

Original Research Article

Clinical profile and outcome of snakebite poisoning in sub-district hospital Akhnoor

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Received: 10 March 2021

Accepted: 25 March 2021

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ABSTRACT

Background: In a predominantly agricultural country like India, with rich in flora and fauna, long rainy season and rural background, the encounter between man and snake is a frequent occurrence. Viper-bites are more common than other poisonous snakebites. Only the cases of snakebite with severe envenomation reach the health care centers. This study was planned to analyze the presentation of complaints and symptoms in snake bite patients.

Methods: This 'record based descriptive observational study' was carried out over a period of 6 months from May 2020 to November 2020 in Sub District hospital Akhnoor. A total of 96 patients with a history of snake bite and signs of envenomation were included in this study.

Results: Incidence was higher among people from rural background (86.46%), more among males (67.71%) and highest among farmers (53.13%) and labourers (16.67%). Maximum no of snakebites took place during night and on the lower parts of body, mainly legs (54.17%); while the period of the study contained the peak rainy season of the region. As many as 39.58% of victims didn't receive any kind of formal first aid at all and as many as 48.96% patients reported after a minimum delay of 6 hours, which could be considered as potentially fatal. Chief complaints among the reported patients of snake bite were found to be: Local edema, bleeding, vomiting, drowsiness, ptosis and Ophthalmoplegia.

Conclusions: There is an urgent and dire need for awareness and education among rural population about the hazards involved and treatment of snakebite.

Keywords: Envenomation, Snakebite, Vasculotoxic, Neurotoxic, Neuroparalytic, Ptosis, Ophthalmoplegia

INTRODUCTION

Snake poisoning is a major public health problem throughout the world, more so in tropical and subtropical countries. In a predominantly agricultural country like India, rich in flora and fauna, the encounter between man and snake is a frequent occurrence.¹ It is an occupational hazard and a common medical emergency in tropical India, where farming is a major source of employment. Long rainy season, agricultural predominant occupations, rural background and population using paths traversing pastoral, countryside and forest lands makes people prone to snake bites.² Over 2000 species of snakes are known

worldwide, of which 100 are poisonous. These snakes majorly belong to the families: *Elapidae*, *Viperidae*, *Hydrophiidae* and *colubridae*.³ Viper-bites are more common than other poisonous snakebites. The main cause of severity or fatality after snake bite is that people try out all kinds of "bizarre remedies" initially, instead of going to the nearest healthcare facility. In India, there are 216 species of snake, of which only four are venomous snakes (Cobra, Krait, Russell's viper and saw scaled viper). Of the different varieties of vipers, the Russell's viper (*Viper russelli*) commonly inhabits the Southern Asian countries.⁴ Indian Cobra (*Naja naja*) and common Indian Krait (*Bungarus caeruleus*) are two important species of

elapid snakes found in India and are responsible for most of the cases of neurotoxic snake bite, but the most poisonous snake is common Krait.⁵ The overall mortality rates for victim's venomous snakebites are low in regions with rapid access to medical care and appropriate anti-venoms. The available data on the epidemiology of snakebite from the Indian subcontinent are sparse, because most of the snake bites occur in illiterate, rural people who use witchcraft and traditional healers.⁶ Only the cases of snakebite with severe envenomation reach the health care centers. This situation is worse in the Kandi Belt of Jammu region of Jammu and Kashmir State of India, of which Akhnoor forms a major part. Hence this study was planned for Sub-district Akhnoor, where the incidence was always considered very high but the quantum of studies was not much. The aim of the study was to analyze the presentation of complaints and symptoms in snake bite patients.

METHODS

This 'record based descriptive observational study' was carried out for 6 months from May to Nov 2020 in Sub-district hospital Akhnoor. A total of 96 patients with a history of snake bite and signs of envenomation were included in this study after an informed consent for participation in the study. Evidence of bite by a poisonous snake are included in this study and terms related to the clinical manifestations and features of snakebite (Table 1).

