

A Clinicoepidemiological Study of Snakebite in Multan

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Objective: To know the epidemiological characteristics of snakebite in and around Multan and to highlight various patterns of toxicity in sufferers of snake's envenomation. **Design:** Descriptive, observational study. **Place & duration of study:** This study was conducted at Medical Unit-IV, Nishtar Hospital, Multan during the year 2002-2003. **Patients and Methods:** One hundred victims of snakebite from seven various districts around Multan, who were brought to Nishtar Hospital, Multan, irrespective of age, sex and previous medical therapy were included in this study. All victims of snakebite were examined and investigated to know the various patterns of toxicity. **Results:** Most of the victims (78%) were found to be sufferers of toxic bite, affected mostly on lower limbs (62%) and during night time (52%) of summer season. Hemotoxic snakes were the most common type of snakes (52%) causing envenomations. 90% patients recovered completely and a death rate of 6% and disability rate of 4% was observed. **Conclusion:** Morbidity and mortality from snakebite can be reduced by proper health education of the farmers, regarding importance of footwear and potential hazards of snakebite.

Key Words: Snakebite, epidaemiological characteristics, patterns of toxicity

Venomous snakes are native throughout the world¹. Snake envenomation is an acute public health problem in many areas of Pakistan, especially South Punjab and Sindh. Due to the cultural traditions and socio-economic factors, all cases are not seen by physicians. In Sindh, records of secondary health care centres have shown it to be among the five commonest causes of admission to hospitals. Based on the use of antivenom, it is estimated that at least 40,000 episodes of snakebite occur each year². Snake venom is a complex mixture of various enzymes, basic polypeptides and some low molecular weight proteins. Snake venom affects almost every organ system of the body either directly or indirectly, through the release of various autopharmacological substances e.g. kinins and complement components³. The most deleterious effects are seen in the cardiovascular, hematologic, respiratory and nervous system^{4,5}. This study was conducted to know the epidemiological characteristics of snakebite in and around Multan and to highlight various patterns of its toxicity.

Materials and methods:

Multan and seven various districts around it, having a total population of more than 10 million, are catchment area of tertiary care hospital, Nishtar Hospital, Multan. All victims of snakebite brought to this hospital, irrespective of age, sex and previous medical therapy were included in this study.

Bite was regarded as toxic when anyone of the followings was present singly or in combination:-

1. Clinical parameters of toxicity (local swelling, blistering, local or systemic bleeding, shock, cranial nerve palsies, respiratory insufficiency, Seizures, unconsciousness) were present with appropriate laboratory derangements (polymorphonuclear leucocytosis, raised APTT or PT, decreased platelet count or increased FDP).
2. Laboratory abnormalities like increased APTT without overt clinical manifestations.

Every asymptomatic victim was retained for a minimum period of 24 hours to be monitored clinically half hourly and laboratory wise one hourly and was discharged if found non-toxic at the end of this period. Other investigations included were; ECG - for ST-T changes of myocarditis, Fundoscopy - for retinal haemorrhage, CT-brain-for intracranial haemorrhage, Urine for myoglobin and serum creatinine kinase.

The mainstay of treatment was the polyvalent antivenom, supported with FFP/blood transfusion, antibiotics and artificial ventilation, in appropriate settings. Pre medication was done with chlorpheniramine (25 mg I/V) and hydrocortisone (100 mg I/V). Patients were discharged only when clinical and laboratory abnormalities settled.

Disability was defined by the development of permanent organ dysfunction (hemiplegia due to intracerebral haemorrhage or permanent loss of higher mental functions due to hypoxic brain damage resulting from respiratory insufficiency).

Results:

One hundred victims were studied with maximum number recorded in July (34%). The age range was 4-56 years (mean 27.8 ± 10.97 years). 2% were below 10 and 4% above 50 years. 76% victims were field/farm workers, 6% grocer, 10% casual worker group (housewives, students, children, and businessmen). Bite was accidental in all cases. 90% sufferers were from rural areas of various districts (Multan 28%, Khanewal 24%, Muzaffargarh 32%, Sahiwal 2%, Vehari 4%, Lodhran 2%, D.G. Khan 6% and Rajanpur 2%). 78% sufferers were males and 22% females. 62% had bite on lower extremities (55% below knees and only 7% on thighs). 38% had bite on upper limbs (35% on hands). One victim was struck on scrotum while micturating on a burrow. No case of bite on chest or face was recorded. 48% had bite during day and 52% at night. Majority had a toxic bite (78%) as shown in table-I.

