



THE ROLE OF TIMELY ADMISSION OF PATIENTS WITH SNAKEBITE AND ITS IMPACT ON MORTALITY AND MORBIDITY

General Medicine

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ABSTRACT

Background- Snake bite envenomation is a major health issue, particularly in rural India and a common, acute life threatening medical emergency. **Aims And Objectives-** To study the clinical profile of snake bite with reference to age, sex, occupation, site and time of bite, delay in admission, requirement of respiratory support and outcome. **Material And Methods -** This study was a prospective observational study of 100 patients of snakebite with features of neurotoxicity who were admitted in Intensive Care Unit. Patients with hematoxicity were excluded. They were clinically assessed and managed by anticholinesterases, anti snake venom (ASV) and ventilation for respiratory paralysis as and when necessary. The clinical profile of patients with neurotoxic snake envenomation was studied. The data were recorded in a pretyped proforma which was finally analysed using SPSS software. **Results-** Out of 100 cases 71 (71%) were males and 29 (29%) females. 39% visited traditional healers prior to admission. 72% presented with tourniquet. Bite marks were present in 75 % cases only therefore bite marks cannot always be relied upon for diagnosis of snakebite. 78 (78%) required 20 vials of ASV. 64 percent developed respiratory paralysis and required ventilator support. Mean duration of ventilation was 29.7 hours and the mean duration of hospitalization in a neurotoxic bite was 5-7 days. Renal and cardiac derangements were also observed. It was also observed that those who presented early within 6 hours of bite had shorter hospital stay and favourable outcome. Mortality was 3%. **Conclusion-** We conclude, that timely admission, administration of anti-venom therapy and institution of ventilatory support for those who needed was associated with an excellent outcome.

KEYWORDS

Snakebite Envenomation Respiratory paralysis, Ventilation

INTRODUCTION-

Snakebite is an occupational, domestic and environmental hazard affecting mostly males. It is a common medical emergency encountered all over India. It is almost completely treatable if treated in time with anti snake venom and ventilator support if needed. Optimal dose of anti snake venom required is not known.² Immediate steps should be taken to shift the victim to the hospital as early as possible. Traditional healers should be avoided to reduce the time lapse or delay in admission. This can only be checked by spreading awareness and educating the public. Snake envenomation is a major health issue, particularly in rural India. In spite of high morbidity and mortality, very little attention is being paid to this clinical hazard. Some of the other factors like shortage of antivenoms, poor health infrastructure, underreporting of cases, worsen the situation. This article discusses on the importance of timely presentation of snakebite in a well equipped facility and timely institution of treatment for desired outcome.

MATERIAL AND METHOD

This study was a prospective observational study conducted between March 2020 to September 2021 in Department of Medicine, G.R. Medical College, J.A. group of Hospital Gwalior. 100 patients of snakebite with features of neurotoxicity were admitted and included as subjects after obtaining consent from relatives of patient. The clinical profile of patients with neurotoxicity was studied. Patients with hematoxicity were excluded.

All patients with neurotoxicity were administered, not more than 20 vials of anti snake venom (ASV), neostigmine and supportives. These patients were assessed from time to time for intubation and ventilation.

Criteria for intubation and ventilation were bulbar paralysis with dysphonia and inability to speak, difficulty swallowing and drooling of saliva, inability to hold neck or if presenting with shock.

Detailed information regarding demographic parameters including age, sex, residence, site of bite, time of bite, tourniquets, treatment from traditional healer, time interval between bite and arrival in hospital, total amount of ASV infused, ventilator requirement, hospital stay, neurological recovery and hospital survival was evaluated. All these informations were filled in a pretyped proforma and the data of 100 cases were analysed using SPSS software.

RESULTS

100 patients were selected as cases. Males 71 (71%) outnumbered 29 (29%) females. Snake bite was more common among rural population 70 (70%) versus urban 30 (30%).

Most of the patients 78 (78%) presented in hospital with tourniquet applied proximal to site of bite.

Bite marks were visible in 75 (75%) of patients.

