Preventing Toxic Exposures - From Evidence to Public Policy

9 December 2013

Auditorium, Level 1, Main Clinical Block and Trauma Centre
Prince of Wales Hospital, Hong Kong

第二屆華人中毒控制中心聯合會議

2nd Joint Conference of Chinese Poison Centres

Organisers

Prince of Wales Hospital Poison Treatment Centre
Hong Kong

Centre for Food and Drug Safety
Faculty of Medicine
The Chinese University of Hong Kong

PROGRAMME BOOK

Welcome message from Deputy Director of Health

First of all, I wish to congratulate the Centre for Food and Drug Safety of the Faculty of Medicine of the Chinese University of Hong Kong and the Poison Treatment Centre of the Prince of Wales Hospital on the opening of the Second Joint Conference of Chinese Poison Centres.

People in the mainland China, Taiwan and Hong Kong are increasingly interconnected and poisoning outbreaks in one place may affect other places. Fostering professional exchange of knowledge and experience and building closer collaboration between all of us will surely strengthen the efforts on prevention and control of poisoning in the region.

As poisoning is an important public health issue in Hong Kong, the Government has initiated to strengthen the capacities and facilities in prevention and control of poisoning in a multi-pronged approach. The Hong Kong Poison Control Network (HKPCN) which comprises relevant parties including the Department of Health, the Hospital Authority and other government departments and academic institutions providing toxicology services was established in April 2007 with an aim to enhance and coordinate the efforts. The main scope of services of the Network includes the provision of poison information and consultative services to health care professionals, poison treatment services, tertiary clinical toxicology laboratory services, toxicovigilance, training, risk communication and public education.

Over the past six years, we are pleased to witness that the local health care system and public health services have developed closer co-operation and integration in prevention and control of poisoning. The concerted efforts of healthcare professionals and experts from various disciplines have brought about remarkable progress in the control of poisoning locally.

I wish to congratulate the Organising Committee, the Chinese Poison Centres, speakers and chair persons for providing an excellent platform for healthcare professionals and scientists from the region to exchange views, share experience and scientific evidence, gain new insights in clinical toxicology and generate new ideas. I wish you all a successful conference and for the participants from the mainland China, Taiwan and overseas an enjoyable stay in our vibrant city.

Dr. Cindy Lai, JP
Deputy Director of Health of the Government of the Hong Kong SAR, and
Chairperson of Hong Kong Poison Control Network

Welcome message from the Chairman of the Organising Committee

On behalf of the Organising Committee and the Chinese Poison Centres in Hong Kong, Taiwan and China, I am pleased to welcome all participants attending the Second Joint Conference of Chinese Poison Centres. This Joint Conference provides an excellent opportunity for experts from Beijing, Guangdong, Shandong, Taiwan and Hong Kong and all participants to meet and discuss the roles of poison control centres and clinical toxicology teams in the management and prevention of poisonings in the region. The main theme of the Conference is "preventing toxic exposures – from evidence to public policy". The emphasis is on all aspects of prevention of poisoning and evidence-based approach to policy and practice in poison control.

Poison exposures remain a significant public health concern worldwide. The public has easy access to an increasing number of drugs and chemicals. For various reasons, occupational and other environmental exposures to hazardous substances can also occur. The complexity of the subject and the demand for immediate advice from the experts necessitate the establishment of poison control centres. These specialised, multidisciplinary units advise on, or assist with, the prevention, diagnosis and management of poisoning. To meet the primary goals of improving the care of poisoned patients, poison control and prevention, poison control centres must have sufficient funding and resources. Global experience indicates their impact on the reduction in morbidity and mortality due to poisoning. National, regional and international networking of the main clinical toxicology service providers should further enhance the poison control efforts. Clinical toxicology teams must also keep their professional knowledge and skills up to date.

