General Sessions
2.1. Emergency Care

Natural Toxins in Our Environment

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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 nonvenoumous, 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 Portugese 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.

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Hospital Authority HAZMAT Incident Contingency Plan

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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-