

SNAKE VENOM POISONING: EXPERIENCE WITH 633 CASES

M.L. Kulkarni
S. Anees

ABSTRACT

Snake venom poisoning is a common medical emergency and the epidemiological features vary from region to region. We conducted a prospective study to review the epidemiology, treatment and outcome of snake venom poisoning in central Karnataka.

Six hundred and thirty three cases of snake bite, seen in a teaching hospital, upto the age of 18 years, over a period of 8 years from 1985 to 1992 constituted the material for the study. Detailed history with special reference to the type of snake, circumstances leading to the bite and clinical consequences were studied and final outcome was noted.

Males (n=433) were bitten more often than females (n=200). Two hundred and fifty six (40.4%) cases were in the age range of 11-15 years. The cases were seen during two periods, i.e., Oct, Nov, Dec (n=210) and Apr, May, June (n=199). Most (n=506) were encountered in the lower limbs. Viper was the most common poisonous snake. Five hundred and seventy (90%) cases were from rural area. Coagulation time was prolonged in 371 (58.6%) cases, hemorrhagic syndrome was noticed in 354 (55.9%) cases, neurological involvement in 79 (12.5%) cases. Polyvalent anti snake venom (ASV) was given to 479 cases. Hypersensitivity to ASV was noted in 8 cases. Blood transfusion was given to 33 cases for the management of excessive bleeding. The death rate among snake victims was 5.2% (33 cases).

The morbidity and mortality can be reduced substantially by increasing and maintaining confidence in good medical care and providing health education.

Key words: Snake bite.

Snake bite is a common medical emergency and an occupational hazard, more so in tropical India, where farming is a major source of employment. Children of field workers, forced into child labor are in a life risking occupation. There are about 3000 species of snakes in the world known to date, out of which 300 species are poisonous to man(1). The number of deaths due to snake bite in India is estimated to be about 15,000-20,000 per year(2). In view of snake bite being such a common occupational health hazard, we conducted a study to review the epidemiology, treatment and outcome of snake bites in and around Davangere, Karnataka.

Material and Methods

A prospective study of all the patients below 15 years with snake venom poisoning admitted to C.G. Hospital, Davangere, during the period January 1985 to December 1992, was undertaken. This hospital is a referral centre for a population of about 800,000. The average total pediatric admissions per year to this hospital was 3500 cases during the study period.

The details of each case were entered in a proforma, which highlighted the main points such as the snake bite incidence, most common species, male female ratio, the age group of victims, circumstances of bite, the time and site of bite, the symptoms noticed on hospital admission, the treatment instituted and the final outcome.

From the Department of Pediatrics, J.J.M. Medical College, Davangere 577 004, Karnataka.

Reprint requests: Prof. M.L. Kulkarni, 2372, M.C.C. 'A' Block, Davangere 577 004, Karnataka.

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Evidence of bite by a poisonous snake included: (i) presence of fang marks, (ii) presence of swelling, ecchymosis, blister formation and/or bleeding from local site, (iii) disturbances in coagulation mechanism with or without systemic bleeding, and (iv) identification of snake wherever possible.

Hemoglobin, bleeding and coagulation time, platelet count, and urine analysis were done at frequent intervals to assess progress of the case. Other investigations like electrocardiogram, chest X-ray, cerebrospinal fluid studies and liver function tests were done whenever indicated. Specific treatment composed of polyvalent anti snake venom (ASV). Abnormal local site and/or coagulation disturbances or neurological manifestations were considered as the absolute indication for use of ASV. Our mode of ASV therapy was administration of single dose of 1 vial (10 ml) of ASV diluted with three volumes of normal saline or 5% dextrose and infused at a very slow rate for first few minutes and then increased over the next one hour, after testing for sensitivity reactions. Thereafter, depending on the clinical response, the same dose was repeated every two hours till all the systemic signs and symptoms disappeared or progression of swelling ceases. SAV was not given when there were no clinical signs and symptoms of envenomation and bleeding and clotting time were normal. Supportive measures included antihistamines, antibiotics, blood transfusion and steroids whenever indicated. All cases were given tetanus vaccine.

Results

Epidemiological Aspects

Incidence: Cases of snake bite contributed to 2.2% of our hospital admission during the study period.

Age and sex distribution: Of the 633 cases, the age ranged between 0-18 years, the maximum cases (40.4%) were in the age group of 11-15 years. The youngest patient recorded was a 9 months old female baby bitten at home. Four hundred and thirty three cases were males and 200 females.

Site of bite, time of day and season: Field predominance of the victims was obvious with 570 (90%) cases being from rural areas. Snake bite mostly occurred over the lower limbs (79.9%) usually around the ankle region. Upper limbs accounted for 123 (19.4%) cases, while 4 subjects came with bites over back and trunk.

Four hundred and thirty two (68.2%) cases were bitten during day and 201 (31.8%) cases were bitten during night. Three hundred and fifty nine (56.7%) cases were bitten either while working or walking in the fields and 154 (24.3%) were bitten in and around their homes.

In 210 (33.2%) cases, snake bite occurred in the months of October, November and December and 199 (31.4%) in the month of April, May and June.

Type of snake: The biting species was identified in only 388 cases. The commonest was viper (242 cases) followed by cobra (129 cases), water snake (10 cases) and krait (7 cases).

