

## General Sessions

### 2.1. Emergency Care

#### Natural Toxins in Our Environment

*Dr. R. Ponampalam*

Associate Consultant, Department of Emergency Medicine, Singapore General Hospital, Singapore

Singapore is a small island nation located in the Asia Pacific region. Despite its small size and urbanization, large areas of undisturbed natural land resources still remain, preserving much of the native flora and fauna of the region. Consequently, a wide diversity of envenomations from snake bites to marine stings are still encountered, but the incidence of venomous bites and stings is decreasing.

Common envenomations in Singapore result from either venomous land or marine creatures and, generally, pose medical problems through envenomation; allergic reactions or anaphylaxis; physical trauma; retained foreign body; and/or vectors for disease causing organisms.

Envenomation, or the intoxication of an individual by the toxic effects of the venom, can manifest with local or systemic effects. Local effects include itching, irritation, redness, swelling, warmth, and even necrosis as a result of tissue toxins. Systemic effects may involve specific target organs, such as the nervous system for the cobra venom, or, more commonly, multiorgan systems due to the diversity of toxins in the venom.

Wasps and bees are the most common venomous organism encountered in Singapore. This is compounded by the fact that Singapore has a citizen's army, thus bringing a large portion of the population to an exposure risk while outdoors. Despite this, there have been no fatalities due to wasp and bee stings in the last five years, partly due to the success of the desensitization of bee-venom hypersensitive individuals.

Centipedes thrive in the hot humid environment in Singapore and it is not uncommon to see centipedes that are 10 to 15 cm long. Majority of these bites tend to occur in the lower extremities and the effects of the toxin only are local. The stings of two venomous species of scorpions—the spotted house scorpion (*Isometrus maculatus*), the smallest and most venomous of the two, and the black scorpion (*Heterometrus longimanus*) have produced no fatalities.

Although spiders commonly are encountered in the home and work environment, spider bites rarely cause significant morbidity. Ticks occur amongst cats and dogs locally, but rarely occur in a human host. Amongst the few cases of human bites, none have been associated with paralysis or tick-borne diseases such as Lyme disease.

Many species of snakes are found in Singapore thrive in both their natural habitats as well as in developed areas. Most species are nonvenomous, and many of the venous bites are dry bites with no significant envenomation. Usually only one significant envenomation per year occurs, usually among workers from the zoo. Besides supportive

care, a polyvalent antivenom that covers the locally venomous species also is given. At present, research and development of ELIZA diagnostic kits for the locally venomous snakes bites are underway.

The Portuguese man-of-war and the sea wasp (Box jellyfish) are endemic in the surrounding waters and among the venomous marine creatures found in Singapore. Stings are common and mainly manifest as local reactions that tend to persist for the long term as neuroectodermatitis at the sting site. No fatalities have occurred so far, but significant morbidity from gut ileus has been encountered. Stings from sea anemone, corals, sea urchins, and cone shells occasionally are encountered, but mainly produce only local reactions.

Stonefish stings to the feet are extremely. No systemic effects have been encountered so far and antivenin is not given due to its unavailability locally. Stings from lionfish that are kept as pets in home aquariums occasionally are encountered. This and catfish stings occur less frequently due to the better awareness of the persons handling these fishes.

Management of venous stings and bites is problematic because often the offending organism is not identified. First aid measures include assessing and stabilizing the ABCs; reassuring the casualty; evacuating quickly to a hospital; immobilizing the affected extremity and place it in a dependent position; lymphatic constriction band for snake bites, if evacuation is delayed; wound management to include: a) control of bleeding; b) wound toilet; c) sterile dressing; d) if stinger is present, careful removal; e) cold compress to reduce swelling; and f) for marine stings, immerse affected site in warm (42° C) water until pain subsides. Application of baking soda and vinegar may be useful.

In addition to the above supportive measures, regular assessment of patients with regard to signs, symptoms, or lab tests that suggest significant envenomation requiring antivenom is recommended. Patients should be started on tetanus prophylaxis, analgesics, and antibiotics as required.

**Keywords:** bites; insects; Singapore; snakes; stings; toxins; venom

*Prehosp Disast Med* 2001;16(3):S109.

#### Hospital Authority HAZMAT Incident Contingency Plan

*Dr. Jimmy Chan, MB, BS(HK), FRCS(Edin), FCSHK, FHKCEM, FHKAM(Surgery), FHKAM (Emergency Medicine), FFAEM AD EUNDEM*

Head of Emergency Department, Alice Ho Miu Ling Nethersole Hospital, Hong Kong Hospital Authority, Hong Kong

A HAZMAT incident is defined as an accident that involves contamination of victim(s) by toxic chemical, biological, or radiological agents. The risk of mass exposure to toxic substances has increased steadily during the twentieth century due to the expansion of industry, and the result of deliberate development and use of toxic weapons of war-

fare. Incidents caused by chemical agents are far more common than are biological and radiological agents. Factories, laboratories, farms, suicidal cases involving chemicals, and vehicles transporting chemicals and terrorism are potential sources of HAZMAT incidents.

