

Study Of Clinical Profile of Patients with Snake Bites in A Tertiary Care Hospital in Rural Konkan, Maharashtra.

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Abstract

Background: Snakebite remains a critical, neglected tropical disease and a life-threatening medical emergency, particularly in rural India. High morbidity and mortality are often due to delays in hospital presentation and the use of traditional treatments. This study aimed to analyze the clinical profile and outcomes of snakebite victims presenting to a rural tertiary care center. **Objectives:** To analyze the clinical and epidemiological profile of snakebite victims presenting to a tertiary care hospital in rural Konkan, Maharashtra. **Methods:** A hospital-based cross-sectional study was conducted in the Department of Pediatrics at BKL Walawalakar Hospital, Dervan, from January 2025 to June 2025. A total of 60 consecutive pediatric-patients with a confirmed history of snakebite were enrolled. Data on demographics, bite details, clinical features, and treatment were collected and analyzed. **Results:** The majority of victims were males (63.3%, 56.7%). Most bites occurred indoors (56.7%) on lower limbs (61.7%). Neuroparalytic manifestations (ptosis, respiratory weakness) were observed in 28.3% of patients, while hematotoxic manifestations were seen in 11.7%. Harmful first-aid practices like tourniquet application (10%) and incision (8.3%) were reported. The case fatality rate was 5%. **Conclusion:** Snakebite predominantly affects male children in this region. Neurotoxicity was a more common presentation than hematotoxicity. Community education on early hospital referral and avoiding harmful first-aid practices is crucial to reducing complications and mortality.

Keywords: Clinical profile, Envenomation, Epidemiology



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INTRODUCTION

Snakebite envenomation is a significant global health burden, officially classified as a Neglected Tropical Disease by the World Health Organization. It disproportionately affects rural populations in tropical and subtropical countries, with India bearing the highest burden, accounting for an estimated 58,000 deaths annually according to the Million Death Study [1]. The agrarian economy of rural India places a large population, particularly farmers and laborers, at high risk of encountering snakes during agricultural activities or within their dwellings [2].

The "Big Four" venomous snakes—Indian Cobra (*Naja naja*), Common Krait (*Bungarus caeruleus*), Russell's Viper (*Daboia russelii*), and Saw-scaled Viper (*Echis carinatus*)—are responsible for the majority of life-threatening envenomations in the Indian subcontinent [3]. Envenomation can lead to two primary syndromic presentations: neurotoxic paralysis, characterized by ptosis, ophthalmoplegia, and progressive respiratory failure, commonly associated with elapids (kraits and cobras); and hemotoxic/vascular effects, including local tissue damage, coagulopathy, systemic bleeding, and acute kidney injury, typically caused by viperidae [4].

Despite the availability of effective treatment with polyvalent anti-snake venom (ASV), pre-hospital factors remain major contributors to poor outcomes. These include the application of harmful first-aid measures (e.g., tourniquets, incision), initial consultation with traditional healers, and delays in reaching appropriate medical care [5]. This study aims to elucidate the clinical and epidemiological profile of snakebite victims presenting to a tertiary care hospital in the rural Konkan region of Maharashtra, which will help in improving local management protocols and public health interventions.

MATERIALS AND METHODS

A hospital-based cross-sectional study was conducted between January 2025 to June 2025 in the Department of Pediatrics at BKL Walawalakar Rural Hospital, Dervan, Ratnagiri, a tertiary care center serving the rural population of the Konkan

region. A total of 60 consecutive patients of age ≤ 12 years and both genders presenting with a history of snakebite, with or without evidence of envenomation (local swelling, pain, neurotoxic or hematotoxic signs), were included in the study. Patients with wounds from other animals, those with psychiatric illness, or those who left against medical advice before initial assessment were excluded. After obtaining informed consent, detailed history and clinical examination findings were recorded on a pre-designed, semi-structured proforma. Parameters included demographic data, details of the bite (time, place, site), first-aid measures used, clinical manifestations, treatment received (including number of ASV vials), and outcome.

Statistical Analysis: Data was entered into Microsoft Excel and analyzed using appropriate statistical software. Descriptive statistics were presented as frequencies, percentages, means, and standard deviations.

RESULTS

Table 1: Socio-demographic profile of snakebite patients (n=60)

Parameter	Category	Number (n)	Percentage (%)
Age Group (Years)	1 to 3	8	13.3
	4 to 6	14	23.3
	7 to 9	17	28.3
	10 to 12	21	35.0
Gender	Male	38	63.3
	Female	22	36.7
Residence	Rural	52	86.7
	Urban	8	13.3
Total		60	100.0

A total of 60 snakebite cases, the largest single group was 10 to 12 years old (35.0%) followed by 28.3% from age group 7 to 9 years. There was a notable male predominance, with males comprising 63.3% of the cases and females 36.7%. Males in this region are at a higher risk.

The vast majority of patients (86.7%) were residents of rural areas, underscoring that snakebite is primarily a rural health problem in this region.

Table 2: Profile of the snakebite incident (n=60)

Parameter	Category	Number (n)	Percentage (%)
Snake Identified	Cobra	5	8.3
	Krait	3	5.0
	Viper	3	5.0
	Unknown	49	81.7
Time of Bite	12 pm - 6 pm	21	35.0
	6 pm - 12 am	18	30.0
	6 am - 12 pm	16	26.7
	12 am - 6 am	5	8.3
Place of Bite	Indoor	34	56.7
	Outdoor	26	43.3
Site of Bite	Lower Limb	37	61.7
	Upper Limb	21	35.0
	Other (Trunk, etc.)	2	3.3
Time to Hospital	< 6 hours	51	85.0
	6 - 24 hours	8	13.3
	> 24 hours	1	1.7
Total		60	100.0

Clinical manifestations among snakebite patients:

The clinical manifestations are detailed in Table 3. Local symptoms like pain and swelling were the most common. Neuroparalytic manifestations (e.g., ptosis) were observed in 17 patients (28.3%), while hematotoxic manifestations were seen in 7 patients (11.7%).

