the diagnosis of arsenic intoxication requires detection of the arsenic directly from patient materials.

Almost none of the hospitals have equipment to detect poisons. There is the Japan Information Center, but there is not a public or a commercial poison analysis institute in Japan. Police agencies can examine poisons for solving crime, but the information may not be available in time to treat the patient because the information may be qualitative analysis data.

After the episode described in this report, the Wakayama City, the Institute of Public Health, the Center of Wakayama Prefecture Institute of Public Health and the Environmental Pollution, and the Critical Care Medical Center in Japanese Red Cross in Wakayama Medical Center will have an ICP-MS, a HPLC-MS, and a fluorescence X-ray spectrometer, respectively. These institutes are situated in different places and are closed at night except for the Japanese Red-Cross Wakayama Medical Center.

There is a need to unify these instruments and to establish a poison analysis center to be practically available for determining the treatment required for victims of poisoning.

Keywords: analysis; arsenic; detection; diagnosis; electrocardiogram; intoxication; Japan Information Center; mass spectrometers; poisoning; Red Cross

PN6-4
An Emergency Network for the Treatment of a Mass Poisoning Plot by the Japan Poison Information Center

Toshiharu Yoshioka, MD, PhD; Yohko Endoh, PhD; Hisashi Ikeuchi, MD, PhD; Takeshi Shimazu, MD, PhD
Department of Emergency Medicine, Osaka Prefectural General Hospital, and the Japan Poison Information Center, Osaka City, Japan

The risk management against the crime using poisonous substances has been revised after the crime using an arsenic acid substance in Wakayama Prefecture, because the delay of identification of the poisonous substance led to a loss of time in the provision of proper treatments. Thus, the Japan Poison Information Center (JPIC) has developed two databases (DB) that should be helpful for this type of disaster.

The two databases (DB) are the diagnosis-supporting DB and the registry DB of poison specialists. In this presentation, we will focus on the diagnostic database that will help identifying the causative substances from clinical symptoms and signs and laboratory data. The role of these DBs in the risk management of cases of poisoning also will be discussed.

The JPIC diagnostic database has enrolled approximately 100 poisonous substances, and will help identify the causative substances when such substances are used. The substances were selected based on the: 1) extent of systemic toxicity; 2) previous use in crime records from the past; and 3) availability of effective antidotes. Gaseous inhalation poisons and local corrosives are not included in this database in order to increase the accuracy of the identification. Clinical symptoms and signs finally were classified into 122 basic items, and laboratory data were grouped into 40 categories. To make the identification more accurate, it is important to collect clinical information serially from the onset, because the condition of the patients might change drastically during the acute phase.

The poison specialists registered in the database consist of professionals from clinical medicine, laboratory medicine, pathology, pharmacology, legal medicine, analytical chemistry, and so on. The database classifies them by their professional specialization for chemical substances and their respective areas of research. This will support interactive estimation of the cause by enabling bi-directional information exchange between the clinicians on the scene and the specialists in areas distant from the scene.

Once such an incident of mass poisoning plot occurs, based on clinical information from the physicians actually treating the patients, the JPIC will estimate a couple of probable causative substances from the diagnostic database. Then, the JPIC will consult with the registered specialist and will proceed with chemical analysis for the suspected substance. Prior to the arsenic poisoning in Wakayama Prefecture, there was no definite rule as to where the analysis should be made. Now, tertiary emergency medical centers, the Criminal Investigation Laboratory of Prefectural police headquarters, and the Research Institute of Public Health in local governments are equipped with analytical capabilities.

It must be made clear as to who takes control of the entire system, how to obtain all the information including clinical conditions and samples, and how to give medical information on the substance to local hospital(s). Practical procedures to cope with the mass intoxication incidents should be discussed including specialized coordinating system for chemical disaster.

Keywords: agents; analysis; arsenic; chemicals; data bases; detection; diagnosis; disaster; hospitals; identification; information; Japan Poison Information Center; mass casualties; poisons; poisoning; specialists; treatment

PN6-5
Detection and Identification of Unknown Poisonous Substances from Patient Material: The Experience of the Chemical Incident Response Service, London

Dr. Virginia Murray, MBBS, FFOM,[1]
Dr. Brian Widdop, PhD, C.Chem.FRSC[2]
1. Director, Chemical Incident Response Service
2. Director, Medical Toxicology Laboratory
Medical Toxicology Unit, Guy's and St Thomas' Hospital Trust, London, UK