Time of presentation and duration of hospital stay: 494 (78%) cases were admitted within the first 24 hours after the bite. Only 42 (6.6%) cases were admitted within the first hour, 79 (12.5%) between 2nd and 6th day, 18 (2.8%) between 7 and 15 days after the bite. The average duration of hospital stay was 4 days; with a range of 3 to 35 days.

First aid measures: First aid treatment given before admission in 75 (12%) cases

comprized of application of a tight tourniquet proximal to the site of bite, and in some cases multiple incisions and scarification at the site of bite. In few cases traditional remedies like oral intake of herbal medicines and local applications of herbs and roots were tried.

Clinical Features

Local pain, fear, anxiety and fright were present in most of the cases. In 454 (71.8%), 2 marks 0.5-1 cm apart, often with persistent oozing of blood from the bite mark was seen. Examination of local site revealed inflammatory swelling, bleeding, ecchymosis and blister formation in 461 (73.0%) 455 (72%), 398 (62.9%) and 84 (11.3%) cases, respectively. Two cases developed local necrosis.

Systemic Manifestations

Hemorrhagic syndrome was a common presentation in many cases. This referred to internal hemorrhage and hemorrhage from sites other than the local and was observed in 354 (55.9%) cases. These include hemetemesis, hematuria, epitaxis, bleeding per rectum and bleeding gums. Coagulation disturbance was observed in 371 (58.6%) cases. Neurological involvement was seen in 79 (12.5%) cases, all bitten by cobra. Nine (1.4%) cases developed acute renal failure.

Management

For the majority of cases (341 cases), one vial (10 ml) of ASV was given, another 138 cases were given repeated doses of ASV. Maximum dose given was 8 vials of ASV. For the remaining 154 cases, ASV was not given.

Hypersensitivity to ASV was noted in 8 patients. Mild reactions like itching, urticaria, fever, tachycardia, palpitations,

cough, nausea and vomiting were noted in 4 patients. Three patients showed features of systemic anaphylaxis like bronchospasm, hypotension, angioneurotic edema. Late (serum sickness) type of reactions after 8 days of treatment was noted in one patient. Symptoms included fever, itching and urticaria.

Supportive treatment with blood transfusion was given in 33 cases. Corticosteroids were used in 8 patients, who had reactions to ASV.

Thirty three (5.2%) cases died in the hospital with a male female ratio of 3:1, due to severe internal hemorrhage and hemorrhage from local site (15 cases), respiratory paralysis (5 cases), peripheral circulatory failure (7 cases), sub archnoid hemorrhage (3 cases), uremia (2 cases) and infection following necrosis (1 case).

Discussion

Of the 4 major virulent types of poisonous snakes in India *viz*, Cobra, Krait, Russels viper and *Ecchis carinata* (saw scaled viper)(3), the common species encountered in and around Davangere, are the vipers and cobra.

Male predominance, higher incidence in field areas, involvement of lower extremities are common features in many studies(4-7). We had more number of cases bitten during day time as people are engaged in farming, contrary to nocturnal occurrence in few studies(6).

We did not find any significant increase in victims belonging to a particular community or religion. Severity of poisoning showed no significant variations based on day, month, or time of bite.

The intensity of local reactions as indicator of severity of envenomation also corroborated with the impression of other

workers(4). We recorded a delay in recovery of those cases, who tried traditional remedies, like scarification of local site and herbal medicines, before admission to hospital, as reported in earlier study(4).

Viperine bites produce more of local swelling, hemorrhage and shock(3). We recorded hemorrhagic manifestations in 55.9% of the cases. Bhat(7) and Saini *et al.*(5) in their study recorded hemorrhagic manifestations in 65% and 47.8%, respectively. Another study by Warrel *et al.* (8) found the same in 68%. These differences in the frequency of hemorrhagic manifestation in different series imply differences between the venoms of the sub species around the world(8).

The systemic effects of elapid venoms are predominantly neurotoxic causing a selective neuromuscular block, affecting mainly the muscles of the eyes, tongue, throat and chest, leading to respiratory failure in severe poisoning. Prevalence of neurotoxic symptoms is quite variable in different studies(9,10). We encountered these symptoms in 79 (12.5%) cases. The common symptoms were ptosis and drowsiness (72 Cases), 6 cases developed respiratory failure, 2 cases each presented with cranial nerve palsy and aphasia.

Nine (1.4%) cases in our study developed acute renal failure, who were all managed conservatively. Lahori *et al.* (4) in their study of children with snake bites observed 1% incidence of renal failure, whereas Saini *et al.*(5) reported 4% in their study in adults with snake bites. It could be possible that children have less chances of developing acute renal failure than adults, following snake bite.

The previous belief that ASV is of no use 24 hours after the bite, stands unfounded as this reverts the coagulation

defect even when used many days after the bite. We have used ASV in patients coming after 15 days of snake bite, with favorable outcome.

The mortality rate among snake bite victims in our study was 5.2%. In another study of snake venom poisoning among children, the mortality was 3%(4). The earlier reported studies(5,6,11). mostly in adults, showed mortality rates of 1.3%, 5% and 10.1%, respectively. These high mortality figures noted in different studies might be due to non-availability of medical facilities in remote rural areas, poor transport facilities to the hospital and also due to the valuable time lost in giving traditional medicines.

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