive WBCT20 but only 23 (12.3%) received AVS. Surgical complications were severe enough to transfer to the surgical unit in 42 patients. Ten patients were transferred to a tertiary care centre for further management. Deaths were not reported. Local pain and swelling was managed with paracetamol, tramadol, and frusemide. One hundred and twelve (22.9%) patients were received tramadol for pain management and 244 (50%) patients were treated with frusemide to reduce oedema. Twelve patients with severe pain in the bitten finger had been given a ring block with lignocaine. Local anesthetic agent was lignocaine and those who received it had immediate pain relief which did not recur. Local anaesthetic cream had been applied on the bite site of 28 patients as a pain relief agent with a satisfactory pain control.

Conclusion: There are some differences between the current practices of managing unknown category snake bites in the study hospital and SLMA recommended guidelines. The utility of WBCT20 test is doubtful and limited sensitivity when managing unknown category snake bites in the study hospital. Identifying the snake without the specimen was not considered or may not be practical in ward setting. There are some new methods of local pain management and guidelines should also focus on pain management after snake bite. SLMA guidelines should not be limited to medical wards but to the surgical managements.
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ULTRASOUND GUIDED SIMPLE GALLBLADDER ASPIRATION FOR AMATOXIN MUSHROOM POISONING (AMP) INDUCED HEPATOTOXICITY AND FULMINANT HEPATIC FAILURE: AN EFFECTIVE TREATMENT ALTERNATIVE WHEN IV SILIBININ IS UNAVAILABLE OR LIKELY TO FAIL

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Objectives: IV silibinin combined with sustained aggressive IV hydration reliably reverses severe amatoxin induced liver failure & induces recovery, but there is no effective pharmacological alternative for developing countries where the drug is unavailable or when oliguric AKI renders SIL treatment failure virtually inevitable. Beagles with surgical biliary fistulas survived fatal amatoxin doses, suffering far milder liver injury than controls. An encephalopathic St Louis AMP with peak INR 5.9 rapidly recovered following ERCP nasobiliary drain placement with suction in a 2006 publication. Over 4 mg amatoxin (7.24 mcg/ml alphaamanitin) was recovered from 3 days bile collection.

Methods: Six severe Assamese AMPs received FFP before undergoing surgical open cholecystostomy. Three died shortly afterwards from preexisting FHF complications. Three with INRs> 4 but intact renal function rapidly recovered. An American ingested 5 large deathcap mushrooms, quickly recovering from severe FHF after Percutaneous Cholecystostomy (PC) by IR. 72 hour aggregate bile samples from each Indian & daily American samples underwent HPLC analysis.

Results: Indian specimens contained 3.0611.67mcg/ml of alphaamanitin. No detectable amanitin was measured in subsequent daily American samples, but bile aspirated during the PC procedure itself contained 22.3 mcg/ml. ERCP, PC & simple gallbladder aspiration has subsequently been associated with FHF recoveries in Hanoi, Assam, Vancouver & 2 California dogs. The American suffered mild bile peritonitis following tube removal 14 days post PC requiring analgesia & overnight hospital observation.

Conclusions: Ultrasound guided simple gallbladder aspiration is a promising AMP treatment alternative when SIL is unavailable (developing countries) or likely to fail (oliguric AKI). The procedure is minimally invasive, technically straightforward & quickly accomplished at the bedside using local anesthetic. Risks of infection, hemorrhage & bile peritonitis are substantially reduced compared to PC which requires Interventional Radiology & 24 weeks of tract maturation before removal. Tube placement may be unnecessary; most measureable amanitin appears to be removed with one complete aspiration, which can be performed again 2448 hours later. Transhepatic approach before coagulopathy (INR >1.6) develops, otherwise transperitoneal, following prophylactic FFP
administration. ERCP nasobiliary drain placement requires a highly trained GI specialist, general anesthesia, OR time & OR staff. ERCP has 50% failure rate & 5% risk of pancreatitis. Hemorrhage is likely if a sphincterotomy is cut. Gold standard LCMS

amanitin quantification from bile is under active development. Bile matrix amanitin extraction has proven challenging due to high salt, particulate & lipid content interfering with MS ionization chromatography.
A REASSESSMENT OF NATIVE DISTRIBUTION AND FUTURE CONCERNS IN LIGHT OF REPORTS OF ALOCASIA POISONING

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Alocasia (elephant’s ear) is an evergreen perennial of the Araceae family that grows to a height of one to one and a half meters. The plant has calcium oxalate crystals, a poisonous substance, throughout. Alocasia is well known as a decorative plant, and most varieties grow well in a warm indoor environment. The stalks are similar in appearance to taro, and there are countless examples of food poisoning from mistaken ingestion of the plant in the wild. In Japan, textbooks generally note that wild alocasia natively grows in the southern part of Shikoku and Kyushu down to Okinawa, though there have been scattered reports in recent years of alocasia growing outside these areas, primarily in the northern part of Kyushu. Based on these reports, this paper reassesses the native distribution of alocasia growth, and, given the growth in alocasia’s native environment, also considers the current state of affairs in which knowledge is required in areas that have not traditionally had to worry about properly identifying the plant.
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MECHANISM OF HYPOTENSION IN CLEISTANTHUS COLLINUS POISONING

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\textit{Cleistanthus collinus} is a common plant poison used for suicides in Tamil Nadu. Cleistanthin C is the major toxin in the boiled aqueous extract of \textit{C. collinus}. Mortality rate is around 28\% and death occurs 3-7 days after poison ingestion. Refractory hypotension due to vasodilatation is the major cause of death in patients.

While investigating vasodilatory mechanisms in a goat arterial strip, we identified a new signaling pathway in which, alpha adrenergic stimulation causes paradoxical vasodilatation in high NO environment (Plos One 2016). The vasodilatation was cGMP independent. It was demonstrated that a combination of L-Arginine/phenylephrine (PE) induces vasodilatation, which is blocked with L-NNA or phentolamine, but not with propranolol. Here we report that Cleistanthin C acts through the new pathway, leading to vasodilatation, when there is simultaneous alpha adrenergic activation.

Objective:
To study the effects of Cleistanthin C on vascular tension in goat arterial strip

Method:
A section of a small artery was isolated from the goat leg and cut spirally. Spiral strip was suspended in an organ bath (25 ml), filled with physiological salt solution at 37\(^{\circ}\)C, aerated with carbogen (95\% O\textsubscript{2} & 5\% CO\textsubscript{2}). One end of the strip was attached to a force transducer connected to a data acquisition system (Power lab). Optimal preload was applied to keep the thread taut. Drugs were added to the organ bath; changes in tension were recorded and analyzed.

Results:
Cleistanthin C (100\mu M) \textit{per se} did not produce any change in the vascular tension. But subsequent addition of PE (100\mu M) resulted in vasodilatation (n = 6, P = 0.028 with Wilcoxon signed rank (WSR) test) (Fig 1).

![Fig 1: Representative tracing of tension recording in spiral strip of goat artery showing reduction in vessel tension with Cleistanthin C/ PE combination.](image-url)

Cleistanthin C/ PE induced vasodilatation was abolished in the presence of L- NNA (1mM) (n=4)
(P = 0.011 with Mann-Whitney U test when tension after Cleistanthin C/PE combination were compared with and without L-NNA). Cleistanthin C/PE combination did not produce vasodilatation in the presence of prazosin (10µM) (n = 5, P = 0.008 with Mann-Whitney U test when tension after Cleistanthin C/PE combination were compared with and without prazosin).

**Conclusion:**
Cleistanthin C creates an environment in which alpha adrenergic stimulation results in vasodilatation, which is nitric oxide-dependent.
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ADVERSE REACTIONS TO F(AB’)_2 ANTIVENOM OF SNAKEBITE PATIENTS

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Objectives: To evaluate the incidence of adverse effects of snake antivenom and patient outcomes after snake bite.

Methods: Retrospective analysis of patients who were consulted to Ramathibodi Poison Center from January 1 to December 31, 2016.

Results: A total of 472 snakebite patients were consulted to Ramathibodi Poison Center during the study period, however, 297 patients (62.9%) were identified as bitten by venomous snakes. Among these venomous snake bitten patients, 228 patients (76.8%) met the criteria to be treated with F(ab’)₂ antivenoms. They are 7 specific monovalent and 2 polyvalent antivenoms which are produced by Queen Saovabha Memorial Institute, Thailand. The mode and median age of all patients were 37 year-old (range 11 months – 82 years. Most of initial severity was moderate to severe (78.5%). The medical outcomes were minor effect (7.5%), moderate effect (82.0%), major effect (7.0%), and death (2.6%). Among the patients who were treated with antivenom, 46 patients (19%) developed early adverse reactions (EARs) within 3 hours after antivenom administration. The percentage of patients who had EARs were different among the different antivenom; Malayan krait 33.3%, Malayan pit viper 28.6%, cobra 21.1%, green pit viper 14.3% and Russell’s viper 7.1%, and none for king cobra. For the polyvalent antivenoms, for hematoxin 20% and 18.5% for neurotoxin. The grading of EARs can be classified as following: severe 23.9% including one fatality, moderate 39.1% and mild 37.0%.

Conclusion: Antivenom is an essential therapy for snakebite patients. However, the F(ab’)2 antivenoms may also induce EARs. The incidences of EARs varied among various study. This study found 19% of EARs. Each antivenom caused EARs at the different rate, ranged from 7-33%. Size of this study was small, further study should be done to provide a clear picture.
TIA AFTER MUSCADOL INGESTION - A CASE REPORT

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Introduction: Muscadol is a common medication used worldwide. It contains acetaminophen Paracetamol 450 mg and orphenadrine citrate 35mg. Paracetamol is widely used as an analgesic while orphenadrine citrate is an anticholinergic muscle relaxant. Side effects of both the components are well known. In this case report we would like to bring out a complication caused by the orphenadrine component of Muscadol.

Case Description: 89 years old female with no previous comorbidities other than osteoporosis was brought by EMS after her family found her unresponsive for about 30 minutes at home. There was no witnessed seizures or abnormal movements. Upon physical examination patient was awake and alert with GCS of 15/15. She was tachycardic with heart rate of 130-140 beats/min. ECG showed new onset Atrial fibrillation. Patient was worked up as a case of TIA secondary to Atrial fibrillation. Her basic lab workup were normal. CT did not show any intracranial bleed or ischemia. Echo was normal and no ischemic change. Upon reviewing her medication profile it was found that the patient was recently started on Muscadol (paracetamol 450mg / orphenadrine 35mg) for osteoporosis 7 days prior to her event. Cardiology and neurology consultation were sought with full investigation, which all came to be normal. Patient was started on beta blocker initially and muscadol was stopped. Patient reverted back to sinus rhythm.