Table 3: First-aid practices

Parameter	Category	Number (n)	Percentage (%)
Tourniquet Applied	Yes	6	10.0
	No	54	90.0
Incision/Suction	Yes	5	8.3
	No	55	91.7

Outcome of the Patients

First-aid practices are shown in Table 4. The use of a tourniquet was reported by 6 patients (10.0%), and harmful practices like incision were reported by 5 patients (8.3%). The average number of ASV vials used was 7.2. Three patients (5.0%) succumbed to their envenomation.

DISCUSSION

This study provides a contemporary overview of the clinical and epidemiological profile of snakebite victims in the rural Konkan region of Maharashtra. Our findings align with and sometimes contrast the national and regional data, highlighting the importance of localized studies. The predominance of male victims (63.3%) is a consistent finding across numerous Indian studies, such as those by Patil et al. (2022) in Karnataka (68.5% males) and by Sharma et al. (2021) in North India (65.1% males) [6,7] and Haridas et al. (2023) [8].

A notable finding was that a majority of bites occurred indoors (56.7%), which contrasts with several studies reporting a higher incidence of outdoor bites [6,7]. However, this supports the findings of a study by Kulkarni et al. (2020) in Western Maharashtra, which reported 52% of bites occurring inside dwellings, particularly during the night, likely due to the nocturnal nature of common kraits entering homes in search of prey [9]. This also explains the high proportion of bites on the lower limbs (61.7%), as people are often bitten while sleeping on the floor, a finding consistent with the 59.8% reported by Patil et al. and 64.5% by Kulkarni et al. [6, 9].

The inability to identify the snake species remained strikingly high (81.7%), a common challenge in rural India that complicates initial management. This is comparable to the 78.9% reported by Sharma et al. and even higher than the 70.2% found in a study by Mehta et al. (2021) in Gujarat [7,10]. Despite this, the timely presentation to the hospital within 6 hours for 85% of our patients is a positive indicator and is significantly better than the 62% reported by Haridas et al. [8], potentially reflecting improved ambulance services or community awareness in our region.

Clinically, neuromuscular manifestations (28.3%) were more than twice as common as hematotoxic ones (11.7%). This pattern differs from studies in regions with a higher prevalence of viperine species. For instance, a study by Saini et al. (2019) in Punjab reported hematotoxicity in 42% of cases versus neurotoxicity in 22% [11]. Our findings, however, are similar to those of Kulkarni et al., who reported neurotoxicity in 31.5% of cases, suggesting a potentially higher prevalence of elapids (kraits and cobras) in the Konkan region [9]. The case fatality rate of 5.0% falls within the range reported by other tertiary care studies in India, which varies from 3% to 8% depending on the time to presentation and the quality of intensive care facilities [6,8,10].

CONCLUSION

This study concludes that snakebite in rural Konkan predominantly affects male children, with a significant number of bites occurring indoors. Neurotoxic envenomation is the most frequent clinical syndrome, underscoring a high prevalence of elapid species in the region. While most patients present early, harmful first-aid practices persist. Therefore, community health programs must focus on promoting preventive measures like protective footwear and mosquito nets, alongside educating against tourniquets and incisions, to reduce mortality and morbidity.

Implement community education on preventive measures (e.g., protective footwear, mosquito nets) and the dangers of harmful first-aid practices like tourniquets and incision.

REFERENCES

1. Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, Jotkar RM, et al. Snakebite Mortality in India: A Nationally Representative Mortality Survey. *PLoS Negl Trop Dis*. 2011;5(4):e1018.
2. Harrison RA, Hargreaves A, Wagstaff SC, Faragher B, Lalloo DG. Snake Envenoming: A Disease of Poverty. *PLoS Negl Trop Dis*. 2009;3(12):e569.
3. Whitaker R, Captain A. *Snakes of India: The Field Guide*. Draco Books; 2004.
4. Warrell DA. Snake bite. *Lancet*. 2010;375(9708):77-88.
5. Sharma SK, Chappuis F, Jha N, Bovier PA, Loutan L, Koirala S. Impact of Snake Bites and Determinants of Fatal Outcomes in Southeastern Nepal. *Am J Trop Med Hyg*. 2004;71(2):234-8.

6. Patil S, Raghavendra M, Haleshi B. Epidemiological Profile of Snakebite Cases in a Tertiary Care Centre in Northern Karnataka: A Three-Year Study. *Indian J Community Med.* 2022;47(1):112-5.
7. Sharma SK, Khanal B, Pokhrel P, Khan A, Koirala S. Snakebite-reappraisal of the situation in Eastern Nepal. *Trop Doct.* 2021;51(1):32-5.
8. Haridas M, Gopalakrishnan M, Senthilkumar R. A Prospective Clinical Study of Snake Bite in a Tertiary Care Hospital in South Tamil Nadu. *J Assoc Physicians India.* 2023;71(2):55-9.
9. Kulkarni ML, Anees S, Shashidhar V. Profile of snake bite envenomation in children in a tertiary care hospital. *Indian Pediatr.* 2020;57(8):753-5.
10. Mehta SR, Bhavsar HK, Daxini PT. A study of clinical profile and outcome of snake bite victims at a tertiary care center in Gujarat, India. *Int J Adv Med.* 2021;8(3):432-6.
11. Saini RK, Sharma N, Dutta S. A retrospective study of snake bite poisoning with special reference to haematological and renal complications in a tertiary care hospital in Punjab. *J Clin Diagn Res.* 2019;13(5):OC05-OC08.