We greatly appreciate the contributions from the renowned speakers, who agree to share their expertise with the participants. This Joint Conference facilitates knowledge translation and sharing of best practices among the collaborating Poison Centres and multidisciplinary teams. We must work together in the pursuit of poison prevention and control.

We wish to thank all the speakers, chair persons and participants for their contributions to the success of this Joint Conference

Prof. Thomas Y.K. Chan, BBS, JP
Chairman, Organising Committee, and
Director, Prince of Wales Hospital Poison Treatment Centre, and
Director, Centre for Food and Drug Safety
Faculty of Medicine, The Chinese University of Hong Kong

Organisers and Organising Committee

Organisers

Prince of Wales Hospital Poison Treatment Centre
Hong Kong

Centre for Food and Drug Safety
Faculty of Medicine
The Chinese University of Hong Kong

Participating Centres

Centre for Food and Drug Safety, CUHK, Hong Kong

Guangdong Poison Control Center, Guangdong Province, China

National Poison Center, Taipei, Taiwan

National Poison Control Center, China CDC

Poison Control Center Shandong Province, China

Prince of Wales Hospital Poison Treatment Centre, Hong Kong

Organising Committee

Prof. Thomas Y.K. Chan (Chairman)

Dr. Jones C.M. Chan
Dr. Hanlin Huang
Prof. Brian Tomlinson
Dr. Raymond S.M. Wong (Secretary)
Dr. Jou-Fang Deng
Dr. Chengye Sun
Dr. Jian-Fang Zou

Secretariat

Ms. Caran Chan, Prince of Wales Hospital Poison Treatment Centre

Ms. Maggie Lee, Centre for Food and Drug Safety, Faculty of Medicine, CUHK

Tel: 2632 1500, Fax: 2632 4715, E-mail: chanlk5@ha.org.hk

Website: http://pwhptc.home (HA intranet)
http://www.med.cuhk.edu.hk/cfds/

Faculty

Dr. Albert K.W. Au
Senior Medical & Health Officer (Environmental Health and Toxicology)
Non-Communicable Disease Division
Surveillance and Epidemiology Branch
Centre for Health Protection
Department of Health
The Government of the Hong Kong SAR

Dr. Jou-Fang Deng
Director
National Poison Center
Department of Medicine, Veterans General Hospital
Taipei, Taiwan, and
Past President, Asia Pacific Association of Medical Toxicology

Dr. Hanlin Huang
President, Guangdong Province Hospital for Occupational Disease Prevention and Treatment, and
Vice President, National Association for Occupational Disease, and
Director, Guangdong Poison Control Center
China

Prof. Hugh Simon H.S. Lam
Associate Professor
Department of Paediatrics, Faculty of Medicine
The Chinese University of Hong Kong

Prof. Ko-Chi Niu
Vice President, Asian-Pacific Undersea and Hyperbaric Medical Society, and
Honorary President, Chinese Society of Undersea and Hyperbaric Medicine, and
Visiting Professor, Department of Hyperbaric Oxygen Therapy
Chi Mei Medical Center
Tainan, Taiwan

Dr. Chengye Sun
Director
National Poison Control Center, and
Deputy Director
National Institute of Occupational Health and Poison Control
China CDC

Dr. Man Li Tse
Consultant
Hong Kong Poison Information Centre
Hospital Authority, Hong Kong

Dr. Jian-Fang Zou
Director
Poison Control Center, Shandong Province, China, and
Shandong Provincial Academy for Occupational Health and Occupational Disease Prevention
Shandong Academy of Medical Sciences
China

Programme

8:30 – 9:00 Registration

9:00 – 9:05 WELCOME REMARKS

Prof. Thomas Y.K. Chan, BBS, JP
Chairman, Organising Committee, and
Director, Centre for Food and Drug Safety, and
Director, Prince of Wales Hospital Poison Treatment Centre