Discussion: Atrial fibrillation has been reported by people with many conditions. A recent study done for 484 people who reported side effects when taking orphenadrine citrate showed atrial fibrillation in 12 of them (2.48%). Of these 100% of them were female with 14.29% between age group 50-59 and 85.71% were 60+ years. Although many conditions and medications can cause atrial fibrillation, Muscadol or any drug containing orphenadrine should be considered or taken into account in context of medication. So in conclusion, the risk of atrial fibrillation stands out more in elderly females above 60 years of age but being reversible once the drug is stopped.
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EVALUATION OF THE PROTECTIVE EFFECTS OF NERIUM OLEANDER BY SENSITIVE BIOMARKERS

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Objectives: Even though herbal products could be extensively preferable due to their widespread accessibility, modern scientific methods and clinical trials are needed to be applied to confirm the claims about their therapeutic effects and safety. Nerium oleander (Apocynaceae), also known as “The Desert Rose”, grows widely across the globe in warmer climate areas with a history over 1500 years and has been the subject of research for centuries as a medical herb. It is one of such plants which are famed for its therapeutic efficiency in different diseases globally. Among these is its traditional use in the treatment of dermatological disorders such as dermatitis, eczema, psoriasis, boils, herpes, ringworm, scabies, and warts.

The aim of this study was to evaluate the safety and the wound healing property of Nerium oleander (NO). For this purpose the extract of NAE-8® (Nerium Aloe Extract) has been obtained from (Nerium SkinCare, Inc.®, USA).

Methods: The animals were randomly divided as; control, burn without treatment, burn- NAE-8®, and burn- silver sulfadiazine (Silverdin®) treatment groups. All treatment groups received their respective topical application twice a day for 14 days. Burn injury is known to be accompanied by release of reactive oxygen species and one of the goals of the dermal health is to provide anti-oxidant support. Malondialdehyde (MDA) and Comet assay were carried out to measure oxidative stress, lipid peroxidation and strand breaks.

Results: Skin MDA levels were higher in the burn group with respect to the control (185.380±17.548 vs. 15.233±1.737; p<0.001) and NAE-8® treatment reduced MDA levels significantly (47.068±12.712; p<0.001) than Silverdin® (170.36±39.540). The loss of the epidermis and accumulation of polymorphonuclear leukocytes were the major features observed in the wounded skin. NAE-8® treatment reversed this effect via improving epithelization and fibroblast infiltration. Significant decrease in the mean %DNA(T) (p<0.01) was observed in the NAE-8® treatment group (27.907±0.284) as compared to burn group (30.250 ± 0.734).

Conclusion: Today all over the world, various medical and pharmaceutical tests are being performed with the extract of NO to reveal more of its therapeutic potential. Dermis and epidermis degeneration and improving fibroblast infiltration, reduced MDA levels and significant decrease in DNA damage observed in the NAE-8® treatment can be attributed to wound healing and protective effect of the NAE-8®. It is hoped that extreme importance will be given to NO to identify its therapeutic potential to prove itself by combining ancient knowledge of traditional medicine with modern science.
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RETROSPECTIVE ANALYSIS OF MUSHROOM POISONING IN LIAONING PROVINCE IN 2015

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Objectives: We analyze 12 cases of mushroom poisoning in Liaoning province from August to October in 2015, to find the reason of poisoning, in order to avoid the occurrence of poisoning in the future.

Methods: We make a statistics of 42 patients in 12 mushroom poisoning cases in 2015 from August to October, including 5 deaths, mainly in Dalian, Dandong, Fushun, Liaoyang. We analyze the causes, the incidence of performance, treatment and the final outcome.

Results: In previous years, the mushroom poisoning is generally less than 5 cases in Liaoning Province per year, very rare deaths.

The poisoning patients are mostly mountain residents, with many years of experience of identify edible wild mushroom. The mushroom causes poisoning has never been poisoning performance.

For the early onset, most of the performance is abdominal pain, diarrhea and vomiting. The performance of liver damage occurred after a few days, including jaundice and coma. The children are more serious. The treatment in local hospital is invalid to cure. The patients are transport to Superior hospital to continue treatment. After the treatment of hemodialysis in long time, most patients were getting better. The patients who did not take hemodialysis in time, the condition changed for the worse. Unfortunately, except one patient was proved to be poison by Amanita toadstool, the other cases were unable to trace specific toxic fungi.

In most cases, the wild mushroom species have a long-term human edible history, and they cannot be determined by the environmental pollution.

From the poisoning events, consider the high temperature and rainy weather in 2015, it may lead to change the low toxicity of wild fungi into high toxicity , and eventually lead to food poisoning. Most of them performed a serious liver injury, and it is showed more danger in children.

Conclusion: These events remind us that the toxicity of wild mushroom may be changed, it is safe to not to eat them. After eating the wild mushroom, people should go to the hospital as soon as possible once the poisoning occurred.
A REPORT OF A CONFIRMED CASE OF BEAUTIFUL PIT VIPER (TRIMERESURUS VENUSTUS) BITE

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Objectives: To report a confirmed case bitten by a beautiful pit viper (Trimeresurus venustus)

Methods: A 24-year-old snake handler male in Snake farm, Queen Saovabha Memorial Institute, was bitten by a beautiful pit viper (T. venustus) on his right thumb during cleaning the cage. He presented in the emergency department 15 minutes later. His vital signs were within normal limits. The patient suffered from the pain score of 6/10 and mild nausea. Two fang marks about 9 mm apart were noted on the base of his right thumb. Swelling with tenderness of the hand progressed to the wrist within an hour. There were no petechiae, ecchymoses, blebs, bleeding per gum and abnormal bleeding anywhere. The radial and digital artery pulses were normal. The CBC showed normal platelet count and no abnormal red blood cells morphology. The 20-minute whole blood clotting test was normal and INR was 1.1. The treatment was supportive with arm rest and tramadol as analgesic.

Results: The swelling was progressed to the mid-forearm within 4 hours. Next morning about 20 hours after the bite, the swelling was extended to mid-arm but the swelling at mid-forearm was markedly decreased and the pain score was 3/10. INR was 1.03. Then the overall clinical features were improved significantly. Tetanus toxoid was given before he was discharged on the second day of admission. Three days after the bite, the pain and swelling were almost subsided. He could do daily activities and his coagulogram was normal.

Conclusion: The snake was identified by the experienced veterinarian of the snake farm as T. venustus. This snake with a common name of beautiful pit viper is a green pit viper seen in Thailand and Malaysia. It was sometimes misidentified as T. kanburiensis or T. purpureomaculatus and vice versa. No confirmed case of its bite was reported until this case. The clinical features were mild and required only supportive care. However, the physicians should beware of hemostasis disturbances commonly found in green pit viper bites.
Objective: Colchicum plant or suranjan from colchicaceae family, contain colchicine alkaloid. Colchicine is used in treatment of several diseases such as gout, familial Mediterranean fever, amyloidosis, arthritis and spondyloarthropathies. Colchicine inhibit microtubules and prevent cellular mitosis.

Method: Uneducated couple, 57 years old woman and 61 years old man recommended using a local plant for knee pain relief. The man with a history of cardiac disease, admitted in hospital about 12 hours after using boiled plant complaining nausea, vomiting, abdominal pain diarrhea and weakness while he was conscious. Laboratory data showed sever metabolic acidosis and acute kidney injury. After 2 hours he got unconscious and hypotensive and underwent mechanical ventilator. Unfortunately he died 10 hours after admission. The woman with history of diabetes mellitus and hypertension complaining nausea, vomiting and diarrhea about 8 hours after suranjan consumption admitted in hospital with cardio respiratory arrest and underwent cardio respiratory resuscitation. Laboratory data reviled sever metabolic acidosis, acute kidney injury and liver enzyme elevation. After several cardio respiratory arrest, she finally died 11 hours after admission.

Conclusion: Colchicum with local name of suranjan is a plant with long green leaves and bulb-like corms that has widespread usage in traditional medicine. Toxic dose is greater than 0.5mg/kg and more than 0.8mg/kg is fatal. Clinical finding is described triphasic including gastro intestinal effects, multi organ dysfunction and finally recovery or death. It is important to know many plant in nature has therapeutic effects in controlled dose, although many people think all herbal material are safe and if it is not useful, it is not hazardous. It is important to aware general population about side effects and danger of herbal preparation especially in counties with ancient history of traditional medicine like Iran.
EFFECTIVENESS OF PHYSOSTIGMINE COMPARED TO BENZODIAZEPINES IN THE TREATMENT OF ANTICHOLINERGIC DELIRIUM

James Barton 1, Andis Graudins 1,2

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Objectives: To compare the effect of physostigmine and benzodiazepines in the treatment of anticholinergic delirium as measured using the Richmond Agitation-Sedation Scale (RASS) and Delirium Score. Time required to repeat dosing of either drug 3) Incidence of adverse events between the two classes of drug.

Methods: Retrospective chart review of referrals to our Toxicology Service with signs of anticholinergic delirium from August 2013 to Feb 2016. Fifty-one patients were identified. Nineteen were treated with benzodiazepines only, four were treated with physostigmine, nine were treated with both and 19 did not receive pharmacological treatment. RASS and delirium scores were calculated from nursing and medical observations pre- and post-drug administration. Time to repeat dosing was calculated as the mean time between repeat doses of either drug for each patient with a minimum time of 30 minutes between doses to allow for titration.

Results: Antihistamine intoxication was the most common reason for anticholinergic delirium (n=20, 39%), followed by antipsychotic agents (n=17, 33%), tricyclic antidepressants (n=6, 12%), anticholinergics (n=5, 10%) and others (n=3, 6%). Tachycardia (n=47, 92%) was the most common clinical feature followed by dry skin (n=42, 82%), urinary retention (n=30, 59%) and mydriasis (n=16, 31%). Initial median RASS was 2 (range 1-4) and median Delirium score was 2 (range 1-3) for both physostigmine and benzodiazepine groups. Median RASS was 1 for the group who did not receive medications. This group included patients who had ingested medications with significant sedative effects. Physostigmine showed a statistically significant reduction in both RASS (mean reduction of 2.46 vs 1.62; p<0.05), and Delirium scores (mean reduction of 2.15 vs 0.76; p<0.05) compared to benzodiazepines. There was no difference in median time to repeat dosing (benzodiazepines 122.75 minutes vs physostigmine 192.5; p=0.11). Adverse events were noted in 14% (4/29) who received benzodiazepines. Excess sedation (RASS ≤ 3) occurred in three patients (10%). One patient required a nasopharyngeal airway and desaturated to 89% on room air. One patient had an adverse reaction to physostigmine consisting of cholinergic effects (vomiting, transient hypotension, and heart rate of 61 bpm) following 1mg physostigmine given over 10 minutes.