Table 1: Terms related to the clinical manifestations and features of snake bites.

Term	Definition
Blisters	Blister is a fluid-filled bubble people get where something rubs or burns the skin
Cellulitis	Cellulitis is a common and sometimes painful bacterial skin infection. It may first appear as a red, swollen area that feels hot and tender to the touch
Fasciotomy	Fasciotomy is a surgery or cut to relieve swelling and pressure in a compartment of the body/tissue
Hematuria	Hematuria is the presence of blood in urine
Necrosis	Necrosis is the death of most or all of the cells in an organ or tissue due to disease, injury, or failure of the blood supply
Oliguria	Oliguria is the production of abnormally small amounts of urine
Ophthalmoplegia	Ophthalmoplegia is the paralysis or weakness of one or more of the eye muscles
Ptosis	Ptosis is drooping of the upper eyelid due to paralysis or disease
Prothrombin time	Prothrombin Time tells you how long it takes your blood to clot

Whereas patients with pre-existing renal disease, liver dysfunction and bleeding disorder were excluded.

After obtaining consent, data was collected on pre-designed and structured questionnaire by interviewing the study subjects who were hospitalized during this study period. A detailed information regarding demographic and epidemiological parameters, time interval to reach health facility and first-aid received was obtained from the victims. Subsequent information like complications and outcome was collected on the date of discharge or death of patient from the discharge sheet. The study was duly approved by institutional ethical committee. The results were analyzed statistically using suitable software (MS excel 2010 in this case).

RESULTS

In the present study 96 patients of snake bite were studied. Complete demographic profile taken and further details like: time of incidence, presentation time, type of first aid received, etc. Incidence was higher among people from rural background (86.46%), more among males (67.71%) and highest among farmers (53.13%) and labourers (16.67%).

Table 2: Demographic and clinical profile of patients of snake bite.

Demographic/c linical profile related to snake bite	Description/char acteristic	N	%
Gender	Male	65	67.71
	Female	31	32.29
Age	<30 years	56	58.33
	≥30 years	40	41.67
Residence	Rural	83	86.46
	Urban	13	13.54
Occupation	Farmer	51	53.13
	Labourer	16	16.67
	Student	9	9.38
	House wife	12	12.50
	Other	8	8.33
Diurnal variation	Day-time	33	34.38
	Night-time	63	65.63
Site of bite	Hand	42	43.75
	Leg	52	54.17
	Other part of body	2	2.08
Type of first aid received	Torniquet	58	60.42
	None	38	39.58
Presentation time	Within 6 hours of bite (Timely)	49	51.04
	After 6 hours of bite (Delayed)	47	48.96
Whether stake identified	Yes	56	58.33
	No	40	41.67

Maximum no of snakebites took place during night and on the lower parts of body, mainly legs (54.17%). The significant issue being that the reporting was delayed for more than 6 hours in 47 out of the 96 reported patients (Table 2).

Table 3: Presentation of complaints and symptoms in snake bite patients.

Presentation of clinical issues	Among 'Timely'		Among 'Delayed'	
	N	%	N	%
Local edema	15	30.61	25	53.19
Local bleeding	19	38.78	18	38.30
Blisters	2	4.08	12	25.53
Cellulitis	3	6.12	11	23.40
Gum bleeding	1	2.04	0	0.00
Vomiting	39	79.59	31	65.96
Drowsiness	18	36.73	29	61.70
Necrosis	0	0.00	3	6.38
Ptosis	28	57.14	32	68.09
Ophthalmoplegia	12	24.49	23	48.94
Oliguria	1	2.04	6	12.77
Hematuria	2	4.08	7	14.89
Acute renal failure	1	2.04	9	19.15
Prolonged prothrombin time	11	22.45	20	42.55
Fasciotomy required	3	6.12	5	10.64
Dialysis required	2	4.08	5	10.64
Mechanical ventilation required	12	24.49	16	34.04

