

Original Research Article

A clinical profile of poisonous snake bite in children of North Kerala, India

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ABSTRACT

Background: Snake bite is a common medical emergency and underestimated public health problem causing significant morbidity and mortality worldwide. Poisonous snake bite is a common problem in north Kerala and a significant number of children are bitten by snakes every year. Majority of studies in this respect have been done on adult snake bite victims and only limited studies are available based on poisonous envenomation in children in our region. The clinical profile of snake bite in children can differ significantly from adult snake bite victims so study was conducted to find the clinical profile of poisonous snake bite in children less than fifteen years.

Methods: This was a descriptive cross-sectional study conducted in a tertiary care academic institution located in the northern part of Kerala from December 2009 to November 2010. All children less than 15 years with poisonous snake bite were included in this study. Patients with non-poisonous bite, without signs of envenomation and with pre-existing bleeding and renal disorders were excluded.

Results: There were fifty cases of poisonous snake bite and among them 76% were males and 24% were females. The highest numbers of bites (50%) occurred in the age group between 11-15 years. Maximum number of snake bite occurred during the months of June and July. The majority of the bites occurred during night between 6 pm to 9 pm (42 %). Among the identified venomous bite Viper accounted for the highest number (48%), followed by Krait (12 %) and Cobra (4%). Lower extremities were the most observed bitten part of the body (82%) and the commonest site was foot. Eighty-four percentage of victims reached hospital within 6 hours of snake bite. The most common clinical manifestation was local pain (94%) followed by swelling (90%) and regional lymphadenopathy (82%). Majority had hemotoxicity (94%) and neurotoxicity (6%) was comparatively lesser in our study. Most common complication was overt bleeding manifestations (14%) followed by gangrene of bite site (8%), acute kidney injury (6%) and respiratory paralysis (2%). Thirty eight percent of cases required more than 10 vials of ASV and reaction to ASV occurred in 40% of cases. No mortality occurred during this study period.

Conclusions: Poisonous snake bite is a common life threatening medical emergency in our region. Morbidity and mortality due to this can be reduced by early administration of anti-snake venom and prompt recognition and management of complications. So, prompt referral of children with poisonous snake bite to centres where facilities in managing snake bite is crucial in preventing mortality.

Keywords: Anti-snake venom, Poisonous snake bite, Snake bite

INTRODUCTION

Snake bite is a common medical emergency and underestimated public health problem causing significant morbidity and mortality worldwide. There are about 216 species of snakes in India, of which around 52 are known to be poisonous. The major families of poisonous snakes in India are Elapidae which includes common cobra, king cobra and common krait; Viperidae include Russell's viper, saw scaled viper and pit viper; and hydrophidae.¹ In Kerala among the 104 species known thirty seven are poisonous. Envenomation and deaths resulting from snakebites is an important public health problem in the rural tropics. Populations in these regions experience high morbidity and mortality because of poor access to health services and due to scarcity of anti-venom, which is the only specific treatment.² The highest burden of snake envenomation exists in South Asia, Southeast Asia, and sub-Saharan Africa. It has been estimated that 5 million snake bite cases occur worldwide every year, causing about 100,000 deaths.³ On an average, nearly 2,00,000 persons fall prey to snake-bite per year in India and 35,000-50,000 of them die every year.⁴ A significant number of children are bitten by snakes every year in our region. Majority of studies done in this respect have been done on adult snake bite victims and only limited studies are available based on poisonous envenomation in children in our region. The profile of snake bite in children can differ significantly from adult snake bite victims so we conducted this study to find the clinical profile of poisonous snake bite in children less than fifteen years.

METHODS

This was a descriptive cross sectional study conducted in a tertiary care academic institution located in the northern part of Kerala from December 2009 to November 2010. All patients of age less than 15 years with poisonous snake bite with signs of envenomation admitted in paediatric wards and intensive care unit were included in this study. Patients with non-poisonous bite, without signs of envenomation and with pre-existing bleeding and renal disorders were excluded. A detailed history and physical examination was done on admission and on day to day basis till discharge. Polyvalent Anti-Snake Venom was given as per IAP recommendation. In this study the characteristics of snake bite according to the time and month of bite, site of bite, place of bite, species of snake that caused the bite, time taken to reach the hospital, clinical features, complications and vials of ASV used were recorded.

Statistical analysis

Data were analyzed using computer software, Statistical Package for Social Sciences (SPSS) version 10. Data were expressed in its frequency and percentage. To elucidate the associations and comparisons between different parameters, Chi square (χ^2) test was used as non

parametric test. Students 't' test was used to compare all parametric data. For all statistical evaluations, a two-tailed probability of value, <0.05 was considered significant.

