



ORIGINAL RESEARCH PAPER

Paediatric Medicine

A STUDY OF DEMOGRAPHIC PROFILE AND CLINICAL OUTCOME OF SNAKE BITE IN CHILDREN IN A TERTIARY CARE HOSPITAL, IN SOUTH INDIA

KEY WORDS: Snake bite, Paediatric, snake bite envenomation, ASV, neglected tropical disease

Dr Soumya B Mallasure

Junior Resident MBBS Paediatrics Bangalore Medical College And Research Institute Krishna Rajendra Road, Kalasipalya Bangalore 560002

Dr Sahana Devadas

Professor And Head Of The Department MBBS, MD Paediatrics, FIPM Paediatrics Bangalore Medical College And Research Institute Krishna Rajendra Road, Kalasipalya Bangalore 560002

ABSTRACT

Introduction: Snakebite is one of the neglected tropical diseases that the World Health Organization aimed to eradicate [1]. However, it has been excluded from WHO report of 2010 and 2013 on neglected tropical diseases. Currently, snakebite has been included along with other neglected non-tropical diseases such as strongyloidosis, scabies, mycetoma, etc [2,3]. Unlike the other public health problems, which have received a lot of attention from both the policy makers and health care providers, snake bite has been grossly neglected by many. Hence, the current study was conducted with the objective of assessing the clinical and epidemiological profile of snake bite victims admitted to a tertiary care hospital. **Objective:** To assess the clinical outcome and demographic profile of snake bite in children. **Materials And Methods:** This is a retrospective observational study of 30 patients admitted to Vanivilas Children's Hospital, attached to Bangalore Medical College and Research Institute, Bengaluru, with a history of snake bites during the study period between January 2023 & August 2023. Clinical data of these children were analysed for demographic details, type and site of the bite, kind of snake, clinical presentations, requirements for ASV, complications, duration of hospital stay and outcomes were analysed. **Results:** Males had higher incidence of snake bites (n=17, 56.7%). Higher incidence was noted in the age group of above 10 years old children with 19 patients (63.3%). Lower extremity was the most common site of bite with 25 patients (83.3%). Most common clinical features at presentation were local edema and pain found in 12 patients (40%). Cellulitis (n=10, 30%) was found to be the most common complication. 26 patients (86.7%) were discharged with no residual complications and one death was noted in the patient with uncontrolled, frank systemic bleeding at presentation. **Conclusions:** Snake bite still remains a major public health problem in this part of the world. Awareness has to be raised regarding the presentation of snake bites through community health programmes.

INTRODUCTION

Snakebite is one of the neglected tropical diseases that the World Health Organization aimed to eradicate [1]. However, it has been excluded from WHO report of 2010 and 2013 on neglected tropical diseases. Currently, snakebite has been included along with other neglected non-tropical diseases such as strongyloidosis, scabies, mycetoma, etc [2,3]. The increased mortality and morbidity in tropical countries is attributed to scarcity of anti-snake venoms, minimum access and poor quality of health care services [4]. People in countries like India prefer traditional healers rather than trained doctors, mainly because of ignorance and monetary issues as a result of which 77% of snake bite victims in rural areas die outside the health care setup [5].

Since complications of snakebite develop rapidly and irreversibly, medical interventions must be prompt and appropriate [6]. Even though deaths due to snake bite can be prevented, the mortality continues to be high. Even though deaths due to snake bite can be prevented, the mortality continues to be high because of lack of knowledge among doctors regarding the management of snake bite cases, this along with delay in conventional treatment, lack of anti snake venom and lack of facilities of tracheal intubation and ventilation by bag-valve mask in neurotoxic cases have been major factors for death due to snake bites [8].

Unlike the other public health problems, which have received a lot of attention from both the policy makers and health care providers, snake bite has been grossly neglected by many. Hence, the current study was conducted with the objective of assessing the clinical and epidemiological profile of snake bite victims admitted to a tertiary care hospital hence increasing the awareness among the clinicians and general public about the need for timely and appropriate treatment and preventable mortality and morbidity due to snake bite.

Objective Of The Study

To assess the clinical outcome and demographic profile of

snake bite in children.