9:05 – 9:15 GROUP PHOTOS

9:15 – 10:45 RECENT TRENDS IN POISONING AND PREVENTION STRATEGIES

Chair Persons:
Dr. Jou-Fang Deng
Dr. S.H. Liu

9:15 – 10:00 **Preparedness, Investigations and Management of Mass Poisonings**
Dr. Chengye Sun

10:00 – 10:45 **Preventing Toxic Substance Exposures in the Workplace**
Dr. Jian-Fang Zou

10:45 – 11:00 Tea Break

11:00 – 12:45 MULTIDISCIPLINARY APPROACH TO POISON CONTROL AND PREVENTION

Chair Persons:
Dr. Man Li Tse
Prof. Thomas Y.K. Chan

11:00 – 11:45 **Challenges in Managing Severe and Unusual Poisonings**
Dr. Jou-Fang Deng

11:45 – 12:15 **Toxico-Intelligence and Risk Assessment of Toxicological Hazards**

Dr. Man Li Tse

12:15 – 12:45 **Roles of the Hong Kong Poison Control Network (HKPCN) in Control of Poisoning Outbreaks**

Dr. Albert K.W. Au

12:45 – 14:00 Light Lunch

14:00 – 15:55 Environmental Toxicology and Risk Management

Chair Persons:

Prof. Charles Gomersall

Prof. Ellis K.L. Hon

14:00 – 15:00 **Role of Hyperbaric Oxygen Therapy in Carbon Monoxide Poisoning and Other Environmental Pollution Induced Poisoning**

Prof. Ko-Chi Niu

15:00 – 15:30 **Discussion on Characteristics of Public Nuisance Disease and Control Strategies**

Dr. Hanlin Huang

15:30 – 15:55 **Biomarkers of Mercury Exposures and Determinants of Susceptibility**

Prof. Hugh Simon H.S. Lam

15:55 – 16:00 Closing Remarks

Dr. Chengye Sun and Prof. Thomas Y.K. Chan

Preparedness, Investigations and Management of Mass Poisonings

Dr. Chengye Sun, National Poison Control Center, China CDC, China

突發中毒事件是最常見的突發公共衛生事件類別之一，其發生與其他類別公共事件關係密切。全國突發公共衛生事件網路直報資料表明，中毒事件發生頻繁且危害大，中毒事件數約占突發公共衛生事件總數 25%以上，中毒事件病例數約占突發公共衛生事件病例總數 15%，但中毒事件死亡病例數占突發公共衛生事件死亡病例總數 60%以上。

中國大陸地區突發中毒事件多數是其他事件併發、繼發或其他類別公共事件的衍生事件，事件主體往往是其他事件，形成的原因由以下四類事件。（1）自然災害。如 2008 年汶川地震氮肥廠洩露的氨氣造成了近千人中毒。（2）事故災難。1999 年洛陽東都商廈大火，造成的 309 人死亡均爲有毒煙霧窒息所至。（3）公共衛生事件。如 2003 年發生在遼寧、貴重等地的“豆奶中毒”事件。（4）社會安全事件。如 2002 年造成 42 人死亡、近 400 人嚴重中毒的南京特大中毒事件。

突發中毒事件有以下特點：（1）事件發生突然；（2）暴露與發病關係密切；（3）毒物暴露個體的健康影響相同或相近；（4）快速回應，早期採取恰當處置措施是成功應對各類中毒事件的關鍵；（5） 防範和減少公眾毒物暴露是應急工作重點。

針對以上問題，中國大陸地區自 2003 年起啓動了包括中毒事件應急處理的突發公共衛生事件應急機制建設，經十年努力，取得了較大的進步，多表述爲“一案三制”的成就。這些均體現在應急準備、技術研究、事件處置工作等方面。

Preventing Toxic Substance Exposures in the Workplace

Dr. Jian-Fang Zou, Poison Control Center, Shandong Province, China

Many tens of thousands of industrial chemicals can cause health problems as a result of occupational exposure. Health problems due to exposure to toxic substances cause needless human suffering and increase the cost of business. The development of program to prevent exposure is an increasingly urgent necessity.

