



WHO COORDINATION MEETING ON VENOMS AND ANTIVENOMS

A WHO informal meeting took place at the Chemika Zurich from 24 to 27 September 1979. The purpose of the meeting was to coordinate the work in progress throughout the world on the use and standardization of venoms and antivenoms. The list of the participants is shown in Annex I and the agenda in Annex II.

For many years WHO has had an interest in the treatment of bites and stings from poisonous creatures and although there have been informal meetings from time to time none has specifically attempted to collect the data of the clinical effects of snake and scorpion bites and stings and the experiences in their treatment. Furthermore it was recognized that there is an urgent need to correlate such experiences with the laboratory tests being applied to the antivenoms in attempts to measure the potency of these materials. One important advance that could be made in such standardization is the availability of venoms that had been fully characterized and the establishment of international standard antivenoms.

WHO has taken the first step in designating the Liverpool School of Tropical Diseases as the WHO Collaborative Centre for the Control of Antivenoms. As Director of this Centre, Dr H. Alistair Reid agreed to be Chairman of the meeting.

The meeting agreed that in English 'venom' and 'antivenom' were the preferred names rather than venin/antivenin or venene/antivenene.

A. EPIDEMIOLOGY

Incidence and mortality of snake bites, scorpion stings and spider bites

Injuries and death due to snake and spider bites as well as scorpion stings occur in most parts of the world, and especially in the tropics where they may represent a major health problem. Unfortunately, knowledge of their epidemiology is fragmentary due mainly to the lack of reliable statistical data.

In the United States of America, approximately 8000 bites by venomous snakes are reported each year. There are about 12 deaths which occur in the untreated, under-treated, or mistreated children or in members of snake-handling cults. Approximately 1000 scorpion stings are reported each year; the last death was in 1968. About 3000 spider bites (usually Latrodectus or Loxosceles sp) occur each year. Marine animal stings range into several hundred thousand each year but deaths are extremely rare.

Scorpion stings are a major health problem in Mexico where there are an estimated 300 000 cases each year, with about 1000 deaths. Scorpion stings are also important in Trinidad and South America. Spider bites are mainly common in South America and Australia.

In Costa Rica, hospital admissions for snake bite have been estimated as 22.4 per 100 000 population per year, with 5 deaths per 100 000 (mostly due to bites by Bothrops atrox). In South America 90% of snake bites are caused by Bothrops species. Mortality has been estimated as 2.4% but may be as high as 8% when no antivenom is given. After rattlesnake bites (Crotalus durissus terrificus) about 74% of the untreated victims die but in patients receiving antivenom, mortality falls to 12%.

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In North Africa, scorpion stings are medically more important than snake bites. For example, in parts of southern Libya during 1979 there were 874 scorpion stings per 100,000 population and 7 deaths per 100,000 (most deaths being in children under 2 years old). In mid-Africa, the incidence of snake bite has been greatly underestimated. In savannah regions of West Africa, the carpet viper (Echis carinatus) is the most important cause of snake bite morbidity and mortality. In one area in north-eastern Nigeria there are about 120 bites and 8 deaths per 100,000 population each year; in northern Ghana the incidence of bites is 86 per 100,000 with 24 deaths per 100,000.

In Europe snake bite is relatively rare. Only 14 deaths due to adder bites (Vipera berus) have occurred in Britain during the last 100 years. In England and Wales only one death from adder bite was recorded in 1950-72, but there were 61 deaths from bee or wasp stings. The last adder bite death in Germany was in 1959. In Finland there were 21 deaths from adder bite during 1936-1960, and an incidence of 163 proven bites during the summer of 1961. In Europe bites by imported venomous snakes are sometimes fatal.

In South East Asia, over 10,000 deaths due to snake bite are reported annually (see Annex III). The mortality is high in India, Sri Lanka, Burma, Thailand and the Philippines; in the Maharashtra state of India more than 1000 deaths per year due to snake bite have been recorded.

In Australia about 3000 suspected cases of snake bite are reported each year and 600 victims are treated with antivenom. Between 5 to 14 patients used to die each year but recently the mortality rate has fallen due to better treatment.

The participants agreed that the use of immunodiagnostic methods for assessing venom antigen and antibody, and collaboration with anthropologists and traditional healers should greatly improve the epidemiological data on venomous bites and stings. It was recommended that the data should be reported using the classification recently adopted by WHO.

B. MEDICALLY IMPORTANT SPECIES

Medically important snakes are listed in Annex IV. The list is not definitive; it is compiled from published medical reports of bites by identified species. Scorpions of importance include species of Centruroides (Mexico, North and Central Americas), Tityus (South America), Androctonus, Buthus, and Laelurus (North Africa, to South-East Asia). The spider Latrodectus sp. occurs in warm areas throughout the world. Loxosceles sp. can cause severe necrosis (mainly in the Americas). Spiders of Phoneutria sp. and Atrax sp. are medically important in South America and Australia respectively.

C. CLINICALLY IMPORTANT FEATURES OF ENVENOMING

C.1 Systemic envenoming

Snake bite envenoming produces changes which, specifically, may not be systemic or local and it is important for the clinician to assess all symptoms and signs, both local and systemic, in determining suitable treatment. In crotalid venom poisoning, systemic manifestations include hypotension or shock, bleeding, blood cell changes, and sometimes neurological effects. In viper bites involving defibrinogenation, such as bites by Echis carinatus or Agkistrodon rhodostoma, the diagnosis and to some extent the degree of severity can be assessed from the observation of spontaneous haemorrhage and non-clotting blood. Systemic poisoning from elapid bites principally