Conclusion: While numbers are small, this case series supports previous observations that physostigmine seems more effective at reversing agitation associated with delirium. Both benzodiazepines and physostigmine may cause adverse events and they should be administered in a monitored environment and titrated to effect.
ANTI-XA ACTIVITY IN APIXABAN OVERDOSE: A CASE REPORT

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Objectives: Apixaban is a novel oral anticoagulation agent that exerts its effect through direct factor Xa inhibition. We present a case of multi-drug overdose including apixaban with associated apixaban concentrations.

Case Report: A 53 year-old man presented to our metropolitan hospital following a deliberate self-poisoning with 200mg apixaban, 35mg ramipril, 105mg bisoprolol, 280mg atorvastatin, 6mg colchicine, 37.4mg magnesium, 4x500mg paracetamol/9.5mg codeine/5mg phenylephrine and alcohol. He developed hypotension that was treated with noradrenaline. It was felt that this was the result of his ramipril and bisoprolol overdose. He did not develop any significant bradycardia or conduction delays to suggest significant beta-blocker toxicity. Initial coagulation studies, measured 6 hours post overdose, showed an International normalized ratio (INR) of 3.6 (0.8-1.2) (HaemosIL RecombiPlasTin 2G assay), activated partial thromboplastin time (APTT) of 37 (22-32 secs) and Anti-factor Xa activity concentration of 1.73 U/ml (based on low molecular weight heparin, therapeutic range 0.5-1U/ml). Apixaban concentrations were derived directly from anti-factor Xa chromogenic assay (ACT-TOP machine, HaemosIL Liquid Anti Xa assay and Stago apixaban calibrator). His initial and peak apixaban concentration (at 6 hours post-ingestion) was 1022.6 ng/ml and was associated with only minor bleeding from his femoral central line insertion site, which improved with local compression. Vitamin K 10mg (at 9 hours post ingestion) and Prothrombinex-VF 2000 units (at 13 hours post ingestion) were administered without any observed effect on coagulation studies. Apixaban elimination appeared to display first-order kinetics (r²=0.97) with an elimination half-life of 7.4 hours. His serum apixaban concentration entered the therapeutic dose range at 10 hours post-ingestion and he recovered uneventfully.

Conclusion: A peak INR of 3.6 was seen in our patient correlating with a previous study’s (1) linear INR/apixaban concentration relationship. This suggests that the INR may have a role in risk assessment of overdose and the ongoing monitoring of the anticoagulation effect of apixaban, if the anti-Xa assays are not available. There is considerable variation in sensitivity of prothrombin/INR assays to apixaban and this should be taken into account when interpreting these results. Apixaban did not appear to show any saturation absorption kinetics. There was rapid resolution of anticoagulation with no demonstrable benefit of currently available clotting factor replacement.

BRUGADA SYNDROME UNMASKED BY AMITRIPTYLINE

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Objectives: Brugada syndrome is a genetically determined sodium channel dysfunction characterised by ECG abnormalities in anterior chest leads V1-3 with normal structure of the heart. We report a patient who developed Brugada syndrome while possibly taking an overdose of amitriptyline and developed seizures, ventricular tachycardia and syncope.

Methods: A case report of a patient who was taking amitriptyline developed Type 1 Brugada Syndrome.

Results: A 46-year-old man presented with a history of witnessed seizure, GCS 5 (response to painful stimuli only), cyanosis, agonal respiration and bradycardia (Day 0). Empty packets of unknown drugs were noted. He has a history of heavy alcohol use, hepatitis B and C and alcohol related seizure. In the Emergency Department, his GCS was 3, HR 128, BP 90/70 and has a lactic acidosis (lactate=14 mmol/L). Blood ethanol level was negative. ECG showed a broad complex tachycardia with a coved type ST segment elevation in anterior chest leads. He was managed with a further bolus dose of sodium bicarbonate with narrowing of the broad complex tachycardia, intubated and hyperventilated to pH 7.5. Urine drug screen was negative for amphetamine or cocaine but positive for opiates and benzodiazepines. He has intermittent jerking movement which was managed with midazolam bolus and infusion. Echocardiogram showed normal left and right ventricular function with abnormal septal motion likely related to bundle branch block. CT brain was normal. He developed short self-limiting episodes of ventricular tachycardia overnight. He was extubated next day with resolution of the ECG changes by the second day of admission.

He was commenced on 50 mg daily amitriptyline about 1 month before admission for the management of his peripheral neuropathy. He denied taking any overdose of medications. An amitriptyline level taken on the 3rd day of admission was 0.31 µmol/L (0.27-0.72) and its metabolite, nortriptyline has a
concentration of 0.55 µmol/L (0.19-0.57) suggesting that amitriptyline concentration would have been much higher on admission. EEG performed on day 4 of admission showed no epileptiform activity.

**Conclusion:** This patient developed type 1 Brugada syndrome induced by amitriptyline which blocks the cardiac sodium channels and developed ventricular tachycardia and syncope. The possibility of amitriptyline overdose cannot be excluded.
ACUTE MENTAL STATUS CHANGE AND FEVER IN LITHIUM TOXICITY: A CASE REPORT

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Objectives:
• To highlight a case of lithium toxicity which presented as acute mental status change and fever
• To propose an algorithm for managing cases of Altered Mental Status (AMS) which can be utilized in the Emergency Department (ED)

Methods:
• Case report

Results: Lithium toxicity is classified into three major categories; namely, acute, acute-on-chronic, and chronic. Chronic intoxication is associated with the most serious toxicity. Therapeutic lithium is an essential part of the pharmacologic arsenal of clinical psychiatry. The care of lithium-poisoned patients should be predicated on rapid clinical evaluation of the patient’s condition. This report presents a case of a 45-year old female patient with Bipolar I disorder, maintained on Lithium carbonate and Risperidone, who developed acute mental status change with fever. To improve clinical outcome, emphasis was made on the importance of awareness of the symptoms, early diagnosis of complications and timely therapeutic measures. Hemodialysis is indicated in patients who are manifesting severe signs and symptoms of neurotoxicity, such as alterations in mental status. It was then recommended that continuous training of professionals in mental health awareness is a must to improve the mental health system in the Philippines.

Conclusion: Lithium toxicity is a medical emergency, potentially causing permanent neuronal damage and death. In psychiatric patients who present at the ED with acute alteration in mental status, are maintained chronically on lithium carbonate, a high index of suspicion about ongoing lithium toxicity is warranted. Awareness of the symptoms of toxicity, early diagnosis of complications, and timely therapeutic measures on the part of the physician can ultimately lead to improved clinical outcomes.
ORPHENADRINE INGESTION: A CASE SERIES

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Objectives: Orphenadrine is an antihistamine possessing both anticholinergic and sodium channel blocking properties. Orphenadrine overdose has been relatively rare because it has been superseded by better therapeutic alternatives. However, the trend toward utilising non-opioid agents to treat chronic pain has seen a resurgence in the therapeutic use of orphenadrine for its antispasmodic effects. This study aimed to describe orphenadrine ingestions presenting to a regional toxicology service.

Methods: The Hunter Area Toxicology Service database (HATS) was searched for ingestions involving orphenadrine from 2000 to 2015. Data extracted included age, sex, dose ingested, coingested toxins, disposition ward, length of hospital stay and any complications which occurred.

Results: There were a total of 14 presentations to HATS within the database. Of these, 4 occurred prior to 1996 and 10 occurred from 2008 onward. Of the latter 10, six were male and median age was 44 years old (range 31-51). Ingested dose was unquantified in three cases, one of which was supratherapeutic use rather than acute an acute monointoxication. Less than 500mg was ingested in three cases and greater than 3g in four cases. The median length of stay was 35 hours (range: 16-378h). Intubation and intensive care was required in three cases all of whom ingested 3g or greater. Seizures occurred in four cases, three whom ingested greater than 3g, with multiple seizures occurring in 2 of these cases. In the case of seizure ingesting less than 3g, tramadol, a potential confounding pro-convulsant had been co-ingested. Delirium occurred in seven cases including all four ingestions greater than 3g. Quetiapine, a potential confounder, was ingested in one of these. Of the other three, one case reported ingesting 300 mg but the dose was unquantified in the other 2 cases. The QRS was greater than 120ms on electrocardiogram in two cases which were treated with hypertonic NaHCO3. Although both cases were intubated, they did not develop any arrhythmias or hypotension. This information is presented in more detail in table 1. Orphenadrine was detected in blood in two patients. In the patient ingesting 9g the elimination half-life was 60h.

Conclusion: Based on this small case series, large ingestions of orphenadrine are associated with multiple seizures and profound anticholinergic delirium. Sedative medications are likely to be required and the clinical picture may necessitate intubation and ventilation to manage the behavioural state.

Table 1

<table>
<thead>
<tr>
<th>Case</th>
<th>Sex</th>
<th>Dose ingested (mg)</th>
<th>Length of stay (hrs)</th>
<th>Delirium</th>
<th>Seizures</th>
<th>Ventilation</th>
<th>Peak QRS length</th>
<th>Confounding co-ingestants</th>
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<td>200</td>
<td>27</td>
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<td>F</td>
<td>9000</td>
<td>380</td>
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*Not Quantified
Poster Abstracts

PO-69

RAPID DETERMINATION OF LITHIUM IN BLOOD BY COLOR REACTION USING FLUORINE SUBSTITUTED TETRAPHENYLPORPHYRIN LIGAND (F28TPP)

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Objectives: Lithium (Li) preparation is widely used as an agent for bipolar disorder. Serum Li concentrations are related to Li toxicity: therapeutic and toxic levels of Li are estimated to be 0.6-1.2 mEq/L and >1.5 mEq/L, respectively. Serum Li concentrations are measured by advanced, often very expensive devices, such as an atomic photospectrometer, or an inductively coupled plasma mass spectrometer. We developed new method for rapid determination of serum Li by a color reaction, which obviates the need for using these devices. Specifically, our reaction uses the fluorine substituted tetraphenylporphyrin ligand (F28TPP) solution. For the color reaction, changes of the color phase depend on serum Li levels: green, orange, and red indicate less effective levels, effective levels (0.6-1.2 mEq/L), and toxic levels (>2.0 mEq/L), respectively. We report here an application of the method to Li intoxication cases. Additionally, to be applicable to autopsy cases, we examined the application of the method to whole blood samples.