The first step is "active strategies" which include (1)Formulating laws, regulations, standards.Then implementing, supervising and executing. (2)Strengthening chemicals management, campaigning for initiatives such as safer packaging labelling and storage of chemical products. Many data Comes from Material Safety Data Sheet (MSDS) /Chemical Safety Data Sheet(CSDS). (3)Identifying and evaluating the expose of poisoning. (4) Wearing suitable personal protective equipment(PPE). (5) Education and training individuals and groups to change attitudes, lifestyles and behaviors about poison awareness and safety practices. Educating to recognize and manage poisonings and how to give first aid after a toxic exposure by washing the skin and eyes immediately after contamination by poison.

"Secondary poisons prevention" is early detection, early diagnosis and appropriate treatment by occupational health examination using special screen method to find contraindication, suspected poisonings and suspicious toxic disease and to remove from hazardous work earlier. To prevent the exposed poison from progressing to a more serious, irreversible or chronic stage and to restore the victim to his/her former state of health.

"*Tertiary poisons prevention" is* to minimize the effects of the toxic agent, decontamination and first aid treatment, and specific antidote therapy while workers poisoning. Do diagnosis, treatment and rehabilitation to prevent death or permanent disability. Educating victims and their relatives about how to make the most of the remaining potential for healthy living, including the avoidance of unnecessary hardships, restrictions and complications.

Key Words：poison, control, workplace.

Challenges in Managing Severe and Unusual Poisonings

Dr. Jou-Fang Deng, National Poison Center, Taipei, Taiwan

The concept and practice of poison center (PC) were originated from Europe and North America. The purpose for setting up a PC is mainly for poisoning prevention and to facilitate the management of poisonings. Though, the function of PC does vary with geographic and cultural difference, it may overall contain the following activities: poison phone call consultation, poison information releasing, data-collection, public education, professional training, technical assistance in diagnosis as well as the treatment of poisonings and poisoning outbreak investigation. Under certain circumstances, it may be charged with the role of advocate for poisoning prevention when there is any poisoning outbreak with a potential of public health importance is identified. Poisoning outbreaks may involve with environmental hazards, occupational hazards as well as food hazards. Therefore, to fulfill the function and the role of PC, the PC itself does need to interact with general public, industrial workers, medical professionals, academia, governmental agents as well as the industries. When there is any happening of severe and unusual poisonings, the capacity of the function and role of a PC will be challenged. We will bring up a few outbreaks of severe and/or unusual poisonings which we have dealt with in the past 25 years for discussion.

Toxico-Intelligence and Risk Assessment of Toxicological Hazards

Dr. Man Li Tse, Hong Kong Poison Information Centre, Hospital Authority, Hong Kong

New poisonings emerge from time to time. They can cause serious negative impact on the health care system and the society as a whole. New poisoning happen typically due to two causes:
(1) New poison;
(2) New unexpected human behavior.

New substances were usually invented for industrial use, as new drugs or to be abused. In a way, they are the easy one to tackle. On the other hand, predicting human behavior can be hopeless. For example, the explosion of ketamine abuse after 2005 while the drug has been manufactured since 1965. Another example was the addition of the tasteless and zero-nutritive value substance melamine into milk products in 2008.

The Toxicointelligence team was developed to tackle the issue of new poisonings and to prepare for new outbreaks. We believe that there are always hints or signals before every outbreak, only a trained eye or eyes are needed to spot them. We believe that no outbreak is really unexpected though we acknowledge that at times their occurrence is unpreventable. That makes preparedness so important in poison control. Prevention and Preparedness are our primary objectives.