RESULTS

There were fifty cases of poisonous snake bite in children less than 15 years; 76% were males (n=38) and 24% (n=12) were females. The highest numbers of bites (50%) occurred in the age group between 11-15 years. Thirty four percentage of bite occurred in the age group 7-10 years and 16% below 7 years (Table 1).

Table 1: Demographic profile of snake bite in children.

Variables	N=50	Percent
Age (years)	Frequency	
<7	8	16
7-10	17	34
11-15	25	50
Gender		
Male	38	76
Female	12	24
Time of bite		
00.00 -12.00	13	26
12.01-18.00	12	24
18.01-21.00	21	42
21.01-24.00	4	8
Time to hospital		
<6 hours	42	84
6-24	8	16
Snake		
Viper	24	48
Krait	6	12
Cobra	2	4
Unknown	18	36

Maximum number of snake bite occurred during the months of June (24%) and July (16%), together constituting 40% of the total. Another peak was observed during October (12%) (Figure 1).

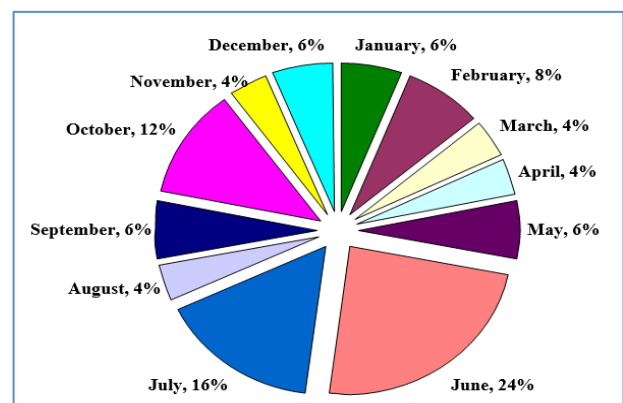


Figure 1: Distribution of bite incidence.

Among the identified venomous bite Viper accounted for the highest number (48%), followed by Krait (12 %), Cobra (4%) and species unidentified in 36%. Majority of the bites occurred during night between 6 pm to 9 pm (42 %) followed by 24 % between 12.00 pm– 6pm and 14% between 6 am-12 am. Eighty four percentage of victims reached hospital within 6 hours of snake bite and the rest 12% reached within 24 hours. Lower extremities were the most observed bitten part of the body (82%) and the commonest site was foot. The most common clinical manifestation was local pain (94%) followed by swelling (90%), regional lymph node enlargement (82%), bleeding from bite site in 22% and ecchymosed at site of bite in 14%. Among the fifty patients, 48% had vomiting and 32% of patients had abdominal pain as constitutional symptoms. In this study majority had hemotoxicity (94%) and neurotoxicity (6%) was comparatively less. Haematological manifestations observed were hematuria (12%), hemetemesis (6%), gum bleeding (2%) and epistaxis (2%). Neurological manifestations observed were ptosis (6%), ophthalmoplegia and diplopia (6%), dysarthria (6%), and respiratory paralysis (2%). Renal manifestations observed were oliguria in 8% of cases and anuria in 2% (Table 2).

Table 2: Clinical profile of patients.

Variables	Frequency	Percent
Site of bite- LL	41	82
Site of bite - UL	9	18
Local pain	47	94
Local edema	45	90
Local bleeding	11	22
Regional lne	41	82
Abdominal pain	16	32
Vomiting	24	48
Hematuria	6	12
Oliguria	3	6
Hemetemesis	3	6
Ptosis	3	6
Ophthalmoplegia	3	6
Respiratory paralysis	1	2

Among the fifty cases 12 % had thrombocytopenia with platelet less than 1.5 lakhs, 64 % had prolonged PT/INR and 48 % had prolonged activated partial thromboplastin time. Among them eighteen percentage cases received pre-hospital treatment. Out of the 50 cases, 38% required more than 10 vials of ASV and 62% required 10 or less than 10 vials. ASV reaction occurred in 20 patients. FFP was given in 22% of cases and 3cases of acute kidney injury required dialysis. Three cases of neurotoxin related envenomation required neostigmine and one case required assisted ventilation. Twenty cases (40%) developed reactions to ASV which was managed by antihistamines, adrenaline and steroids. Most common complications noted in our study was overt bleeding manifestation (14%), followed by Gangrene of bite site in 8%, acute kidney injury in 6% and Respiratory paralysis in 2% (Figure 2).

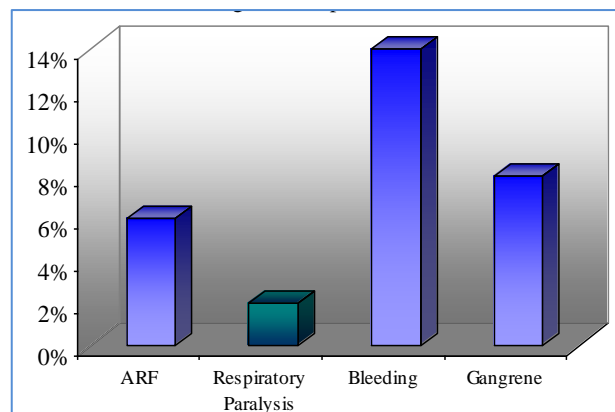


Figure 2: Complications due to snake bite.