Methods: [Application to Li intoxication case] Four microliters of serum from a patient with Li intoxication was added to 240 μL of the F28TPP solution. The mixture solution was irradiated with LED light for 1 min, and the color phase in the resulting solution was observed. The serum concentration of Li was determined on the basis of the color phase as compared with that of the reference Li standard solution (Li conc. 0, 0.9, 1.7, 3.4 mEq/L).
[Application to whole blood sample] One-hundred fifty microliters of whole blood (Li conc. 0, 0.5, 1.0, 1.9, 3.0 mEq/L) was deproteinized with 150 μL of 10% (w/v) sulfosalicylic acid solution. The solution was centrifuged, followed by the addition of 8 μL of supernatant to 240 μL of the F28TPP solution. The mixture solution was irradiated with LED light for 1 min, and the change of the color phase in the solution was observed.

Results: For Li intoxication cases, Li concentrations determined using our color phase method showed good agreement with those measured by an analyzer. In addition, the entire process was performed within only 10 min. For whole blood samples, the color phase at the concentrations of 0 mEq/L, 0.5-1.0 mEq/L, and 1.9-3.0 mEq/L presented green, orange, and red colors, respectively. These color phases were stable for 60 min.

Conclusion: Our method helps in the rapid diagnosis of clinically Li intoxication cases, and is applicable to the screening test of Li in autopsy cases.
Poster Abstracts

PO-70

SEVERE PHENYTOIN TOXICITY IN NEONATE: A CASE REPORT

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Objectives: To present a case of Phenytoin Toxicity in neonates and discuss its management.

Methods: Case Report: Chart Review - Manifestations, laboratories and treatment outcome were reviewed.

A neonate diagnosed with Multiple Congenital Anomalies, Craniosynostosis probably Pfeiffer syndrome was referred due to decrease in sensorium. On 5th day of life, patient had 2 episodes of cyanosis; she was given Phenytoin 50 mg SIVP as loading dose then maintenance dose of 12.5 mg IV every 24 hours. On 7th day of life, with no recurrence of cyanosis, Phenytoin IV was shifted to Phenytoin suspension 125mg/5 ml ordered at 4 ml every 12 hours per orem. This dosage was given for 4 doses. On 9th to 11th day of life, patient had cyanotic episodes, sudden onset of eye opening with tonic contraction of upper extremities, mandibular twitching, decreased in sensorium, bradycardia and poor pulses. Phenytoin Assay result was high at >158.40 umol/L. Immediate attention was directed towards stabilization of the patient. Double Volume Exchange Transfusion was done in attempt to eliminate the Phenytoin within the patient’s system. However, the procedure was aborted on the 10th dose because the patient had a Cardiopulmonary arrest. Hemodynamic support treatment was continued. The patient slowly recovered and was sent home improved.

Discussion: The oral Phenytoin dose given on the 7th day of life is equivalent to 40.39 mg/kg/dose, given 2x a day amounting to 80.78 mg/kg/day. The recommended maintenance dose for neonates is 5-8 mg/kg/day IV/PO divided in 2 or 3 doses. Supportive care is the mainstay of treatment. This primarily involves management of CNS depression, and, with massive overdose, respiratory depression will likely require oxygen or ventilatory support. Gastrointestinal upset, movement disorders, and other symptoms may occur, but are unlikely to require active intervention. Serum drug concentrations should be monitored. Following intravenous overdose, heart rate, blood pressure, and ECG should also be monitored. Decontamination and enhanced elimination through administration of activated charcoal is recommended. However, with a neonate patient, activated charcoal may cause necrotizing enterocolitis. Phenytoin is moderately dialyzable, hence, the decision for Double Volume Exchange Transfusion.

Conclusion: Phenytoin toxicity treatment is based on symptomatic and supportive care. Phenytoin assay must be monitored. Decontamination and enhanced elimination may be helpful but benefits must outweigh the risks.
EVALUATION OF DRUG-INDUCED APNEA IN CHILDREN ADMITTED IN LOGHMAN HAKIM HOSPITAL FROM APRIL 2012 TO APRIL 2013

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Background: Children are exposed to different environmental hazards, including poisons, which can cause irreparable effects and even be fatal for them. Poisoning in children is among the common and dangerous emergencies, but often is preventable and treatable. The purpose of this study is the evaluation of poisonings that lead to apnea in children.

Objectives: The current study aimed to evaluate the prevalence of drugs and chemical poisoning leading to apnea. Also, we detected the type of drug that induced apnea among children.

Method: This study is a cross-sectional study done among patients less than 12 years old with complaint of acute poisoning leading to apnea referred to Loghman Hakim Hospital Emergency Centre (a major center for poisoning treatment in Tehran, Iran) from April 2012 to April 2013. Data including demographic characteristics, history of the type and amount of substance used, the time between consumption and occurrence of apnea and paraclinical findings was collected then the data collected from patients’ files were entered into the data forms and the findings were analyzed using the SPSS version 20 statistical software.

Result: During the study period, 96 cases of drugs and chemical poisoning leading to apnea were observed of which 51 (53.1%) were male and 45 (46.9%) female. The age range was from 25 days to 12 years old and the highest percentage (23%) was for 1 to 2 years olds. 21 cases (21.9%) had more than one apnea episode. The mean interval between drug consumption and occurrence of apnea was 2.8 hours, with a minimum interval of half an hour and maximum of 38 hours and 8 cases (8.3%) had apnea after 10 hours of poisoning indicating a relatively long period of time from consumption to apnea occurrence. In 40% of the cases of poisoning happened inadvertently by the child, 59% was given to the child by others and in 1% it was taken with suicide intention (11 year old girl by methadone). The most common cause of drug toxicity was Methadone syrup 74%, then Opium 13%, the Baclofen (5.2 percent), Heroin (2.1%) and Diphenoxylate, Tramadol, Organophosphate, Scorpion bites and unknown (1%). 18 cases (18.8%) had a seizure too. The most common laboratory abnormalities were leukocytosis (31%) and hyperglycemia (24%). The mean duration of hospitalization was 3.1 ±0.97 days with a maximum stay of 9 days and minimum of 1 day. The mortality rate was three cases (3.1%), and all three cases were by methadone poisoning. The relationship between time of consumption of substance and occurrence of apnea is statistically significant (P =0.012713).

Conclusion: The result of this research indicate a high prevalence of apnea and poisoning and the hazardous nature of methadone in children, which indicate the availability of this dangerous substance in homes due to faulty storage and distribution of this material that even hours after poisoning can lead to apnea. Therefore, any in child presenting with apnea, methadone poisoning should be considered and appropriate treatment be given.

Key words: poisoning; Apnea; Pediatrics; Methadone
PO-72

SHORT-TERM EFFICACY OF METHYLENE BLUE IN DISTRIBUTIVE SHOCK

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Objectives: To report the efficacy of methylene blue in distributive shock patients

Methods: A retrospective chart review in patients with distributive shock whom received methylene blue (MB) in Ramathibodi hospital between 2015 to 2016

Results: There were 5 patients (age 1.8 months to 35 years) with diagnosis of distributive shock, mainly septic shock. Most of the patients (4/5) received at least 3 inotropic drugs before receiving MB. The major cause of distributive shock was sepsis (4/5). One patient had cardiogenic and distributive shock. Dosage of MB were varied, range from 1-2 mg/kg bolus with intermittent bolus dose and continuous infusion dose. All patients died in the ICU but many days later, mostly from multiorgan failure. No deaths were likely to relate to methylene blue infusion.

Conclusion: After initial resuscitation from distributive shock, methylene blue transiently increases mean arterial pressure and reduces dose of inotropes
A CASE REPORT ON CHRONIC LITHIUM TOXICITY IN A LOW RESOURCE SETTING

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OBJECTIVES: To identify how the lack of facilities in a low resource setting leads to chronic Lithium toxicity

(Background: Lithium is used for long term management of psychiatric illnesses. Lithium has dose related toxicity. Acute toxicity is not severe due to saturable absorption process. Chronic toxicity may occur with regular therapeutic doses on the grounds of renal failure. To avoid toxicity, Lithium levels and renal functions should be monitored regularly. There is no antidote for Lithium and repeated haemodialysis is life saving.)

METHOD (Case report): 54 year old lady with bipolar affective disorder, maintaining well on Lithium carbonate, admitted with tremors for four weeks and slurring of speech and unstable gait for one week. She has been requested to do Serum creatinine and Hb% on a previous clinic visit, with suspicion of chronic renal failure (CRF). Investigation results indicated CRF, but she had kept the reports for next clinic visit and kept on taking the usual Lithium dosage. Lithium toxicity was apparent with CRF on this clinic visit, where she was admitted soon and requested to do Lithium level.

On admission she had cardiac and CNS toxicity. Lithium level was very high (3.8mmol/L). She was intubated due to impending cardio-respiratory arrest. Since haemodialysis was not available, she was transferred to General hospital Monaragala, where she was haemo-dialysed five times and transferred back to us. She didn’t recover well, subsequently developed sepsis and died with multi organ failure.

CONCLUSIONS: Lithium levels should be monitored three monthly in all patients taking Lithium regularly. There are no facilities to do it in our hospital. Only few private labs in capital perform it. Being in a remote area, costly Lithium levels are not routinely ordered. This delays the early diagnosis of toxicity. High work load at clinics limit the individual attention, leading to delay in clinical diagnosis as well. Work load limits carrying out of patient awareness programmes as well. This patient didn’t aware any toxicity symptoms and hasn’t mention about tremors at previous clinic. She has kept on taking Lithium despite having CRF. Unavailability of arterial blood gas analysis and haemodialysis was crucial. Patient has to be transferred in golden first hours. Due to high demand on haemodialysis at Monaragala with high CRF incidences, she was transferred back following slight improvement. Rebound high level after haemodialysis was possible due to redistribution, making repeated haemodialysis important. All these issues combined with low resource setting have lead to the fatal outcome of this patient.
URINARY BIOMARKERS KIM-1 AND NGAL FOR EARLY PREDICTION OF CHRONIC KIDNEY DISEASE OF UNCERTAIN ETIOLOGY (CKDU) AMONG AGRICULTURAL COMMUNITIES IN SRI LANKA

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Objectives: Chronic Kidney Disease of unknown aetiology (CKDu) is highly prevalent in Sri Lanka. It is majorly occurring in agriculture workers and do not exhibit any common causative factors such as hypertension, diabetes or other known etiologies. The study was to determine the prevalence of CKDu following WHO study group guidelines in kidney disease emerging locations of Hambantota district [Angunakolapelessa (EL1) and Bandagiriya (EL2)] and non-endemic locations Matara (CM) and Nuwara Eliya (CN) in Sri Lanka. Further, the study aimed to determine the levels of tubular injury markers kidney injury molecule (KIM-1) and neutrophil gelatinase-associated lipocalin (NGAL) in the same study populations to assess potential early renal injury among CKDu subjects and healthy farmers from the selected locations.