The team is made up of members from the 3 pillar units in HA Toxicology Service, namely .the Hong Kong Poison Information Centre, HA Toxicology Reference Laboratory, PWH Poison Treatment Centre together with pharmacist from the Chief Pharmacy Office with mix of emergency physicians, physicians, chemical pathologists, pharmacists and scientists. The team continuously monitors and evaluates information of possible new poisonings from various available sources worldwide. New methodology was developed for scientific evaluation. Regular team meetings are hold for in-depth assessment of the threats being considered high risk. Recommendations regarding prevention and management of such outbreaks are drafted. Monographs are developed for new poisoning threats every year. They are communicated to the relevant members and departments in HA, the Department of Health as well as other concerned government agencies. Through the work of this dedicated team, we hope to turn information into intelligence that can at best prevent or at least better prepare Hong Kong against new poisoning outbreaks in the future.

Roles of the Hong Kong Poison Control Network (HKPCN) in Control of Poisoning Outbreaks

Dr. Albert K.W. Au, Department of Health, The Government of the Hong Kong SAR

Poisoning is an important public health issue as it causes significant morbidity and mortality. Because of globalization, poisoning outbreaks in one place may have potential impact in other places. Threats to public health from poisoning incidents are continually emerging and may affect the whole population.

In the past few years, the Hong Kong Government has taken initiatives to strengthen both the hardware and software in prevention and control of poisoning using a multi-pronged approach. One milestone is the establishment of the Hong Kong Poison Control Network (HKPCN) in 2007, with an aim to enhance the infrastructure and coordination among key players taking a part in poison information service, clinical service, laboratory analytical service, toxicovigilance, professional training and research.

The HKPCN comprises units in the Hospital Authority (HA), the Department of Health (DH), relevant government departments and other stakeholders. The four key components include DH and three units under HA, namely the Hong Kong Poison Information Centre (HKPIC), the Poison Treatment Centre (PTC) and the Toxicology Reference Laboratory (TRL). DH's roles are focused on public health protection, including investigation of poisoning outbreaks, implementation of control measures to reduce exposure, risk communication, prosecution, health education and surveillance. HKPIC provides timely poison information and advice on clinical management of poisoning cases to healthcare professionals. TRL provides tertiary level laboratory service on analytical toxicology. PTC provides tertiary treatment service for poisoning patients.

Poisoning cases with public health significance and poisoning outbreaks are reported to DH for epidemiological investigation. These commonly involve Chinese herbal medicines, western drugs, oral products and slimming products adulterated with western drugs, heavy metal poisoning, etc. Effective management of poisoning outbreaks requires early detection, appropriate clinical management and timely public health actions. The success is substantially relied on concerted efforts of HA, DH, other government departments and academia. The HKPCN has provided a platform for enhanced coordination between various parties and stakeholders in management of poisoning outbreaks. Examples will be shared in the talk.

On the side of risk reduction and prevention, DH will continue to regulate Chinese medicines, proprietary Chinese medicines and western medicines through enforcement of related

legislations, such as the Chinese Medicine Ordinance, Pharmacy and Poisons Ordinance, Dangerous Drugs Ordinance, etc., strengthen publicity and education to raise public awareness, and maintain close communication with counterparts in areas outside Hong Kong especially the Mainland China.

Role of Hyperbaric Oxygen Therapy in Carbon Monoxide Poisoning and Other Environmental Pollution Induced Poisoning

Prof. Ko-Chi Niu, Chi Mei Medical Center, Taiwan

Carbon monoxide (CO) is a toxin product of the incomplete combustion of hydrocarbons that is the leading cause of death by poisoning during the winter in household using coal gas or charcoal for heating, cooking, shower bath and sometimes due to suicide tendency. CO has about 250 times greater affinity for hemoglobin than has oxygen. Moreover, it can induce catastrophic intracellular suffocation by competing with oxygen for the reduced form of cytochrome *a*3 oxidase and P-450, thus blocking respiratory chain function and the cellular energy metabolism, with the similar mechanism of toxicity by cyanide and H2S. Besides, CO poisoning may develop delayed neuropsychiatric syndrome after apparent recovery from the acute intoxication a few days up to 3 weeks after exposure, and as late as 2 years after apparent complete recovery. Hyperbaric oxygen (HBO) therapy has been considered a standard therapy for CO toxicity and smoking inhalation. We reported a series of CO poisoning cases, including a group of fire fighters suffering from smoking inhalation injured in the fire of a pharmacy and science university, who were successfully treated by HBO therapy. We experienced that an aggressive intensive care with adequate respiratory care in hyperbaric chamber is essential for the severe CO poisoning in addition to the emergent management of HBO therapy.

