



Clinical Profile and outcome of Hemotoxic and Neurotoxic snake Bite at tertiary care hospital, SKIMS, Soura j & k India

¹Sheenam Gazala, ²Mohmad Saleem Chesti, ³Tansila Rashid, ⁴Prof.Showkat Mufti

¹Senior Resident, Sheri Kashmir Institute Of Medical Sciences(SKIMS) and Hospital, Soura J&K India

²Pediatrician,J&K Health Services.

³Post graduate Student at SMHS, Hospital J & K, India.

⁴HOD Emergency Medicine SKIMS,Soura and Hospital J&K India.

***Corresponding Author:**

Dr Sheenam Gazala

¹Senior Resident, Sheri Kashmir Institute Of Medical Sciences(SKIMS) and Hospital, Soura J&K India

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Objective:

Snake bite is a medical emergency and neglected problem more prevalent in tropical India This study was conducted to describe clinical characteristics and outcome of snakebites in a tertiary care hospital i.e SKIMS, Soura J&k India. Study design: An Obsevational retrospective, hospital based study.

Materials and methods:

85 patients of snake bite were studied from July 2015 to January 2019. Demographic data, clinical Profile, treatment details and outcome of hemotoxic and neurotoxic snake bite cases were analysed.

Results:

Out of 85 cases of snake bites ,33(38.8%) were viper bites i.e hematotoxic and 14(16.4%) were neurotoxic bites(elapid bites) , predominantly males(62.3%) were affected in the age group 14-42 years. Majority of cases were reported among farmers (57.6%), particularly from rural areas(87%). Most of cases presented during day(68.2%) and were bitten around lower limbs(61.1%) ,indicating that snake bite is an occupational hazard.

Conclusion:

Snake bite is one of life threatening emergency, timely hospitalisation with intensive emergency care is associated with good prognosis. snake bite is an occupational and rural hazard seen in farmers, labourers, herders . Public awareness programmes regarding the first aid and immediate referral to hospital must be done through electronic and print media.

Keywords: Snake-bite; North India, Envenomation ,Outcome.

INTRODUCTION

Snake bite is a medical emergency and occupational hazard, and is one of neglected public health problem particularly in tropical counties and was reported in April 2009(1) in WHO list of neglected tropical problems Worldwide Over 2,000 species of snakes are known , among them 400 are poisonous, various types of families of snakes include Viperidae, Elapidae, Colubridae and Hydrophiidae (2). Among poisonous snakebites ,Viper snake bites are more

common in human beings (3,4) and Levantine Viper also known as [Gunas] in local language is venomous viper found in jammu and Kashmir, while as in India's rural regions fatality rates due to snake bites are caused by neurotoxic bites by Kraits and Cobras (5,6),in addition Bungarus caeruleus being most dangerous species of common krait in Indian subcontinent (7). It has been reported that almost 35000 to 50,000 Indians die in 2, 50,000 cases of

snake bite every year(8) , although there is no shortage of antisnake venom(ASV) in India and also in India huge number of poisonous snakes are not found (9). While as in snakebite high fatality rate is due to wrong practices, misconceptions regarding treatment and superstitions (10,11,12).

Hemotoxic snakebites usually occur from Russell's viper, saw-scaled viper, and pit vipers. Snake venom contains different types of enzymes mostly hydrolytic and have both anti-coagulant and prothrombotic activities like fibrinolytic enzymes, prothrombin activators, platelet aggregation inhibitors. Common clinical features due to hemotoxic bite include fang marks, local pain ,local bleeding, bruising, blistering, spreading local swelling, infections while as systemic envenomation results in bleeding from various sites(epistaxis, intracranial haemorrhage) and multisystem organ involvement. Common early symptom of systemic envenomation is vomiting and in some fainting, collapsing with transient unconsciousness, while as earliest sign of hemotoxic snake envenomation is bleeding from gums or oral route. In case of neurotoxic bites ,common Indian krait (*Bungarus caeruleus*) an Indian cobra(*Naja naja*) first sign is usually blurring of vision and loss of accommodation followed by bulbar paralysis, further heralded by ptosis and ophthalmoplegia. Cobra venom usually binds to post synaptic acetylcholine receptors while as venom of common krait results in both pre and post synaptic inhibition. Haemorrhagic syndrome occurs in viperidae group (russel viper.pit viper),while as respiratory failure along with intercostal paralysis followed by flaccid paralysis occur in neurotoxic bites by elapids(common cobra, krait)(13,14)

This study was conducted to describe the clinical profile, delayed presentation of patients in hospital , and outcome of snakebites in a tertiary care hospital of northern India.