MATERIALS AND METHODS

This is a retrospective observational study done using the case record files of patients admitted to Vanivilas Children's Hospital, attached to Bangalore Medical College and Research Institute, Bengaluru, with history of snake bites during the study period between January 2023 & August 2023. All children <18 years admitted to the hospital with alleged history of snake bite during the study period were included in the study.

Clinical data of these children were analysed for demographic details, type and site of the bite, kind of snake, the indication of ASV, time to receive first aid and the first dose of ASV, the total quantity of ASV received, adverse events related to ASV administration, clinical features at the time of presentation (local symptoms and signs, haematological and neurological manifestations), laboratory profile (whole blood coagulation time, complete blood count) were recorded in the proforma.

The patients were monitored for complications. Dialysis, ventilator support, and blood product transfusions were performed as needed. Patients who developed severe cellulitis were referred to a surgeon for necessary treatment and given the appropriate antibiotics. The duration of hospital stay and conditions at the time of discharge were noted. Study outcome was noted as discharge with or without complications, or death.

Data was analyzed using SPSS 19 software. Descriptive statistics of the explanatory and outcome variables will be calculated by mean, standard deviation, median and IQR (based on data distribution) for quantitative variables, frequency and proportions for qualitative variables. Inferential statistics like the Chi-square test were applied to qualitative variables. The level of significance was set at 5%.

RESULTS

30 children were admitted to the Vanivilas Hospital, Bengaluru with alleged history of snake bite during the study period, of which 17 (56.7%) were males and 13 (43.3%) were females.

Almost two thirds of the snake bite incidence was noted in the age group of above 10 years old children with 19 patients (63.3%). Lower extremity was the most common site of bite with 25 patients (83.3%. The offending snake species was unidentified in more than half of the patients (n=17,56.7%). Among the identified species of snakes (n=13, 43.3%), the commonest was the viper bite in 7 (23.3%)patients, followed by rat snake bite and krait bite in 3 patients each (10%). 18 (60%) patients presented to the hospital within 6 hours of the bite, whereas 12 (40%) patients came to the hospital after 6 hours with a mean time since the bite to the hospital of 6.42 hours.

Table No.1: Epidemiological And Demographic Details

VARIABLES	PATIENTS	PERCENTAGE	p VALUE
Total patients	n=30	100%	
Age in years			> 0.01
0-5 years	6	20%	
6-10 years	5	16.7%	
>10 years	19	63.3%	
Sex			>0.01
Male	17	56.7%	
Female	13	43.3%	
Bite Site			<0.0001
Lower Extremity	25	83.3%	Significantly higher
Upper Extremity	4	13.3%	
Others	1	3.3%	
Type of offending Agent/ Snake Bite Species			>0.01
Unidentified species	17	56.7%	
Viper bite	7	23.3%	
Rat snake bite	3	10%	
Krait bite	3	10%	

Various clinical presentations of patients were noted. Most common clinical features at presentation were local edema and cellulitis found in 12 patients (40%). 11 patients (36.7%) presented with hematotoxic signs of bleeding manifestations such as hematuria, increased whole blood clotting time, AKI or frank systemic bleeding. 2 patients presented with respiratory depression and 1 patient had drooping of eyelids suggestive of neurotoxic signs in these 3 (10%)patients.

More than half of the snake bites were found to be non-toxic in nature (n= 16, 53.3%), with 11 (36.6%) being hemotoxic and 3 (10%) patients suffered from neurotoxic bites. 17 (56%) patients were administered with IV Antibiotics in the form of Amoxicillin & Clavulanic acid (n=14, 46.7%) or Ceftriaxone (n=3, 10%). Intravenous ASV was administered in 14 patients (46.7%) with 8 (26.7%) patients requiring 20 vials of ASV and 30 vials in 5 patients (16.7%). 2 patients (6.6%) developed ASV related complications such as hypotension and respiratory distress. Cellulitis (n=10, 30%)was found to be the most common complication, of which 3 patients developed Compartment syndrome requiring surgical intervention. Of the the 3 patients who developed compartment syndrome needing debridement, 2 patients ended up with gangrene of the digits requiring toe amputations. Other complications such as respiratory paralysis were noted in 2 patients. AKI, Frank systemic bleeding, Visual loss due to third cranial nerve palsy & panic attack were noted in one patient each. Mean duration of hospital stay was noted to be 4.7 days, varying from 1 day to a maximum of 15 days. 26 patients (86.7%) were discharged with no residual complications, 2 patients underwent toe amputations, one patient had a visual loss and one death was noted in the patient with uncontrolled, frank systemic bleeding at presentation.