Bites mainly occurred at night 59 (59%) while day time bite was found in 39 (39%) and there was no clue in 2 (2%) cases. Lower limb was the most common site of bite 66 (66%) followed by upper limb 24 (24%).

10 (10%) of patients had bite over uncommon sites like trunk 7 (7%), head and neck 3 (3%).

39 (39%) patients took treatment from traditional healers before hospitalisation.

Mean time interval between bite and arrival in hospital was 4.5 hours.

Proptosis 100 (100%) was the most common presenting feature of neurotoxicity followed by external ophthalmoplegia 92 (92%).

78 (78%) of patients who presented with signs and symptoms of neurotoxicity required 20 vials of ASV and 22 (22%) required 10 vials.

Deranged renal function profile was found to be present in 18 (18%) patients. Leucocytosis was present in 17 (17%) of patients.

Most common abnormal ECG finding seen in patients of snake bite was tachycardia (68%).

64% of patients presenting with neurotoxicity developed respiratory paralysis and required ventilator support.

Mean duration of hospitalisation in a patient presenting with neurotoxic feature was 5-7 days.

It was observed that those who presented early in emergency had

favourable outcome in terms of hospitalization and outcome. Mortality was 3 (3%).

Table No-1 Distribution Of Cases According To Treatment Received From Traditional Healers

Treatment from traditional healer	No. of patients	Percentage
Yes	39	39
No	61	61

LEGEND TABLE NO-1

39% of patients visited traditional healers before admission.

Table No-2 Distribution Of Cases According To Patients Presenting With Tourniquet In Hospital

Tourniquet Applied	No. of patients	Percentage%
Yes	72	72
No	28	28
	100	100

LEGEND TABLE NO-2

78% patients presented in hospital with tourniquet

Table No-3 Correlation Of Delay In Admission To Duration Of Hospitalization

Bite To Hospital Time	Duration Of Hospitalization >7 Days	Duration Of Hospitalization < 7 Days	Fisher Exact Test
>6 hrs	4(80%)	7(7.3%)	p value .0004
< 6 hrs	1(20%)	88 (92.7%)	
total	5	95	

LEGEND TABLE NO-3

Delay in hospitalization was associated with prolonged hospitalization.

Table No-4 Correlation Between Duration Of Ventilation With Patients Outcome

Duration of intubation	Expired	Recovered	Fisher exact test (p value)
>36 Hr	2(66.7%)	4(6.5%)	.0214
<36 Hr	1(33.3%)	57(93.4%)	
Total	3(100%)	61(100%)	

LEGEND TABLE NO-4

Shorter period of ventilation was associated with favorable outcome

Table No-5 Correlation Of Delay In Admission With Duration Of Ventilation.

Bite to hospital time	Duration of ventilation > 6 hours	Duration of ventilation < 6 hours	Fisher exact test p- value
>6 hours	4 (66.7%)	7 (12%)	0.0064
< 6 hours	2 (33.7%)	51(88%)	
TOTAL	6(100 %)	58 (100%)	

LEGEND TABLE NO-5 Delay in admission was associated with prolongation in ventilation.

Table No-6 Correlation Of Delay In Hospitalization With Patients Outcome.

Bite to hospital time	Expired	Recovered	Fisher exact test (p value)
>6 hours	2 (66.7%)	9(9.2%)	.0313
< 6 hours	1 (33.3%)	88 (90.8%)	
Total	3(100%)	97(100%)	

LEGEND TABLE NO-6

Timely admission was associated with favorable outcome.

DISCUSSION

Snakebite is an occupational and environmental hazard affecting mostly males 71 (71%) in our study. 70 (70%) snakebite cases were from rural areas and rest 30% from urban area. 39 (39%) visited traditional healers prior to hospitalization. TABLE NO-1. 78(78%) patients presented in hospital with tourniquet. TABLE NO-2.