Materials And Methods

This hospital based retrospective, observational study was conducted at Sheri Kashmir Institute of Medical Sciences (SKIMS) and hospital in medical emergency ,a tertiary care hospital in north India (j&k) from July 2015 to January 2019.Snake bite cases were recorded by authors working in emergency during the study period.

Inclusion Criteria:

Patients with history of snake bite with a fang marks were included in the study and various investigations like CBC, CT,BT, PT, Electrolytes,urea,creatinine and ECG were done in all cases of snake bite

Age group between 12 to 42 years. Localised pain, local bleed, Inflammation and Gangrene.

Symptomatology of hemotoxic bites and neurotoxic bite.

Laboratory evidence of bleeding and coagulation abnormalities.

Complications and treatment received in snake bite.

Exclusion Criteria:

Patients with no fang marks.

Patients above 42 yrs of age.

Clinical profile (Age,sex,residence,time gap between snake bite and hospital admission, bite site, clinical symptoms and signs) , complications, treatment details(First aid, transport and ant venom) and outcome of the snake bite victims were analysed and recorded .Based on WHO syndromic approach an attempt was made to identify species and also the clinical characteristics. According to WHO syndromic approach Syndrome 1;Local envenoming(swelling etc.) with bleeding /clotting disturbances=Viperidae (all species),Syndrome 2;local envenoming(swelling etc.) with bleeding/clotting disturbances, shock or acute kidney injury=Russell's viper, Syndrome 3;Local envenomation(swelling etc.) with paralysis =cobra. Syndrome 4;paralysis with minimal or no local envenomation. Bitten on land while sleeping on the ground with or without pain abdomen=krait and Syndrome 5;paralysis with dark brown urine and acute kidney injury .Bitten on land with bleeding /clotting disturbances=Russell's Viper ,this syndromic approach is useful when snake has not been identified and anti-snake venom available are not specific.

RESULTS

In our study, about 85 cases of venomous snakebites were included who were hospitalised from July 2015 to january 2019, aged between 12- 42 years. Various

parameters regarding snake bite are given in tables as under:

Table 1; Age and gender distribution of victims of snake bite victims:

Age Distribution(Years)	Frequency(N)	Percentage(%)
12 to 22	20	23.5
23 to 32	41	48.2
33 to 42	24	28.2
Gender Distribution	Frequency(N)	Percentage(%)
Male	53	62.3
Females	32	37.6

Table 2:Area of living and occupation with snake bite:

Area of living	Frequency(N)	Percentage(%)
Rural	74	87
Urban	11	13
Occupation	Frequency(N)	Percentage(%)
Farmers	49	57.6
Cattle herders	16	18.8
Others	20	23.5

Table 3:Relation of Time,Season with Snake bite:

Time of Bite	Frequency	Percentage
Day	58	68.2
Night	27	31.7
Season of Bite	Frequency	Percentage
Feburary to May	11	12.9
June to September	53	62.3
October to January	21	24.7

Table 4:Snake identified or not and site of snake bite

Snake identified or not	Frequency	Percentage(%)
Identified 1.Viper(Gunas)	33	38.8
2.cobra	14	16.4
Not Identied	38	44.7
Site of Bite	Frequency(N)	Percentage(%)
Lower Extremity	52	61.1
Upper Extremity	23	27
Multiple sites	10	11.7

Table 5:Snake bite according to Fang marks.

Fang Marks(Number)	Frequency(N)	Percentage(%)
One	45	52.9
Two	24	28.2
More than Two	9	10.5
Scratches	7	8.2
Total	85	100

Table 6;Time Lag between snake bite and hospital admission.

Time Lag(Hours)	Frequency(N)	Percentage(%)
<2 hours	18	21.1
2 to 12 hours	49	57.6
12 to 24 hours	13	15.2
>24 hours	5	5.8

Table 7:patients of snake bite receiving first aid

First Aid	Frequency(N)	Percentage(%)
Torniquet	45	52.9
Suction of venom from bite site	4	4.7
Misbeliefs	8	9.4
No Treatment	29	34.1

Table 8:Clinical features of Hemotoxic snake bite

Symptomtology of Hemotoxic bite	Frequency(N)	Percentage(%)
Bleeding from bite site	31	36.4
Echymosis	9	10.5
Gum bleeding	2	2.3
Haematuria	18	21.1
Epistaxis	3	3.5
Oliguria	22	25.8

Table 9:Symptomtology of Neurotoxic bite

Neurotoxic Bite manifestations	Frequency(N)	Percentage(%)
Ptosis	32	37.6
Dysphagia	4	4.7
Ophthalmoplegia	25	29.4
Unconsciousness	5	5.8
Respiratory Paralysis	19	22.3