DISCUSSION

A total of fifty cases with poisonous snake bite in children less than fifteen years were enrolled in this study. The commonest age group was between 11-15 years which accounted for 50% of the total cases and 84% of bite occurred in children above 7 years. Out of this 38 (76%) cases were males and 12 (24%) were females. This gender difference and age group reflects the difference in the outdoor activities of male children making them vulnerable to snake bite. Similar observations were reported by Kshirsagar VY et al in a study conducted in children below 15 years from rural areas of Maharashtra out of the 162 patients, 60.49% were males and 89% were above the age of five years. In a study conducted by Karunanayake et al in Sri Lanka highest numbers of bites (48%) were in the range of ages 6-12 years.⁵ Maximum number of snake bite occurred during the months of June (24%) and July (16%), together constituting 40% of the total. Another peak was observed during October (12%). This incidence of snakebite shows a distinct seasonal pattern closely related to rainfall and the peak incidences coincides with the rainy season in Kerala. Snakebites and snakebite fatalities peak during the monsoon season in India and worldwide, probably reflecting agricultural activity, flooding, increased snake activity, and abundance of their natural prey.⁶ Among the identified venomous bite Viper accounted for the highest number (48%), followed by Krait (12 %), Cobra (4%) and species unidentified in 36%. The five common poisonous snakes found in Kerala are Indian Cobra, King Cobra, Russell's viper, Saw-scaled viper and Krait. King Cobra usually habit in dense forests and rarely comes in contact with humans, so bite is very rare. Bites due to pit viper are also common in this part of Kerala.

As in similar other studies lower extremities were the most observed bitten part of the body (82%) in the present study and the common site was the foot. In our study, the maximum incidence of snakebite occurred between 6:00pm and 9:00pm accounting 42% of the total envenomation mostly attributed to poor visibility in dark and accidental stepping on the snake most which are

nocturnal in feeding habit. This diurnal variation was noted in similar other studies like Bhalla et al in his study with 72.6% bite occurring during night time and Karunanayake et al with 59% bites occurring between 6 pm to 6 am.⁷ More than half of the victims (84%) were admitted to the hospital within 6 hours of snakebite. This helped in the early administration of anti-snake venom in appropriate doses and thereby reduced the risk of developing fatal complications. This is reflected in the morbidity and mortality outcome in our study. In a study done by Kshirsagar VY et al in 162 children less than 15 years from rural Maharashtra, 32.71% patients presented beyond 6 hours after the bite. Due to the delay in seeking treatment all the 3 mortalities occurred in the group presenting beyond 6 hours of the bite. Sharma *et al.*; found that median bite to hospital time in their study group was 9 hrs and delayed arrival was associated with ARF.⁸ Suchithra N et al, stated in their study of Clinical profile and factors involved in adverse outcomes of snakebite envenoming conducted in our state; higher rates of complications were seen in those who received ASV late.⁹ All these studies emphasises the importance of prompt administration of ASV in preventing mortality and morbidity. The most common clinical manifestation in our study was local pain (94%) followed by swelling (90%), regional lymph node enlargement (82%), bleeding from bite site in 22% and ecchymosed site of bite in 14%. Swelling of the affected limb was the most common presenting sign in our study and our findings were similar to the previous study done by Maduwage et al and others.¹⁰ Among the fifty patients, 48% had vomiting and 32% of patients had abdominal pain as constitutional symptoms. In this study majority had hemotoxicity (94%) and neurotoxicity (6%) was comparatively less. This finding is consistent with the profile of the species of snakes in this region, predominant being Viperidae. Haematological manifestations observed were hematuria (12%), hematemesis (6%), gum bleeding (2%) and epistaxis (2%). Neurological manifestations observed were ptosis (6%), ophthalmoplegia and diplopia (6%), dysarthria (6%), and respiratory paralysis (2%). One patient with cobra bite developed respiratory failure which required mechanical ventilation. Renal manifestations observed were oliguria in 8% of cases and anuria in 2%. Three patients with acute kidney injury needed hemodialysis and all patients recovered.

CONCLUSION

Poisonous snake bite is a common life threatening medical emergency in our region. Morbidity and mortality due to this can be reduced by early administration of anti-snake venom and prompt recognition and management of complications. So, prompt referral of children with poisonous snake bite to

centres where facilities to manage snake bite will be crucial in preventing mortality.

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

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