Introduction: The Medical Toxicology Unit started in 1963, and currently provides the following services:
1) National Poisons Information Service, London (receives approximately 200,000 emergency case enquiries per year from medical professionals);
2) Medical Toxicology Laboratory (largest hospital-based analytical toxicology laboratory in the UK);

3) Medical Toxicology Service that takes medical referrals and admissions; and
4) Chemical Incident Response Service (CIRS) provides incident assistance with information, laboratory, and medical support

Methods: for detection of unknown poisonous substances: Clinical assessments together with biochemical and physiological data obtained from local laboratories sometimes can point to the type of chemical involved, but proper confirmation only can come from analytical work. Samples taken from the environment (air, soil, water, etc.) are the easiest to deal with, but if these are not available, then biological materials are the other alternative. Samples of blood and urine should be taken without delay, and it is vital to guard against contamination and to ensure that the correct containers are used. For a "blind screen" in adults, 10 ml of lithium-heparinised blood, 4 ml of EDTA blood, and 50 ml of unpreserved urine will suffice. Prepared sample collection kits with instructions and request forms supplied by the incident centre help. The samples must be transported to the laboratory as quickly as possible to avoid losses of chemicals during storage.

Techniques such as gas-liquid chromatography (GLC) and high performance, liquid chromatography (HPLC) cover a wide range of chemicals. Ideally, these should be linked to a mass-spectrometer that provides unequivocal analytical evidence. Mass-spectrometers are equipped with vast libraries of spectra that can be matched to those of the unknown chemical within minutes. Groups of compounds that can be detected include volatile solvents, alcohols, glycol ethers, pesticides, and drugs. For identification of toxic metals, Inductively Coupled Plasma Mass Spectrometry (TPC-MS) is the best technique, and can screen for elevated levels of over 30 elements in less than one hour.

No amount of investment in these expensive analytical instruments will bear fruit without having a team of fully trained and experienced analytical toxicologists available to undertake the assays.

Results: Since 1994, the CIRS has identified and responded to an increasing number of incidents with 937 recorded in 1998. Over the last year, incidents have led to the specialised toxicological analysis of over 2,000 biological samples, and these results have been invaluable in managing these incidents.

Conclusion: This multidisciplinary approach within CIRS apparently is a novel development. It requires close collaboration and training with the 75 Health Authorities in England who are responsible for the health of approximately 37 million people. In order to assess this system of incident response and management, links with other expert organisations nationally and internationally have been developed. These include the International Programme on Chemical Safety (WHO/ILO/UNEP) and the Agency for Toxic Substances and Disease Registry (ATSDR), USA.

Keywords: assessments; chemicals; chromatography; detection; identification; poisons; responses; sampling; spectrometry

Panel Discussion VII

The Efficacy of the Internet in Disaster Computer Programs

Wednesday, 12 May, 10:00–11:30 hours

Chair: ***Kendall Ho, I. Kamae***

PN7-1

Megacity Network: Capacity Building, Transfer and Share of Knowledge and Health Information

Saiedeh von Keitz
Center for Health Development, World Health Organization (WHO)

Health has been identified as one of the key sectors that can benefit from a national telecommunication infrastructure. Applications of high performance computing, such as TeleMedicine, for delivery of medical care and a strong capacity for telecommunication and multimedia technology is needed. In addition, the extent to which public health can achieve its mission depends largely on the effective collection, analysis, use, and communication of health and health-related information.

To get the most out of the health telematics for the developing and developed countries, building local capacities in telecommunication infrastructure in order to access health information as well as in producing, managing, and disseminating of health information is essential.

The WHO Centre for Health Development in Kobe, Japan, commenced the project of networking with Megacities, due to the fragility and complication of health situation (especially in case of natural disasters and outbreaks) in these most populous urban agglomerations. Transparency of the health infrastructure and accessibility of health information has become critical for Megacities at both national and international level. It also was WCK's concern that language has always been a barrier between nations to exchange information, data and knowledge. Therefore, WCK has decided to implement this project in English as the common language for sharing health information internationally, as well as in the local language for the benefit of the countries.

The Network of Health Institutions in Megacities, interconnects health ministries, national institutes, medical, health, nursing, and pharmaceutical schools; national hospitals and sanatoriums, universities, university hospitals, university centres and institutes, public health centres, public health research centres, general hospitals, clinical research institutes of national hospitals, associations, societies, intergovernmental and non-governmental organizations, and WHO collaborating centres.

http://megacitynetwork.who.or.jp

Keywords: capacity building; collaboration; infrastructure; knowledge, magacity network; telecommunications