Table 10: Complication occurring during hospital stay in snake bite patients

Complications of snake bite	Frequency(N)	Percentage
Acute Respiratory failure	25	29.4
Hypotension	5	5.8
Acute kidney failure	15	17.6
Intracranial haemorrhage(ICH)	3	3.5
Disseminated intravascular coagulation(DIC)	6	7.05
Acute respiratory distress syndrome(ARDS)	2	2.3

Table 11: Treatment received by Hemotoxic and Neurotoxic Cases of snake bite

Treatment Received to snake bite victims	Frequency(N)	Percentage(%)
Blood components(FFP,Platelets)	15	17.6
Antisnake venom(ASV)	85	100
Hemodialysis	8	9.4
Ventilatory support (Duration)	14	16.4
<24 hours	6	7.05
>24 hours	8	9.4
Neostigmine	10	11.7

Table 12: Outcome of snake bite victims

Outcome of snake bite victims	Frequency(N)	Percentage(%)
Survived cases	80	94.1
Expired	5	4.9

Discussion

As we know, poisonous snakes mainly belong to viper family and elapid family(cobra and krait) and . The viper bites result in bleeding from the , haemolysis, acute kidney failure and bleeding from mucocutaneous site and rarely shock (15).Males being affected than females, as males are main working force in agriculture and outdoor activities. Findings of our study were consistent with other studies (16,17). Majority of snake bite cases in our study occurred during june to September(62.3%) ,mainly due to harvesting and monsoon season and due to flooding of snake habitats(18,19).

Snake bite is termed as occupational hazard,seen mostly in farmers(57.6%), cattle herders, labourers (20) as they work barefooted and stressful conditions (21). In our study maximum number of snake bite victims were from rural (87%) than urban areas which is concurrent with earlier studies (22).Besides this, major determinant of outcome due to snakebites was time interval between time of snake bite to hospital admission(23) In present study about 78.7% of snake bite victims reached hospital within 12 hours of snake bite, which along with intensive emergency management might be the reason for low mortality among snake bite victims, while as 21 % cases of snakebite were delayed due to poor transportation facility, false beliefs and lack of awareness. In addition, in our study about 67.05% of snake bite victims received first aid treatment in form of tourniquet, suction and other misbeliefs. Currently these practices are not recommended as they delay transportation of snakebite victims to hospital (17) .

Majority of snake bite cases were prey to hemotoxic variety of snakes, mostly by vipers i.e. Russell's viper and particularly Levantine viper(*Macrovipera lebetina*) locally known as Gunas in j&k. Viper bites usually manifest as local envenoming like swelling, pain, haemorrhagic manifestations such as bruising, ecchymosis ,blisters and regional lymphadenopathy, while as systemic symptoms present as nausea, vomiting,

headache and abdominal pain. Our study shows that bleeding from snake bite site was seen in 36.4% of snake bite victims followed by haematuria(21.1%) cases which is consistent with other studies(25,26) While as neurotoxic bites manifested as ptosis followed by ophthalmoplegia which is consistent with other studies (27).

Anti-snake venom (ASV) is currently main treatment modality for envenomation due to snake bites. ASV may be species specific (monovalent/monospecific) or effective against various species (polyvalent/polyspecific ,Moreover children's receive same amount of ASV as snakes inject same amount of venom in children's and adults [23].

In our study, mortality rate was 5.83% which is concurrent with other studies as reported by IF Inamdar et al, whereas mortality in our country is still higher as a result of large rural population and lack of awareness.

References:

1. World Health Organisation. Neglected tropicaldiseases:snakebites.Geneva,Switzerland: WHO;2009,<http://www.who.int/neglected-diseases/diseases/snakebites/en/index.html>[accesed August 5,2020].
2. Al-Homrany M. Acute renal failure following snake bites: a case report and review of the literature. Saudi J Kidney Dis Transpl. 1996;7:309–12. [PubMed].
3. Basu J, Majumdar G, Dutta A, et al. Acute renal failure following snake bites (viper) J Assoc Physicians India. 1977;25:883–90. [PubMed].
4. Bhat RN. Viperine snake bite poisoning in Jammu. J Indian Med Assoc. 1974;63:383–92. [PubMed].
5. McNamee D. Tackling venomous snake bite worldwide. Lancet 2001; 357:1680