Methods: Male farmers (n = 1734) were recruited from four farming regions in Sri Lanka i.e. CM and CN (farming locations with no CKDu prevalence) and two CKDu emerging locations from Hambantota district i.e. EL1 and EL2. Albuminuria (ACR ≥ 30mg/g); serum creatinine based estimation of glomerular filtration rate (eGFR); HbA1c; hypertension; creatinine normalized urinary KIM-1 and NGAL were measured using ELISA. Statistical analysis was performed using IBM statistics (v23). In all analysis, p<0.05 was considered as significant.

Results: Fourteen new CKDu cases (18 %) from EL1 and nine CKDu cases (9%) from EL2 were recognized for the first time from Hambantota District. Persistent albuminuria (ACR ≥ 30mg/g) was reported in new cases. No CKDu cases were identified in non-endemic study locations in CM and CN. Analysis of urinary biomarkers showed urinary KIM-1 and NGAL were significantly higher in new CKDu cases in EL1 and EL2. However, we also reported significantly higher levels of KIM-1 but not NGAL in apparently healthy farmers from EL1 and EL2 with comparison to both non-endemic control groups (P < 0.05). This may indicate the possible early proximal tubule damage even in the absence of persistent albuminuria. Our findings demonstrate the potential capabilities of urinary KIM-1 and NGAL in early prediction of renal injury among CKDu affected/emerging farming communities in Sri Lanka.

Conclusion: In conclusion, this study reported 23 new CKDu cases for the first time in Hambantota district, Sri Lanka regardless stating it as non-endemic location by WHO study group in the recent past. Furthermore, current study reported that the tubular damage predicted by urinary KIM-1 and NGAL were significantly correlated with high urinary ACR levels. Early tubular damage as seen by higher urinary KIM-1 and NGAL was also observed in healthy farmers despite normal ACR levels. However, longitudinal cohort studies are needed to predict the use of tubular markers for precise prognosis, optimized treatment and patient management.

Acknowledgement: This project was funded by RU/TURIS/PhD/02.
Poster Abstracts

Vomiting

![Vomiting Graph]

- Before Treatment - vomiting none
- Before Treatment - vomiting mild
- Before Treatment - vomiting severe
- After Treatment - vomiting none
- After Treatment - vomiting mild
- After Treatment - vomiting severe

Nausea

![Nausea Graph]

- Before Treatment - nausea none
- Before Treatment - nausea mild
- Before Treatment - nausea severe
- After Treatment - nausea none
- After Treatment - nausea mild
- After Treatment - nausea severe

Figure 1

Figure 2
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Efficacy and Safety in Management of Paracetamol Poisoning Treated with N-Acetyl Cysteine in an Emergency Department 23-Hours Observation Unit: A Comparison to Standard Inpatient Care

Kuan Kaibin Kelvin, HH Tan, HC Lim, G Arciaga, PL Goh, RP Mong

Objective: Our Emergency department started protocols for poisoning in 2012 in the 23-hours Short Stay Unit (SSU). Patients with Paracetamol poisoning could since be admitted and treated with NAC as indicated. The objective of the study is to evaluate the impact of the established SSU protocol in managing patients with Paracetamol poisoning requiring NAC treatment in our hospital. We hypothesize that such patients can be managed safely in SSU without significant adverse outcome and that a 25% reduction in length of stay can be achieved.

Methods: Patients admitted to the hospital and SSU with ICD code 965 for year 2011 and 2014 were traced. We included those with Paracetamol poisoning who were treated with NAC for >20hrs. Patients excluded from the analysis were those who did not need NAC treatment or were started on NAC but did not complete or require the standard 20-21 hour treatment. Patients with liver injury (PSS>1) at presentation or had clinical or social reasons that were deemed not suitable for SSU admission were also excluded. Inappropriate NAC use is defined as treatment with NAC when there is no biochemical or clinical indications for treatment.

Data was collected for a descriptive comparative study between patients admitted to the Ward and SSU. Patient outcome, length of stay and NAC overuse was also reviewed and analyzed. Statistical analyses were performed using data analytic software on graphpad.com.

Results: There were a total of 81 patients included in the study, 58 admitted to the ward and 23 to SSU. The basic epidemiological data were similar in both groups, including adverse reaction.
Poster Abstracts

There was no significant difference with regards to patient outcome, but with regards to average length of stay, there was a significantly shorter duration for SSU (25.6 hours) compared to the ward (48.4 hours) (P < 0.0001) (47% reduction). Inappropriate NAC use was also reduced in the SSU group by 75% (P <0.0001).

**Conclusion:** Base on this study, our findings show that managing patients with Paracetamol poisoning requiring standard NAC treatment can be managed safely in SSU without significant adverse outcome, while reducing length of stay and inappropriate NAC use. Further research may quantify actual cost savings in the use of SSU for paracetamol poisoning.
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HYPOTENSION AND MODERATE HYPOTHERMIA CAUSED BY BENZODIAZAPINE

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Introduction: The severe manifestations of benzodiazapines (BZDs) poisoning are central nervous system and respiratory system depression. Most clinical studies report serious hypothermia complicating by BZDs appear to occur in the context of intentional or inadvertent overdose. Herein we report a case of profound hypothermia associated with use of clonazapem and alprazolam for the treatment of insomnia and anxiety in therapeutic doses.

Case Report: This 56 year-old male with a history of end-stage renal disease and cerebral vascular disease was brought to the emergency department after being found unresponsive. Information obtained from his family indicated the patient was well until several days prior to presentation when he started to consume clonazapem and alprazolam. On presentation, vital signs were notable for moderate hypothermia (30°C) and systolic blood pressure around 70-80 mmHg. An electrocardiogram revealed an Osborn wave (Figure). The patient was unresponsive to the treatment of rewarming measures, such heating lamp and heating blankets. We tried flumazenil and he was returned dramatically to a normal state of body temperature, blood pressure and consciousness.

Discussion: Thermoregulation is the complex physiologic process. Lots of studies suggest the participation of GABA in the processes of thermoregulation. Clonazapem and alprazolam act by binding to the benzodiazepine site of the GABA receptors. Hypothermia induced by BZDs suggest involvement of GABA. Flumazenil, a benzodiazepine receptor blocker, completely block the action of BZDs on body temperature.
THE SIGNIFICANCE OF ANGIOTENSIN II RECEPTOR BLOCKER OR ANGIOTENSIN CONVERTING ENZYME INHIBITOR USE IN SUDDEN CARDIAC DEATH

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Objectives: Angiotensin converting enzyme inhibitors (ACE inhibitors) and angiotensin II receptor blockers (ARB) are agents widely used for hypertension and heart disease. As inhibitors of the renin angiotensin aldosterone system, they may cause hyperkalemia. In the present study, we investigate the relationship between ACE inhibitor or ARB use and hyperkalemia in patients diagnosed with sudden cardiac death.

Methods: We looked into oral ACE inhibitor or ARB administration among cardiopulmonary arrest patients brought in by ambulance to our facility during the four-year period from January 2012 to December 2015 where the cause of death was determined to be sudden cardiac death despite temporary return of spontaneous circulation after starting cardiopulmonary resuscitation. Subjects were dichotomized into those taking an ACE inhibitor or ARB and those not taking an ACE inhibitor or ARB. Variables determined retrospectively included: serum potassium, estimated glomerular filtration rate as an index of kidney function and time duration from cardiopulmonary arrest to return of spontaneous circulation. The Mann-Whitney U-test was used to compare continuous data between groups. The results are expressed as median plus range. Statistical significance was considered p<0.05.

Results: Twenty-eight patients met inclusion criteria. Mean age was 81 years (range, 35-93 years). There were 20 males and 8 females. Eight subjects were ACE inhibitor or ARB users; 20 subjects were nonusers. The serum potassium level was significantly higher in ACE inhibitor or ARB users than in nonusers (median, 6.7mEq/L (range, 4.5-10.0) vs. 5.3mEq/L (range, 3.6-8.3); P=0.028). The estimated glomerular filtration rate was significantly lower in ACE inhibitor or ARB users than in nonusers (median, 24.1 mL/min/1.73 m² (range, 5.0-57.3) vs. 46.9 mL/min/1.73 m² (range, 3.8-97.1); P=0.033). The two groups had no significant difference in time duration from cardiopulmonary arrest to return of spontaneous circulation (median, 34.5 minutes (range, 17-45) vs. 40.0 minutes (range, 10-87); P=0.219).

Conclusion: It is possible that hyperkalemia induced by ACE inhibitor or ARB use is a cause of sudden cardiac death especially in the patients with chronic kidney disease. Further case studies are needed to elucidate this relationship.
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VOMITING ASSOCIATED WITH ACUTE PARACETAMOL POISONING AND TREATMENT WITH PARACETAMOL ANTIDOTES

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Objective: This study was carried out to evaluate incidence of vomiting associated with paracetamol poisoning and treatment with oral methionine (4 doses of 2.5g q4h) or intravenous N acetylcysteine (iv NAC) 300mg/kg over 20 hours.

Method: This was a prospective consecutive case series of acute paracetamol poisoning presenting between February 2016 and July 2016 to the Toxicology unit, Teaching Hospital Peradeniya, Sri Lanka. The choice of treatment was made by the admitting medical officer. The decision to treat was based on the history of ingestion of more than 200mg/kg. Paracetamol levels were only measured later and expressed as a percentage of the treatment threshold concentration on the paracetamol nomogram. Episodes of vomiting were recorded from prehospital history and routine patient interviews. Nausea was reported on a visual scale. Nausea and vomiting was then graded using a previously validated scoring system (PONV). Patients with persistent nausea and vomiting were given intravenous fluid replacement and antiemetics. The influence of the extent of paracetamol exposure and antidote use on PONV was estimated. We compared the adverse events from the two antidotes.

Results: There were 84 patients (77% female) with acute paracetamol overdose. No patients developed liver failure or renal Impairment. Median age was 20 years (IQR 17-25). One third of (26/84) patients were above the 150 mg/L nomogram treatment line (15 were above the old 200mg/L line). This group had ingested a median dose of 24, 500mg tablets (IQR 15-39). From the total sample, 24 (29%) were treated with NAC, 17(20%) were treated with methionine and 45 (54%) were not treated with any antidote. Following paracetamol ingestion, vomiting was strongly associated with higher paracetamol concentration (p=0.029). The vomiting and nausea before and after treatment is shown in the figure 1 and 2. However, there was no significant difference in vomiting between those receiving methionine or NAC (p>0.05).