Vasulotoxicity (52%) was the major type of poisoning followed by neurotoxicity (22%) and local toxicity (4%).

In vasulotoxic bites, 18% had bleeding from all systems of the body retinal haemorrhage 4%, intracerebral haemorrhage 2%, bleeding from GIT 18%, skin 10%, respiratory tract 12%, urinary tract 18%, ears 2% and nose 14%. Maximum APTT was 360 seconds (control = 25 sec). 22% had APTT <50 sec, while 30% had APTT > 50 sec. All vasulotoxic patients 52%, had afibrinogenemia,

while 20% had thrombocytopenia (platelet count <150,000) also. Myocarditis occurred in 6%, all suffers of vasulotoxic bites (Table-2).

Six victims of neurotoxic bite required ventilatory support (29% of this group) all recovered completely. Disability rate was neurotoxic (2%) and vasculotoxic 2% each. Overall death rate was 6%⁷, (neurotoxic cases had 9.6% and vasculotoxic 3.8%) (Table-3).

Table 1 (n=100)

Mean age (Year)	Victims of rural areas	Site		Sex		Time of Bite	
		UL	LL	Male	Female	Day	Night
27.8± 10.97	90	38	62	78	22	48	52

UL: upper limb, LL: lower limb

Table 2. Vasulotoxic cases (n=52)

Mean APTT	Platelet count	Afibrinogenemia	Intracranial haemorrhage	Retinal haemorrhage	Myocarditis	Renal failure	Disability	Death
72.06 ± 83.54 sec	20	52	4	4	6	-	2 (3.8%)	2 (3.8%)

Table 3. Neurotoxic cases

Total cases	Ventilatory support	Myocarditis	Coagulopathy	Renal failure	Disability	Death
22	6(29%)	-	-	-	2(3.8%)	4(9.4%)

Discussion

Adult farmers of our community are the chief victims of snakebite⁸, because of their active involvement in the field work. Although, not to that much extent, women are also exposed to this hazard because of outdoor activities, they have to perform. Most of the farm workers do not have proper footwear for protection against this problem. The situation occurs mostly at nights of hot humid summers when the reptiles move out of their burrows in search of food. These are also the breeding days for vipers and kraits². Moreover, certain habits of the villagers i.e. sitting and sleeping on ground further predisposes to snakebite². Results are comparable to those reported in literature⁹. Although the hospital data may not reflect the total number of bites in an area, but it is obvious that most of the patients brought to hospital are sufferers of toxic bite (78%)^{7,9}, and the major pattern of toxicity is hemotoxicity (52%) followed by neurotoxicity (22%)¹⁰. Absence of myotoxicity shows that terrestrial snakes in this area probably do not have much myotoxic effects. Significant disturbances in renal function are uncommon with any type of poisoning as none of the patients in our study developed renal failure. It is quite common for victims to present at an advanced stage of toxicity as evidenced by:

- APTT >100 sec in 24% and APTT >300 sec in 6% vasulotoxic cases.
- Occurrence of bleeding from all systems of body in 18% cases.

- Myocarditis in 6% cases.
- Requirement for assisted ventilation in 29% neurotoxic cases.

The possible reasons may be:

- The use of traditional healing methods which do not have any definite role in combating this situation.
- Lack of transport facilities due to nighttime bite.
- Late onset of symptoms of toxicity.
- Ignorance about the potential hazards of snakebite.

Disability (due to intracranial haemorrhage 2% and hypoxic brain damage 2%) and death (due to shock, respiratory failure)¹¹ can be avoided by early referral of these patients to a hospital where antivenom and other supportive measures like artificial ventilation are available. 90% patients recovered completely. The death rate of 6% is comparable to the studies done previously in India, but is high from those done in Zimbabwe^{7,12}.

Conclusion:

1. The farm workers of our rural areas need to be educated about the potential hazards and protective measures for snakebite.
2. Snake envenomation is a potentially reversible condition.
3. Antivenom is the definite way of treating these patients.

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