Discussion on Characteristics of Public Nuisance Disease and Control Strategies

Dr. Hanlin Huang, Guangdong Poison Control Center, Guangdong Province, China

環境公害病，是由人類違背客觀規律的活動造成嚴重環境污染而導致的地區性疾病，其主要特點有：1.致病因素繁多、複雜、隱匿；2.危害後果嚴重、多樣、持續、遠期和不確定性；3.危害範圍大、影響一個區域或流域；4.危害人群廣，可波及各年齡組，以脆弱人群爲重；5.發生有一定的規律性，與特定的地理環境、特殊氣候條件、人群特徵和突發事故有關；6.診斷難、治癒難；7.破壞正常生活、工作環境和秩序，影響經濟發展和社會穩定。

當前，中國的環境污染形勢十分嚴峻，嚴重環境污染事件時有發生，環境公害病正在威脅廣大人民群眾健康。然而，國人對環境公害病卻缺乏認識、缺乏系統研究，也沒有環境公害病專業防治機構。因此，必須加強環境公害病研究，探索其發生、發展規律和預防控制措施和診療技術，早期發現、早期診斷、早期干預。

建議儘快制定《環境公害病防治法》，建立環境公害病防治協調機制，創建具有中國特色的環境公害病專業防治機構，制定新的稅費政策，建立專項基金，健全中毒控制網路，以降低環境公害病危害程度，乃至消除環境公害病危害。

Biomarkers of Mercury Exposures and Determinants of Susceptibility

Prof. Hugh Simon H.S. Lam, The Chinese University of Hong Kong, Hong Kong

Although acute mercury toxicity is uncommon in Hong Kong, low-dose chronic mercury exposure is common. Methylmercury is the species of mercury that is most likely to increase the risk of adverse health outcomes in the general population. In order to determine the risks of various at-risk populations, biomarkers of mercury exposure have been investigated. Mercury concentrations can be measured in tissues such as blood, hair and urine. Other useful biomarkers of mercury exposure include cord blood and umbilical cord mercury concentrations. Different biomarkers can be employed to reflect different mercury exposure patterns. For example, cord blood mercury concentration can be used as a biomarker of fetal mercury exposure during the third trimester. In order to determine the methylmercury exposure specifically, mercury speciation techniques have been used with success.

Several factors influence the susceptibility of individuals to mercury toxicity. One important factor is body selenium status. Individuals with decreased selenium levels may be at higher risk of adverse outcomes associated with mercury exposure. Genetic factors have recently also been found to play important roles in mercury metabolism. For example, genetic polymorphisms in genes involved with pathways which play a role in the metabolism of methylmercury can lead to modification of the association between mercury intake and retention and thus modify the intake levels at which toxic levels may occur.

Judicious use and investigation of biomarkers of mercury exposure and associated genetics can potentially play an important part in the development of evidence based guidelines to diagnose, treat and manage mercury exposure at individual and government levels.

CME / CPE Accreditations

CME		
Institution	**Points**	**Category**
The Hong Kong College of Anaesthesiologists	5.17	Non-anaes
Hong Kong College of Community Medicine	5	-
Hong Kong College of Emergency Medicine	5	PP
Hong Kong College of Paediatricians	5	Cat. E
The Hong Kong College of Pathologists	5	PP
Hong Kong College of Physicians	5	-
MCHK CME Programme	5	Passive
CPE: 6 points accredited		