Conclusion: Nausea and vomiting in paracetamol poisoning is associated with higher exposure to paracetamol but not the type of antidote administered.
COLCHICINES POISONING DURING 7 YEARS STUDY, IN A REFERRAL ACADEMIC CENTER IN TEHRAN-IRAN

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OBJECTIVE: Colchicine is a naturall- alkaloid that has been used for centuries as a medicine for prevention and treatment of diseases such as gout, familial Mediterranean fever. It has a narrow therapeutic index so there is narrow index between the amounts of non-toxic and toxic or fatal

Methods: In a retrospective study which was done on the files of all poisoned patients with colchicines who were admitted in loghman Hakim poison center between march 2007 to February 2014, and all data was gathered according to the documented information. After that the follow up process was done by one of our internal medicine residents and if the contact was available follow up test were done too.( since march 2015 to may 2015) All data were analyzed by social package for statistical analysis (SPSS) software version 18.

RESULTS: During this 7 years period of time, Total 21 cases were admitted by diagnosis of colchicines poisoning from whom 13 patient were women (61.9%) and 8 case were male.(38.1%) Mortality rate among the patients was 3 of 21 equal to 14.2%.

The mean age of patients was 25 ± 13 years old with maximum and minimum age of 7 to 68 years old. The diseased age was less as 22 ± 14 years comparing to survived age with 26 ± 13.

Of 18 cases who had clear ethiology of poisoning ,16 case (88.9%)were suicidal. The mean dose of ingestion was 21±30 milligrams(mg) which was apparently different in survived cases 23±30 mg and in diseased patients 33±11 mg. From the point of clinical presentation ,vomiting was positive in 5/90%of all cases and diarrhea was seen in 9 cases. (9/42%) Deceasing of consciousness were found in one case and bleeding was detected in 2 patient who were both expired. Intubation and mechanical ventilation was done in 4 cases.(19%) The mean time since ingestion to hospital arrival was 17.1 hours in survived cases but 3.5 hours in deceased patients.According to laboratory tests ,rise of leukocytes ,Creatinine ,CPK ,LDH ,AST and Alkaline phosphatase was higher in deceased patients comparing to survived cases. On the other hand lower hemoglobin concentration , and platelet count was detected in expired patients. In follow up test which was done in 8 available patients, all lab tests were within normal limits.

Conclusion: Supportive care is the mainstay of ideal treatment. Although Prescribing GCSF has its valuable role in some situations. Noticing metabolic acidosis and correction of this condition has been advised strictly.
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Introduction: Ifosfamide is an alkylating agent used in the treatment of several neoplasias. One of the side effects associated with the use of ifosfamide is ifosfamide-induced encephalopathy (IIE), which can resolve spontaneously within 48 to 72 hours if discontinue ifosfamide. There have been some reports of patients with IIE being successfully treated with methylene blue (MB).

Objective: To report the effective treatment of methylene blue in ifosfamide induced encephalopathy. Methods: A retrospective chart review in patients with IIE whom treated with methylene blue in Ramathibodi hospital between 2014 to 2016.

Results: There were 4 patients (age 41 to 58 years) with neoplasia whom treated with ifosfamide in dosages ranging from 1.5 to 2 g m⁻² in 2 to 4 hours infusion rate combination with Mesna 100% of the daily dose of ifosfamide. All of them had IIE since the first ifosfamide cycle. They developed National Cancer Institute-Common Toxicity Criteria (NCI-CTC) neurotoxicity grade 2 or higher within 3 to 4 days of ifosfamide treatment. The risk factor for IIE which found in all cases was hypoalbuminemia (serum albumin 11.8 to 28.2 g/L). Renal tubular acidosis occurred in all patients, one received hemodialysis. Baseline serum creatinine was normal (0.69 to 1.08 mg/dL) prior the beginning of ifosfamide treatment. Two patients were treated with 4 doses of 50 mg MB intravenously, the others were treated with 6 doses, and 8 doses. Thiamine was given in all patients in variable dosage, a total intravenous dose ranged from 800 to 2100 mg. The patients were recovery fully within 16, 18, 24 and 33 hours after the first dose of MB treatment. None of them received prophylactic treatment with neither thiamine nor MB prior ifosfamide infusion. After IIE had occurred all of the patients were changed the regimen of chemotherapy treatment, so we have no data about the benefit of MB prophylaxis for IIE.

Conclusion: Methylene blue is an effective treatment for ifosfamide-induced encephalopathy, and may shortening the recovery time of encephalopathy.
THE VALIDATION OF ASPARTATE AND ALANINE AMINOTRANSFERASE FOR PREDICTING HEPATOTOXICITY FROM ACUTE PARACETAMOL OVERDOSE

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Objective
Paracetamol overdose is a common reason for emergency room visits and mainly causing for liver injury. The purpose of this study is to validate of aspartate (AST) and alanine aminotransferase (ALT) for predicting hepatotoxicity from acute paracetamol overdose.

Method
We conducted a retrospective observational study of medical records in patients who were admitted for treatment of acute paracetamol overdose in Siriraj hospital during January 2003 to December 2008. All of the patients had paracetamol level above 150-treatment line. All of the patients had completed N-acetylcysteine (NAC) regimen and checked for liver function test before given NAC and followed until discharge. Abnormal liver function test in female was defined by serum AST>32 U/L or serum ALT>33 U/L. Abnormal liver function test in male was defined by serum AST>40 U/L or serum ALT>41 U/L. We followed for the outcomes of acute liver injury and hepatotoxicity. Acute liver injury was defined by serum ALT≥150 U/L and hepatotoxicity was defined by serum ALT≥1,000 U/L.

Result
From 458 patients, 114 were included in this study. Hepatotoxicity occurred 12.3%. Acute liver injury occurred 43%. There was not a statistically relationship between hepatotoxicity or acute liver injury and age, sex, weight or underlying disease. Only abnormal serum AST and ALT had statistically relationship between hepatotoxicity or acute liver injury; p value<0.01. For hepatotoxicity, AST had 0.714(0.454-0.883) sensitivity, 0.84(0.756-0.899) specificity, 0.385(0.224-0.575) positive predictive value (PPV) and 0.955(0.889-0.982) negative predictive value (NPV). For hepatotoxicity, ALT had 0.714(0.454-0.883) sensitivity, 0.86(0.779-0.915) specificity, 0.417(0.454-0.883) PPV, 0.956(0.891-0.983) NPV. For acute liver injury, AST had 0.429(0.3-0.567) sensitivity, 0.923(0.832-0.967) specificity, 0.808(0.621-0.915) PPV and 0.682(0.579-0.77) NPV. For acute liver injury, ALT had 0.347(0.229-0.487) sensitivity, 0.892(0.794-0.947) specificity, 0.708(0.508-0.851) PPV and 0.644(0.542-0.736) NPV. The area under ROC curve values for predicting hepatotoxicity showed no statistical significance (0.850 for AST vs 0.823 for ALT; p=0.513). The area under ROC curve values for predicting acute liver injury showed no statistical significance (0.731 for AST vs 0.674 for ALT; p=0.057)

Conclusion
AST and ALT had no statistically difference in predicting hepatotoxicity or acute liver injury from acute paracetamol overdose. AST and ALT had a high NPV for predicting hepatotoxicity from acute paracetamol overdose.
THE INCREASING PREVALENCE OF PREGABALIN IN OVERDOSE: CHARACTERISTICS AND CLINICAL EFFECTS

RYAN, NM 1, PAGE, CP 1, 2, 3, ISBISTER, GK 1, 2.

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Objectives:
This study sought to investigate the incidence and clinical effects of pregabalin overdose.

Methods:
This was a retrospective review of pregabalin overdoses (>600mg) admitted to two tertiary toxicology units from 1st January 2012 until 31st December 2015. Demographic details, information on ingestion (dose, coingestants, reason for overdose), clinical effects, complications (consciousness, cardiovascular effects), length of stay (LOS) and intensive care unit (ICU) admission were extracted from a clinical database.

Results:

<table>
<thead>
<tr>
<th></th>
<th>Pregabalin with Coingestants</th>
<th>Pregabalin Alone</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. Patients</td>
<td>51</td>
<td>23</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>27/24</td>
<td>11/12</td>
</tr>
<tr>
<td>Age, y</td>
<td>45 (34-53)</td>
<td>40 (28-67)</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>20-65</td>
<td>19-67</td>
</tr>
<tr>
<td>Range</td>
<td>2100 (1050-4100)</td>
<td>1650 (1100-9000)</td>
</tr>
<tr>
<td>Dose, mg</td>
<td>600-16950</td>
<td>600-9000</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reason for O/D</td>
<td>45/51 (88)</td>
<td>18/23 (78)</td>
</tr>
<tr>
<td>DSP, n (%)</td>
<td>2/51 (4)</td>
<td>3/23 (13)</td>
</tr>
<tr>
<td>Unintentional/Accidental, n (%)</td>
<td>4/51 (8)</td>
<td>2/23 (9)</td>
</tr>
<tr>
<td>Recreational, n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pregabalin Own Medication?</td>
<td>40/51 (78)</td>
<td>16/23 (70)</td>
</tr>
<tr>
<td>Yes, n (%)</td>
<td>9/51 (18)</td>
<td>6/23 (26)</td>
</tr>
<tr>
<td>No, n (%)</td>
<td>2/51 (4)</td>
<td>1/23 (4)</td>
</tr>
<tr>
<td>Unknown, n (%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
While pregabalin is approved for epilepsy, generalized anxiety disorder and refractory neuropathic pain it was primarily being taken for chronic back pain (40%). Nine patients (12%) were admitted to ICU but these could be attributed to the coingestants in all cases. One of these patients had myoclonus, an uncommon but known effect of pregabalin (10.5g). One patient had two seizures after their pregabalin only overdose but had a prior history of seizures.

**Conclusion:**
This study shows that pregabalin overdose is becoming more common and is primarily being taken for chronic back pain. The more severe clinical effects appear to be associated with the coingestants rather than the pregabalin although cardiovascular effects and impaired GCS were common in all patients.
**Poster Abstracts**

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**COST EFFECTIVENESS ANALYSIS OF PARACETAMOL CONCENTRATION TEST IN PARACETAMOL OVERDOSE MANAGEMENT IN RAMATHIBODI HOSPITAL**

Sirinart Chulawongsawat, Sahaphume Srisuma, and Winai Wananukul

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**Objectives**: Serum paracetamol concentration test is not available in some hospitals in Thailand, they use the amount of ingestion by history (more than 150 mg/kg) instead. Primary objective of this study is to evaluate cost effectiveness of using paracetamol concentration to determine n-acetylcysteine (NAC) therapy. Secondary objective is to evaluate sensitivity and specificity of using the history of ingested paracetamol dose per body weight as indication for NAC therapy.