Most of the patients of snake bite were in the age group 20-50 years, and they constituted (76%) cases, which is comparable to previous

studies where (67.4%) of the snake bite victims were in the age group between 15 and 45 years.^{1,3}

Snakebite occurred mostly in lower extremity (66%) followed by upper extremity (24%). These results were consistent with A Bhalla et al (50% lower limb and 20% upper limb.⁴ 59 (59%) suffered bite during night, 39(39%) during day time and 2 (2%) patients had no idea regarding the time of bite. These results were almost similar to Sharma C et al (65.6% in night).⁵ Evening and night bites are more common because of agricultural activity.

Fang marks were visible in 75% of the patients only. This indicates that fang marks may not always be present in a case of snakebite therefore reliance on history and clinical features is of utmost importance.

Delay in hospitalization was associated with prolonged hospitalization. TABLE NO-3

Leucocytosis was present in 17(17%) cases of snakebite. Neutrophil count is elevated due to the inflammation whereas, lymphopenia occurs in response to physiological stress. Neutrophils, being an important component of the innate immunity and the first leukocytes to reach the site of venom-induced tissue damage, takes part in the complex series of events that characterize snakebite envenomings.⁷

The most common ECG finding was sinus tachycardia (68%) which may be due to anxiety, 22% patients had normal ECG finding, 14% had ST-T changes due to myocardial injury, 4% had bradycardia and in 1% patients A-V block was seen. ECG can be a useful tool to detect the impact of snake venom on cardiovascular system.⁸

Acute kidney injury was observed in 18% patients. In a study by Harshavardhan L et al it was found that 14.6% had acute kidney injury. 64 (64%) patients of snakebite developed respiratory failure and required mechanical ventilation. Similarly in a study by Bhalla G et al (71.42%) needed ventilatory support.¹⁰

78 (78%) required 20 vials ASV and the rest 22 (22%) 10 vials as infusion. The optimal dose of ASV is not known.²

Most of the patients who required ventilator support required ventilation for 24-36 hours. Mean duration of ventilation was 29.7 hours. This result is also consistent with A Bhalla et al where these patients required ventilation for (34.6 ± 12.8 hours). Mechanical ventilation was required for a median duration of 17 hours by Agarwal PN et al.¹¹

Shorter period of ventilation was associated with favorable outcome TABLE NO-4

Amongst those who arrived within 6 hours of bite 88% required ventilation for less than 36 hours compared to those who presented more than 6 hours after bite. (p-value=.0064 i.e. statistically significant). Early presentation was associated with shorter period of ventilation. Timely admission was associated with favorable outcome. Delay in admission was associated with prolongation in ventilation. TABLE NO-5

Amongst those who survived 91.8% were weaned off in less than 36 hours whereas 66.7% in the expired group required ventilation for more than 36 hours. (p-value=.0214 i.e. statistically significant). This shows that longer duration of ventilation may be associated with unfavourable outcome.

Mean duration of hospitalization was 5-7 days similar to A Bhalla et al (6±1.6 days). Snakebite cases who arrived within 6 hours required less than 7 days (shorter duration) of hospitalization. 80% patients who were hospitalized for more than 7 days, presented in hospital after a delay of more than 6 hours, on the other hand (92.7%) patients hospitalized for less than 7 days had arrived within 6 hours of bite (p-value=.0004 i.e. statistically significant). This shows that delay in admission may prolong hospitalization.

Mortality was 3 (3%). In the expired group, 66.7% presented more than 6 hours after bite. Out of 97 patients who recovered 88(90.8%) arrived within 6 hours of bite. (p-value=.0313 i.e. statistically significant). Timely admission was associated with favorable outcome. TABLE NO-6

Effective interventions including education and adequate antivenom provision would reduce snakebite deaths in India.¹² Timely arrival of snakebite cases may shorten the duration of hospitalization, duration of ventilation and ultimately lead to favourable outcome. Our study clearly suggests the significance of early arrival.

CONCLUSION

We conclude, that the timely admission, judicious administration of anti-venom therapy and institution of ventilatory support if needed in snakebites is associated with an excellent outcome. We need to educate the mass regarding the importance of prompt transfer to an appropriate facility where antivenom therapy and ventilatory support can be instituted in a case of snake bite.

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