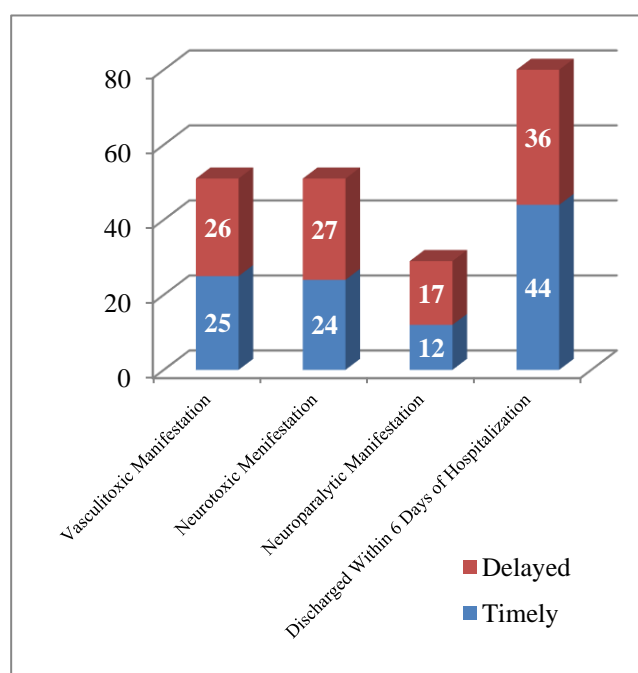


Figure 1: Clinical features of snake bite among reported patients.

DISCUSSION

As this study was planned for the months of May to November, which also contained the peak rainy season of the region: monsoons and reportedly the peak snake-bite months as well. Jammu district of the state of Jammu and Kashmir lies among the low heights of the Shivalik hills or the foothills of Himalaya. It has 38% of tropical forest cover, with approximately 90% of its population living in a rural set up or in such locales which cross the habitat of different species of reptiles. This makes the probability of human to reptile contact very high. Most of the snakebites occur during the monsoon season, because of the flooding of the habitats of the snakes and also that of their prey. In most of the cases, i.e., 58.33% cases the snake was identified but still a very significant percentage of cases could not identify the snake at all.

Snake bite may be termed as an occupational disease, as farmers, plantation workers, hunters and workers on the construction sites get affected.⁷ In the present study, patients were mostly young and predominantly males. Women from hilly background are often involved in cutting of grass and arranging fodder for their cattle which makes them vulnerable too. This suggests that more ambulant population is at a higher risk of snake bite, quite similar to the studies conducted by Mohapatra et al, Monteiro et al and Ahmed et al.^{1,8,9}

Reid et al have discussed that snakebites in tropical countries are mostly on lower extremities because the victims tend to travel near the snake or sometimes step on them, while bites on hands occurred because the victim deliberately handles the snake; accordingly, site of bite in our study was chiefly legs (54.17%).¹⁰ Besides other things, it could be observed that 65.63% of cases occurred during night and Sharma et al and Virmani et al reported similar findings on their set of research on similar geographical location.^{11,12}

Almost 100% patents of neuromuscular bite developed ptosis as well as Ophthalmoplegia, similar to the findings of Seneviratne et al as well.¹³ Prothrombin time was prolonged in 31 (32.29%) patients with snake bite and similar incidence has been reported by Saini et al.¹⁴

Bite to treatment delays as reported in this study were similarly studied and reported by research studies of Agarwal et al, Logaraj et al and Halesha et al.^{6,15,16} As many as 39.58% of victims didn't receive any kind of formal first aid at all and as many as 48.96% patients reported after a minimum delay of 6 hours, which could be considered as really dangerous and potentially fatal. This may be attributed to the geography, topography, lack of transportation facilities as well as the lack of awareness and initial preference for the alternative system of medicine.¹⁷

The limitation of the study was that it was a retrospective analysis and some of the important data were incomplete

or insufficient for statistical compliance. Several of such snakebites are reported at primary healthcare centers and not referred to higher centers, leading to the data being less representative.