**Methods**: This is a retrospective review of acute paracetamol overdose adult patients (age more than or equal to 16 years) presented at Ramathibodi Hospital during January 2007- March 2015. The paracetamol overdose cases were identified using ICD-10. Cases with repeated doses ingestion, delay presentation after 24 hours were excluded. Amount of ingested paracetamol per body weight (mg/kg) by history, serum paracetamol concentration, treatment, and medical outcome were recorded. Cases ingested more than or equal to 150 mg/kg were defined as “NAC indicated case by history”. Cases with serum paracetamol concentration above or on the 150 line of the normogram were defined as “NAC indicated case by serum concentration”. Sensitivity, specificity, and cost effectiveness of using ingested paracetamol amount per body weight as NAC indication were determined; using NAC indication by serum paracetamol as gold standard.

**Results**: Total 41 cases were reviewed; none developed liver failure, 6 cases had severe liver injury, 9 cases had mild liver injury. NAC was indicated by history in 40 cases. NAC was indicated by serum concentration in 26 cases. There was no case with NAC indicated by serum concentration but not indicated by history. There were 14 cases with NAC were not indicated by serum concentration but indicated by history.

Sensitivity of using ingested paracetamol amount per body weight as NAC indication was 100%, specificity was 6.67%, with positive predictive value of 65%, and negative predictive value of 100%. Ingested amount by history and paracetamol concentration were not correlated (p = 0.831, by Fisher’s exact test).

In the setting of government hospitals, using serum paracetamol concentration as NAC indication can save cost of management by 853.80 Baht/person (24.4 USD/person).

**Conclusion**: Using history of ingested paracetamol amount more than or equal to 150 mg/kg as NAC indication is highly sensitive, but it is not cost effective as using paracetamol concentration above or on the 150 line of the normogram. Paracetamol concentration test is cost effective for determining NAC administration in acute paracetamol overdose cases.
THE RISK OF VEGETAMIN, DRIVE OUT THE DANGEROUS MEDICINE

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Background: Vegetamin is a combined drug of phenobarbital, promethazine and chlorpromazine manufactured and sold only in Japan. Vegetamin is an antipsychotic agent having strong sedative and hypnotic activity used to treat insomnia and anxiety with schizophrenia and depression. On the other hand, Vegetamin often causes drug dependence and has a risk of fatal respiratory depression with drug overdose and The Japanese Society of Sleep Research and Japanese Society of Mood Disorders recommended not to use Vegetamin for insomnia. Some thoughtless psychiatrists, however, prescribe Vegetamin easily according to strong demands of patients. Our purpose were to reveal the risks of Vegetamin use and background of prescription.

Method: We retrospectively identified 217 patients who transported to University of Occupational and Environmental Health, Japan by ambulance from January 1 2011 to June 30 2014. The study subjects were assigned into two groups: (I) Vegetamin over dose group and (II) non-Vegetamin overdose group.

Glasgow Coma Scale (GCS) on admission, admission rate, admission rate to the intensive care unit, and respiratory utilization was compared between these two groups. Statistical analysis was done by Mann-Whitney U-test. P values less than 0.05 were considered significant. We also analyzed the background of Vegetamin prescription.

Result: In all, 12 patients (5.5%) overdosed Vegetamin and the remaining 205 patients (94.5%) overdosed non-Vegetamin agents. The mean Glasgow Coma Scale (GCS) on admission was significantly lower in Vegetamin group than in non-vegetamin group. Admission rate to the intensive care unit, and respiratory utilization rate were significantly higher in Vegetamin group than non-Vegetamin group (p<0.05). There were two cases of death in Vegetamin group. 6 clinic prescribed Vegetamin and two of those clinic accounted for 66.7% of all Vegetamin prescription. We submitted a report of two fatal cases to the pharmaceutical company of Vegetamin.

Conclusion: The overdose of Vegetamin had very high risk of consciousness disorder and respiratory depression. Therefore, psychiatrists should refrain from Vegetamin prescription. The pharmaceutical company announced that it will stop making and selling Vegetamin in Japan because of repeated requests from emergency physician, toxicologist and common-sense psychiatrists.
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A MAN WITH PERSISTENT ERECTION FOR 5 HOURS: CASE REPORT

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Introduction: Priapism is an acute condition, which needs prompt evaluation and appropriate management to maximize erectile function outcomes. It is defined as “full or partial erection that continues more than 4 hours beyond sexual stimulation and orgasm or is unrelated to sexual stimulation.” The term priapism was derived from Greek god “Priapus”, who was worshiped as the god of fertility and had giant phallus in sculptures.

Case Report: A 49 year-old male with past history of hypertension and benign prostatic hyperplasia was sent to emergency department due to persistent erection for 5 hours. Progressive pain with fullness over his penis disturbed his sleep. He denied viagra usage, trauma history or sexual activity before sleep, but Doxazocin was regular used due to BPH. There was no significant wound, ecchymosis or palpable mass over his penis. His vital sign was stable but tenderness and fullness over his penis were noted. Penile aspiration was arranged, and blood gas from aspiration showed pH<6.8, pCO2>115mmHg, so ischemic priapism (low flow) was suspected. His symptoms was improved after 87cc dark blood was aspirated. He was arranged discharge after 1 hour of observation.

Discussion: Ischemic priapism is the rare may cause by Medications, Sickle Cell Disease, Thalassemia, Fat emboli or Pelvic malignancy. The α-blockers are safe in the management of Lower Urinary Tract Symptoms, and the uroselective drugs that are associated with side effects infrequently. The occurrence of priapism related to this class of drugs is rare and seems to be more frequent when higher doses and non-uroselective agents are used. Despite this, patients should always be informed about this possibility and how to proceed, avoiding substantial morbidity brought by late presentations.
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ONE-DAY SURVEY OF POTENTIAL DRUG-DRUG INTERACTIONS IN INTERNAL MEDICINE WARDS IN A TERTIARY–CARE HOSPITAL

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Objectives: To study the prevalence of drug-drug interactions (DDIs) in internal medicine wards in a tertiary-care hospital

Methods: A one-day cross-sectional survey of medication given in the four major internal medicine wards (ward A, B, C and D) of King Chulalongkorn Memorial Hospital (KCMH), a tertiary-care hospital with 1,200 beds. The demographic data were collected together with the comprehensive details of medication of each patient. The lists of drug were analyzed by Micromedex Drug-Reax® System to detect DDIs which were categorized by severity into 4 groups. The statistics used were prevalence, chi-square, and regression analysis which were done by using SPSS® software.

Results: From 530 prescriptions for 76 patients, 37.73% of which happened to have DDIs which the incidence corresponded to the 40% incidence of DDIs in tertiary-care hospitals in central Asia and Europe. Spearman’s correlations show statistically significant increased numbers of DDIs as numbers of medications prescribed, independently of gender. The most frequent number of DDIs for a patient is 2-3, with the average and maximum of 2.59 and 12 respectively. Severe DDIs accounted for 32.89% of all interactions. Most frequently found interactions were medication affecting cardiovascular system e.g. clopidogrel-aspirin. The difference between the prevalence of DDIs comparing ours to other studies were interactions between anti-tuberculous and psychotropic agents e.g. rifampicin-isoniazid, quetiapine-trazodone. In addition, one contraindicating DDI between metoclopramide-trazodone which increases extrapyramidal reactions were ordered but finally not given to the patient.

Conclusion: Currently, patients have easier access to a number of medications, which in turn give rise to more incidences of DDIs. In KCMH, we found less incidence of DDIs compared to other hospitals, and most of which were somewhat unavoidable but predictable since they came from necessary medications to be administered together such as isoniazid and rifampicin, aspirin and clopidogrel. Anyhow, many severe interactions found in our study were preventable. Since it was a one-day study, the recorded DDIs were not really took place and the prescription with contraindicating DDI was aborted. We believe that a more thorough drug-administration circuit development would help a healthcare system deliver the safest treatment for the patients.
Objectives: A 24/7 Toxicology service was established in Changi General Hospital in November 2014. The toxicology team is comprised of toxicologists and trainees providing 24/7 phone consultation service for the hospital. The objective of this study is to describe our experience, and report and analyse the poisoning data of patients referred to Toxicology service in 2015.

Methods: A retrospective quarterly review (July to September 2015) was done for all patients referred to Toxicology service from consultation records kept in a secure database. Electronic records were traced and epidemiological and clinical data were collected and analysed. The certainty of poisoning was graded by 2 reviewers, and the severity of poisoning was graded using Poison Severity Score (PSS).

Results: A total of 88 cases were referred to the toxicology service, but 2 cases were excluded as the calls came from other hospitals. Majority of cases were referred from the Emergency Department (74%), followed by Short Stay Unit (SSU) (21%) and 3 cases from in-patient wards. Fifty-two percent were female patients, and the majority was Chinese (65%). Middle aged group (30-39 years) was the commonest, composing more than a quarter (29%) of the cases. The most common cause of poisoning was deliberate self-harm (69%) followed by accidental poisoning (17%). The most commonly implicated poison classes were analgesics (26%) and sedatives (16%); with about ninety percent (92%) having probable to definite certainty of poisoning. About 73% of cases have mild poisoning with a PSS score of 0-1, while 23% had moderate to severe poisoning (PSS 2-3). Majority of the patients were managed with supportive measures, with 6% treated with decontamination and 14% with specific antidote. Seventy-one percent of patients were admitted to SSU, 10% to general wards and 6% to either ICU or high dependency wards. Majority of patients had uneventful recovery during their hospital stay. There were 3 fatalities, but only 2 of them had cause of death related to poisoning: a patient with clonazepam overdose and another with serotonin syndrome from paroxetine. The last patient had possible Sotalol poisoning but died from unrelated cause.

Conclusions: This quarterly report provided epidemiological information on poisoning patterns and their outcome for cases referred to Toxicology service in Changi General Hospital in 2015. Although most poisoning cases resulted in mild clinical effects, a small but significant number of severe acuity cases occur in this small cohort.
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SIMULATION TRAINING IN TOXICOLOGY – THE NEXT STEP IN TOXICOLOGY TRAINING IN HONG KONG?

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Background: In year 2015, there were 107 deaths related to drugs and poisons in Hong Kong\(^1\). Timely and appropriate management by well-trained emergency physicians (EP) are crucial to save lives of poisoned patients. We describe the development of toxicology training in Hong Kong and forecast on its future development.

The Drug and Poisons Information Bureau\(^2\)
Established in year 1987, under the Division of Clinical Pharmacology, the Chinese University of Hong Kong, it provided toxicology consultation service to acute care physicians. However, there was no formal clinical toxicology training until early 2000, when individual enthusiastic EP returned to United Christian Hospital (UCH) after receiving elective training in Poison Control Centres in the United States.