Table No. 2: Clinical features, complications & clinical outcomes

VARIABLES	PATIENTS	PERCENTAGE	p VALUE
Time from the snake bite to presentation at hospital			>0.01
Less than 6 hours	18	60%	
More than 6 hours	12	40%	
Mean time of snake bite to hospital: 6.42 hours			
Clinical features			>0.01
Local edema	12	40%	
Pain	12	40%	
Respiratory depression	3	10%	
Drooping of eyelids	1	3.3%	
Local site Bleeding	2	6.6%	
Hematuria	1	3.3%	
Frank systemic bleeding	1	3.3%	
Panic Attack	1	3.3%	
AKI	1	3.3%	
Asymptomatic	6	20%	
Types of bites			>0.01
Hemotoxic	11	36.7%	
Neurotoxic	3	10%	
Non Toxic	16	53.3%	
ASV Administration			
Number of patients requiring ASV	14	46.7%	
ASV 10 vials	1	3.3%	
ASV 20 vials	8	26.6%	
ASV 30 vials	5	16.7%	
COMPLICATIONS			>0.01
Cellulitis	10	30%	
Compartment Syndrome	3	10%	
Gangrene of Digits	2	6.6%	
Visual Loss	1	3.3%	
ASV related complications	2	6.6%	
Mean Duration of Hospital Stay: 4.7 Days			
OUTCOMES			<0.01
Discharged without residual complications	26	86.7%	Significant
Discharged with residual complications	3	10%	
Death	1	3.3%	

DISCUSSION

Snake bite is an environmental hazard and a life threatening emergency associated with significant mortality and morbidity in India. Our study included 30 children with snake bite envenomation. Majority were in the age group of more than 10 years (63.3%). In a study by Kshir sagar VY^[3] about snake bite envenomation in 162 children in Maharashtra, children over 5 years were more commonly involved. In the study conducted by Helen J Mead^[9] about the clinical profile of snake bite envenomation in 156 children, the mean age was 6 years.

Our study showed that more common victims in children were males (56.7%) when compared to females. Similar observation was made by Karunanayake RK^[10] in a study on 54 children with snake bite envenomation.

The most frequently bitten site in our study was the lower extremity (85.2%). Similar observations have been made in other studies^[9,10]. Children who inadvertently agitate a snake while playing in the fields or outside their homes can sustain bites to their lower limbs.

Most common nonpoisonous snake in our area was the rat snake. Among the identified poisonous snake bites, Viper was the commonest, about 20.4%. Kulkarni ML^[11] did a study on

snake venom poisoning in 633 children in Central Karnataka, in which Viper was the most common poisonous snake involved in 80%. Most venomous snakes belong to the families Elapidae or Viperidae.

In a study done by Sankar J^[12] on snake envenomation among 110 children in a teaching hospital, 64.2% had predominantly haematotoxic envenomation, 18% neurotoxicity and 16% local involvement. Our study found that majority of the bites were non-toxic with only local symptoms (53.3%) followed by haematotoxic bites (36.7%)

Anti snake venom (ASV) was administered in 14 (46.7%) children. More than half of which required 20 ASV Vials. In a study done by Gautam P^[13] on snake envenomation in 60 children at Himachal Pradesh, the average number of ASV vials used were about 20. The four main species—cobra, krait, russell viper, and saw scaled viper—are effectively combatted by the current polyvalent ASV. However, envenomation can also occur from a variety of different species, such as the Hump-nosed Pit Viper, which typically does not react well to current antivenoms.

CONCLUSIONS

- Snake bite still remains a major public health problem in this part of the world. Awareness has to be raised regarding the presentation of snake bites through community health programmes.
- Snake bite as a medical emergency should be dealt by aggressive management of the ABC's and immediate transfer of the victim to the hospital for neutralization of the venom by ASV. Improper first aid, delay in reaching hospital, unavailability of ASV worsens the outcome.
- More studies are needed with regard to the rationale use of ASV.
- A national programme is the need of the hour. In India, no reliable statistics are available. To remedy the deficiency in reliable snake bite data, it is strongly recommended that snake bites should be made a specific notifiable disease.

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