CONCLUSION

The available data on the epidemiology of snake bite is sparse, but it can be easily inferred that any kind of delay in presentation after snakebite developed complications that may need surgical intervention, organ failures, extensive hospital care or even fatality. More often than not, the traditional methods for the first aid treatment of snakebite will lead to more harm than good. There is an urgent and dire need for awareness and education among rural population about the hazards involved and treatment of snakebite.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

- Mohapatra B, Warell D, Swaweera W, Bhatia P, Dhingra N. Snake mortality in India: A nationally representative mortality survey. *Plos Trop Dis* 2011;5(4):108-12.
- Raina S, Kaul R, Chander V, Jaryal A. Snake bite profile medical college in rural setting in the hills of Himachal Pradesh, India. *Indian J Crit Care Med*. 2014;18(3):134-8.
- Ruha AM, Klanschmidt KC, Greene S, Spyzas MB, Brent J, Wax P et al. Toxic snake bite study group. The epidemiology, clinical course, and management of snake bites in north America snakebite registry. *J Med Toxicol*. 2017;13(4):309-20.
- Narvencar K. Correlation between timing of ASV administration and complication in snake bites. *J Assoc Physicians India*. 2006;54:717-9.
- Sliva A, Maduwage K, Sedgwick M, Pilapitiya S, Weerawansa P, Dahanayaka N. Neuromuscular effects of common krait envenoming in Sri Lanka. *Plos Negl Trop Dis*. 2016;10(2):e0004368.
- Halesha BR, Harshvardhan L, Lokesh AJ, Channaveerapa PK, Venkatesh KB. A study on clinic-epidemiological profile and outcome of snake bite victims in tertiary care center in southern India. *J Clin Diagn Res*. 2013;7(1):122-36.
- Warrel DA. The WHO/SEARO guidelines for the clinical management of snake bite in the Southern India: the clinical profile and the factors which are involved in the adverse outcomes. *Emerg Med J*. 2008;25:200-4.
- Monteiro FN, Kanchan T, Bhagavath P. Clinico-epidemiological features of viper bite envenomation: A study from Manipal, South India. *Singapore Med J*. 2012;53:203-7.
- Ahmed SM, Nadeem A, Islam MS. Retrospective analysis of snake victims in Northern India admitted in a tertiary level institute. *J Anaesthesiol Clin Pharmacol*. 2012;28:45-50.
- Reid HA, Theakston RD. The management of snake bite. *Bull WHO*. 1983;61:885-95.
- Sharma N, Chauhan S, Faruqi S, Bhat P, Varma S. Snake envenomation in a North Indian hospital. *Emerg Med J*. 2005;22:118-20.
- Virmani SK, Dutt OP. A profile of snake bite poisoning in Jammu region. *J Indian Med Assoc*. 1987;85:132-4.
- Seneviratne U, Dissanayayake S. Neurological manifestations of snake bite in Sri Lanka. *J Postgrad Med*. 2002;48:275-8.
- Saini RK, Sharma S, Singh S, Pathania NS. Snake bite poisoning: A Preliminary report. *J Assoc Physicians India*. 1984;32:195-7.
- Agarwal R, Aggarwal AN, Gupta D, Behera D, Jindal SK. Low dose of snake antivenom is as effective as high dose in patients with severe neurotoxic snake envenoming. *Emerg Med J*. 2005;22:397-9.
- Logaraj M, Thirumavalavan R, Gopalakrishnan S. Epidemiology of snakebite reported in a Medical College Hospital in Tamil Nadu. *Int J Health Allied Sci*. 2013;2:53-5.
- Alorol E, Sharma SK, Bawaskar HS, Kuch U, Chappuis F. Snake bite in South Asia: A review. *PLoS Negl Trop Dis*. 2010;4(1):e603.

Cite this article as: Sharma C, Badyal A, Kumar S. Clinical profile and outcome of snakebite poisoning in sub-district hospital Akhnoor. *Int J Adv Med* 2021;8:644-7.