Toxicology Monthly Meeting\(^3\)
The initial intra-departmental toxicology meeting in UCH extended in August 2000 to regular monthly inter-departmental meeting involving interested EP from eight emergency departments. About half year later, this meeting was recognized by the Hong Kong College of Emergency Medicine (HKCEM) as formal educational activity.

Basic Clinical Toxicology course\(^3\)
First organized in year 2002, this 2-day course is now compulsory for new Emergency Medicine trainees since July 2015.

Hong Kong Poison Information Centre (HKPIC)\(^3\)
Found in year 2005, HKPIC provided 24-hour toxicology consultation service since July 2007. It now coordinates the Toxicology Monthly Meeting, organize the Basic Clinical Toxicology course and the 9-month Clinical Toxicology Certificate course for health care providers. Furthermore, HKPIC and HKCEM jointly run a quotable 1-year Diploma in Clinical Toxicology course [Dip Clin Tox (HKCEM & HKPIC)] for EP.

Hospital Authority Toxicology Services Scientific Conference
This is an annual event gathering local and foreign toxicologists for mutual knowledge sharing and update.

Clinical Toxicology Specialist\(^4\)
In April 2016, the Medical Council of Hong Kong formally accepted ‘Clinical Toxicology’ as a new
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specialty in the Specialist Register. This would be accompanied by a structured Clinical Toxicology specialist training program.

Simulation-based education (SIM) in future SIM can provide training and assessment platform for all toxicological emergencies, including rare but clinically-important conditions. SIM had been shown to associate with greater toxicological knowledge retention than lecture-based education at 3 months. Although there is not yet any Toxicology Simulation course in Hong Kong, with more SIM Educator trained by various centres, including the Hong Kong Jockey Club Innovative Learning Centre for Medicine and in the ten Hospital Authority Simulation Training Centres, SIM in toxicology is likely the next major step in toxicology education in Hong Kong.

(399 words)

(No financial interest to be declared)

Reference:
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THE EFFECT OF 2014 FOOTBALL WORLD CUP GAMES ON SELF-POISONING AND DRUG ABUSE; A PROSPECTIVE CASE-CONTROL STUDY

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Objectives: Fe´de´ration Internationale de Football Association World Cup Games (FWCG) is a major sport activity which involves many people and may affect the epidemiology of poisoning in many countries. Iran had this chance to be one of the 32 national teams in this championship in 2014. The current study was done to see the effect of SWCG on self-poisoning and drug abuse in Tehran.

Methods: A self-made questionnaire was filled by authors during their shifts for all patients who had been admitted during SWCG, a month before, and a month later. Files of hospitalized patients within similar months in the past year (2013) were retrospectively evaluated.

Results: A total of 13,036 patients were admitted during this period, of whom, 2130 (16.3%) within FWCG, 4369 (33.5%) during a month before/after and 6537 (50.1%) in similar period in 2013. Data were filled for 1299 patients (61.2% of target population) during FWCG and 2882 (26.4% of target population) patients in other periods. The female/male ratio was 1.28 and most patients were young (Mean [IQR] 27 years old [21, 34], range 12-92). While 21.7% of participants were regularly watching FWCG, 18.5% were following some specific games. In total 76.8% of family members were following FWCG. During FWCG, self-poisoning were reduced in females (88.9% vs. 93.4% of all causes of poisoning, p<0.001), and substance abuse was less common in males (22.3% vs. 28.5%, p=006). A time comparison before and after failure of Iran, showed that suicide attempt rose from 68.5% to 85.3% (p<0.001), which was significant in both females (78.9% vs. 94.7%) and males (54.3% vs. 72.3%). The rate of substance abuse were more among females before Iranian’s team elimination (5.3% vs. 1.9%, p<0.011). A subgroup analysis showed that the rate of suicide attempt were even less among females in the day of Iranian football matches (80.3% vs. 89.6%, p<0.018).

Conclusion: These results are suggestive of a possible effect of nationwide sporting events on suicidal behaviors particularly among young generation. This impact could be explained by theory of social integration. Spending time with family/friends and watching football games on TV may decrease the tendency of attempting suicide by drugs or poisons.
INTENSIVE CARE FOR POISONING PATIENTS; DO PHYSICIANS DISCRIMINATE: A PROSPECTIVE OBSERVATIONAL STUDY IN SRI LANKA

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Objectives
To detect whether physicians have a higher threshold for seeking an ICU bed for poisoning patients compared to other medical patients.
To assess the survival among medical and poisoning patients who did not receive CPR (cardiopulmonary resuscitation) prior to ICU admission
To assess the survival among medical and poisoning patients who received CPR prior to ICU admission

Methods: Prospective observational study was carried out in year 2015 at a general ICU of a secondary care hospital in Sri Lanka. Data were collected on admission to ICU. Necessity of CPR prior to ICU admission was considered as delay in seeking critical care. All the patients who admitted to the ICU from medical wards who did not need CPR within one hour of admission to ward were included. ICU admissions following poisoning were compared with that of other medical admissions. SPSS was used for statistical analysis.

Results: Out of 299 total ICU admissions, 154(51.5%) were from medical wards. 4 patients who required CPR on admission or within 1hour to the medical ward were excluded, as they do not indicate possible delay in assessing the need for critical care. Out of 150 patients, 122(81.33%) were due to other medical causes and 28(18.67%) were due to poisoning (22-Organophosphate, 5-Carbamate, 1-Proponyl). All poisoning admissions needed mechanical ventilation.
Out of 122 medical patients, 20(16.4%) had received pre-ICU CPR and in poisoning group it was 13(46.4%). Proportion of patients who required pre-ICU CPR is significantly higher in the poisoning group (chisq=11.97,df=1,p=0.00054) indicating a possible delay in assessing the need of critical care. When considering the outcome in non-pre-ICU CPR group (117), 70 out of 102 medical patients (68.6%) and 12 out of 15 poisoning patients (80%) were survived. The results were not statistically significant (chisq=0.809,df=1,p=0.368). In 33 patients who required pre-ICU CPR, survival percentages among medical and poisoning were 45% and 69.2% respectively and it was also not statistically significant. (chisq=1.868,df=1,p=0.171758).

Conclusion: The proportion of patients who required pre-ICU CPR is significantly higher in the poisoning group indicating a possible delay in seeking for an ICU bed or offering an ICU bed for poisoning patients. Survival among medical and poisoning patients is not significantly different in both the pre-ICU CPR and non-pre-ICU CPR groups and warrants non-discrimination even in the resource poor setting. Considering the acute nature of the event and the lower existence of co-morbidities compared to other medical patients, the long term survival may be even greater in the poisoning group.
DATA OF POISONING CASES IN JABODETABEK AREA, INDONESIA 2010 – 2015

Indonesia National Poison Information Center (NPIC) is a division under the National Agency for Drug and Food Control (NADFC) which actively seek and collect poisoning data and information. The purpose of this activity is to get general overview of poisoning cases in Indonesia; as consideration in decision making in controlling the poisoning cases in Indonesia; as consideration in planning activities for Communication, Information, and Education (KIE) for the prevention and controlling the poisoning cases in the society; as a data to improve preventive, curative, and rehabilitative services for hospitals and other institutions; and as a tool in determining the hospital policy direction in handling poisoning patients for hospitals and other institutions.

This activity is performed by collecting poisoning cases and incidence from 53 hospitals in Jabodetabek (Jakarta, Bogor, Depok, Tangerang, and Bekasi) area from about 2000 hospitals spread in 29 provinces in Indonesia using poisoning case report form. This report form contains 14 variables that must be filled. Data filled in the form come from emergency unit in the hospitals. The reported data from 2010 – 2015 is then compiled and processed through SPIMKer Application. SPIMKer (Sistem Pelaporan Informasi Masyarakat Keracunan) Application is an application which compile data of poisoning cases and incident in Indonesia.

Data that has been collected and processed are then presented in some variables, as followed:

1. Total of poisoning cases in Jabodetabek area year 2010-2015 is 15,708 cases, with details cases per year: 2,454 cases (2010), 2,440 cases (2011), 3,150 cases (2012), 3,582 cases (2013), 1,743 cases (2014), and 2,339 cases (2015);
2. The number of poisoning cases per area in 2010-2015 is 8,871 cases (Central Jakarta), 1,504 cases (South Jakarta), 1,470 cases (North Jakarta), 1,284 cases (East Jakarta), 1,002 cases (Tangerang), 749 cases (Depok), 424 cases (West Jakarta), 223 cases (Bogor), and 181 cases (Bekasi).
3. The number of poisoning cases by group of cases in Jabodetabek area in 2010-2015 is 3,660 cases (drug), 2,824 cases (animal), 2,360 cases (medicine), 1,844 cases (drink), 1,357 cases (pesticide), 1,305 cases (food), 1,114 cases (chemical), 893 cases (more than 1 substance), 1,114 cases (chemical), 135 cases (cosmetic), 124 cases (traditional medicine), 56 cases (pollutant), 24 cases (supplement), and 12 cases (plant);
4. The number of poisoning cases by routes of exposure in Jabodetabek area in 2010-2015 is 10,545 cases (ingestion), 2,611 cases (stings), 1,448 cases (bites), 675 cases (inhalation), 243 cases (injection), 154 cases (skin exposure), and 32 cases (eye exposure);
5. The number of poisoning cases by types of poisoning in Jabodetabek area in 2010-2015 is 9,573 cases (non accidental), 4,335 cases (accidental), 1,516 cases (allergy), 176 cases (unknown), and 108 cases (side effects of medicine);
6. The number of poisoning cases by group of age in Jabodetabek area in 2010-2015 is 6,156 cases (20-29 years), 3,292 cases (30-39 years), 2,117 cases (40-49 years), 1,716 cases (50-59 years), 890 cases (50-59 years), 850 cases (1-9 years), 366 cases (60-69 years), 148 cases (70-79 years), 146 cases (0 year), 26 cases (80-89 years), and 1 case (90-99 years);
7. The number of poisoning cases by gender in Jabodetabek area in 2010-2015 is 8,613 (woman) cases and 7,095 cases (man).

From this activity we can conclude and suggest that (1) The highest number of poisoning cases per Jabodetabek area in 2010-2015 is Central Jakarta (2) The highest number of poisoning cases by group of cases in Jabodetabek area in 2010-2015 is drug (3) The highest number of poisoning cases by routes of exposure in Jabodetabek area in 2010-2015 is ingestion (4) data collected yet describe the map of poisoning cases in Jabodetabek area, because the data just represent 14.4% of the hospitals in Jabodetabek area.