Hong Kong Hospital Authority (HA) will provide consultations to the Hong Kong Special Administrative Region (HKSAR) about the medical management of HAZMAT incidents. In addition, to ensure an adequate supply of antidotes, the HA will cooperate with other agencies and all emergency departments in Hong Kong to deal with HAZMAT incidents. Since contaminated victims may arrive at hospital by their own transports, emergency departments should be prepared to decontaminate victims using at least Level C Personal Protective Equipment (PPE). In order to achieve the above objectives, each emergency department should acquire decontamination facilities, PPE, adequate stock of antidotes, and an updated database of hazardous material. Drills for HAZMAT incidents should be conducted at regular intervals.

Chemical incidents are uncommon. If one occurs, it will cause a major threat to the health of staff working in hospital. Medical preparedness is essential for effective treatment of victims and the protection of staff against chemical contamination.

**Keywords:** agents; chemical; contaminated; decontaminated; hazardous materials, HAZMAT; Hong Kong  
*Prehosp Disast Med* 2001;16(3):S109-110.

### Management of Nerve Gas Casualties

**Prof. Foroutan, Seyed Abbas**

Assistant Professor and Head of Disaster Medicine Department, Medical School, Shaheed Beheshti University of Medical Sciences, Iran

In the post-World War I era, the chemical warfare of Iraq against Iran is unique in various dimensions. From December 1980 to June 1983, there were experiments and military maneuvers and drills. From July 1983 to January 1984, there occurred localized and limited Iraqi chemical attacks carried out using mustard gas. From February 1984 until the end of war (1988), mustard and nerve agents were used on a large scale.

On 17 March, 1984, the first nerve gas, "tabun", was used against Iranians. Then, Iraq began to use sarin, and finally, a mixture of sarin+GF until the end of war.

Iranian cities on the western provinces and border villages had been the site of continuous chemical attacks by Iraq during March 1988. Both mustard and nerve gases were employed, but the role of nerve gas was more significant. On 17 March 1988, the city of Halabja, in the north-eastern part of Iraq, was the site of a huge Iraqi chemical attack. People from this city and satellite villages were bombarded especially by nerve gas. Many Iranian villages, especially in the regions near Marivan city, were heavily bombarded by mustard and nerve gas.

The existence of a chain service system for treatment of chemical casualties drastically decreased the mortality and morbidity rate. Treatment used a practical triage system for

nerve agent victims and administration of atropine, oxime, and diazepam.

Critical in the field emergency was administering the highest possible dose of atropine in the shortest period of time.

**Keywords:** atropine; chain service system; chemical; diazepam; Iran; Iraq; mustard gas; oxime; sarin; tabun; war-fare.

*Prehosp Disast Med* 2001;16(3):S110.

### Stress in Emergency Health Care Providers

**Dr. Angelina Chan**

Senior Consultant, Institute of Mental Health, Singapore

Emergency Medical Service (EMS) is a particularly high stress field, working not only with the acutely sick and injured, but also in emotionally charged and, at times, dangerous physical environments. Increasing utilization of the EMS increase the risk of occupational stress and injury to EMS personnel.

Evidence exists suggesting that this particular group of health care workers are experiencing cumulative exposure to line-of-duty trauma, e.g., managing severely injured, dead, and dying victims, which may lead, not only to stress and burnout, but also to other forms of mental health problems. Hence, it is important to understand critical incident stress and the other associated types of psychological distress that may arise in this profession. Various risk factors, currently available interventions, and self-care are discussed.

**Keywords:** critical incident stress; emergency medical services; EMS; psychological distress; stress

*Prehosp Disast Med* 2001;16(3):S110.

## 2.2. Prehospital Care: Air, Land, and Sea Operations

### Another Type of Flying Doctor

**Dr. Roger W. Farrow, BSc, MB, ChB, Dip OBST, Dip Av MED (RCP Lond), DTMSH, (Liverpool), FAF-PHM**

Deputy Group Medical Director, International SOS, Singapore

The world's commercial airlines have expanded dramatically in the past decade. The opening of new tourist destinations and the increase in tourist numbers have encouraged airlines to look at larger aircraft able to carry greater passenger loads over longer distances. The next generation of aircraft will be able to carry >500 people in a double-deck configuration.

At any one time, there are many hundreds of thousands of people flying. Many travelers today are elderly and a significant proportion have existing medical problems. The airlines dilemma is what to do should a passenger become ill on a flight. There are only two options, continue to the