6. Warrell DA. The clinical management of snake bites in Southeast Asian region. *Southeast Asian J Trop Med Public Health* 1990; 30 (suppl): 1-67
7. Theakston RDG, Phillips RE, Warrell DA, et al. Envenoming by the common Krait (*Bungarus caeruleus*) and Sri Lanka Cobra (*Naja naja naja*): efficacy and complications of therapy with Haffkine antivenom. *Trans R Soc Trop Med Hyg* 1990; 84: 301-08
8. Brunda G, Sashidhar RB. Epidemiological profile of snake-bite cases from Andhra Pradesh using immunoanalytical approach. *Indian J Med Res.* 2007;125:661-8. [PubMed]
9. Simpson ID, Norris RL. Snakes of medical importance in India: Is the Concept of the "Big 4" still relevant and useful? *Wilderness Environ Med.* 2007;18:2-9. [PubMed] .
10. Bawaskar HS. Snake venoms and antivenoms: critical supply issues. *J Assoc Phy India* 2004; 52:11-3
11. Jacob J. Snake venom poisoning: the problem ,diagnosis and management of snake venom poisoning. Bombay Varghese Publishing House, Bombay 1990
12. Simpson ID. The "worldwide shortage" of antsnake venom: is the only right answer "produce more" or is it also "use it smarter?" *Wilderness & Environ Med* 2008;19(2): 99-107
13. Virmani SK, Dutt OP. A profile of snake bite poisoning in Jammu region. *J Indian Med Assoc* 1987;85(5):132-134.
14. Parikh CK. Textbook of medical Jurisprudence, forensic medicine and toxicology. 6th New Delhi: CBS Publishers 2000
15. Reid HA, Theakston ROG. The management of snake bite. *Bull World Health Organ.* 1986;61:885-95. [PMC free article] [PubMed]
16. Saini RK, Sharma S, Singh S, Gupta VK, Pathania NS. Primary pathological fibrinolysis in saw-scaled (*Echis carinatus*) viper bites. *J Assoc Physicians India.* 1984;32:391-93. [PubMed]
17. Myint-Lwin, Warrell DA, Phillips RE, et al. The bites of Russell's viper (*Vipera russelli siamensis*) in Burma: haemostatic, vascular, and renal disturbances and response to the treatment. *Lancet.* 1985;2:1259-64. [PubMed]
18. Warrell DA. Snake bite: a neglected problem in twenty-first century India. *Natl Med J India.* 2011;24(6):321-324. [PubMed]
19. Hansdak SG, Lallar KS, Pokharel P, Shyangwa P, Karki P, Koirala S. A clinico-epidemiological study of snake bite in Nepal. *Trop Doct.* 1998;28(4):223-226. [PubMed]
20. Warrel DA. The WHO/SEARO guidelines for the clinical management of snake bite in the the Southern east Asian region. *SE Asian J Trop Med Pub Hlth.* 1999;30:1-85.
21. Sharma BD. Indian poisonous snakes: an ecological and a clinical study. New Delhi: Anmol Publications Pvt. Ltd.; 2002.
22. Hati AK, Mandal M, De MK, Mukherjee H, Hati RN. The epidemiology of snake bites in the district of Burdwan, West Bengal. *J Indian Med Assoc.* 1992 Jun 90(6):145-47.
23. Sharma SK, Khanal B, Pokharel P, Khan A, Koirala S. Snakebite-reappraisal of the situation in Eastern Nepal. *Toxicon.* 2003;41(3):285-289. [PubMed] 90(6):145-47. [Pub Med]
24. Warrell DA. Guidelines for the management of snake-bites. In: World Health Organization, Regional Office for Southern East Asia. 2010:1-162. [serial online]. Available at: www.searo.who.int/LinkFiles/BCT_snake_bite_guidelines.
25. Sharma BD. Indian poisonous snakes: an ecological and a clinical study. New Delhi: Anmol Publications Pvt. Ltd.; 2002.
26. Sarangi A, Jena I, Sahoo H, Das JP. A profile of snake bite poisoning with a special reference to the haematological, renal, neurological and the electrocardiographic abnormalities. *J Assoc Physicians India.* 1977;25:555-60. [PubMed]
27. Seneviratne U, Dissanayake S. The neurological manifestations of snake bite in Sri Lanka. *J Postgrad Med.* 2002;48:275-78. [PubMed]
28. Howarth DM, Southee AS, Whytw IM. The lymphatic flow rates and the first aid in simulated peripheral snakes or in spider envenomation. *Med J Australia.* 1994;161:695-700. [PubMed]

29. Inamdar IF, Aswar NR, Ubaidulla M, Dalvi SD. Snakebite: Admissions at a tertiary health care centre in Maharashtra, India. *S Afr Med J*. 2010;100:456–58. [PubMed].