Original Research Article

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Clinicoepidemiology, clinical profile and outcome of venomous snake bite in children in Konaseema region of Andhra Pradesh, India

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ABSTRACT

Background: Venomous snake bite is an acute medical emergency, and children are more quickly and severely affected than adult. Venomous snake bite is responsible for 28.5 deaths per 1000 snake bite death among 5-15years old children. Most of them used to be from rural India and is more common in school going children. But there is no study regarding clinic epidemiology and treatment outcome among pediatric age group in this part of Andhra Pradesh. This retrospective descriptive has been conducted to evaluate the clinic epidemiology, clinical presentation, complication and treatment outcome in snake bite in pediatric patients in our set up.

Methods: Present study is a retrospective, descriptive study conducted in the department of paediatrics Konaseema institute of medical science Amalapuram Andhra Pradesh, between 2006 to September 2018. This study protocol is approved by the institutional ethics committee. All the clinical parameters like, age, sex, season of bite, time of bite, socio economic statue, region, site, common clinical presentation, complications, reaction to ASV outcome of treatment were obtained from patient's case record and was analysed.

Results: In present study total 166 snake bite patient case records were evaluated, out of this 166 snake bite cases, 28 bites were by unknown snakes. Demographic profile of patient shows that out of 70 cases, 49 cases were in male child and 21 cases were in female child. Regarding clinical profile of the children with snake bite as mentioned in Table 3, local pain was present in (n=70) 100 % patients. Local blending was presenting symptom in 64.28 %(n=45) patients.

Conclusions: From present study authors conclude that snake bite in children is more common among school going children, during monsoon and post monsoon, and in rural area. In our region vasculotoxic snake envanomation is more common and presented with cellulitis which required surgical intervention in most of circumstances. In neurotoxic envenomation some patient developed respiratory paralysis which required ventilatory support.

Keywords: Clinical profile and outcome, Paediatrics, Venomous snake bite

INTRODUCTION

As per the fact sheets of world health organization 20 February 2018 snake bite is a neglected health issue. Under reporting of snake bite incidence and mortality is common.¹ As per the study of Mahapatra B, Warrell DA, Suraweeraw et al, snake bite remains an important cause accidental death in modern India and is

underestimated. The estimated total of 45900 (95% Cl 40900-50900) death in 2005, which is 30 times higher than Govt data.² There are about 60 species of venomous snake found in India. Common cobra (Naja naja) common Krait (Bungarus caerulleus), Saw-scaled viper (Echis carinatus), pit viper, Russel viper and krait are reported to be common venomous snake.3 Venomous snake bite is an acute medical emergency, and children

are more quickly and severely affected than adult. 1 venomous snake bite is responsible for 28.5 deaths per 1000 snake bite death among 5-15 years old children. Most of them used to be from rural India and is more common in school going children.⁴



Figure 1: Russell viper brought by attendant of patients.

Well irrigated paddy fields, dense coconut plantation, plenty of rodents and their holes and termite mounds present in Konaseema region of Andhra Pradesh creates a suitable habitat for snakes.



Figure 2: King cobra and krait preserved in lab collected from local area.

As this part of Andhra Pradesh having rural population, so snake bite incidence is common.



Figure 3: Habitat of snake.

But there is no study regarding clinic epidemiology and treatment outcome among paediatric age group in this part of Andhra Pradesh. This retrospective descriptive has been conducted to evaluate the clinic epidemiology, clinical presentation, complication and treatment outcome in snake bite in paediatric patients in our set up.

METHODS

Present study is a retrospective, descriptive study conducted in the department of pediatrics Konaseema institute of medical science Amalapuram Andhra Pradesh, between 2006 to September 2018. This study protocol is approved by the institutional ethics committee. Permission was obtained from medical superintendent to use the information from medical recorded department. Cases were selected for this study as per inclusion and exclusion criteria.

Inclusion criteria

- Age below 15 years
- Both sex
- Patient with symptoms of snake envenomation
- Treated with ASV.

Exclusion criteria

- Unknown bites
- Fang mark but no symptoms
- Patient discharged against medical advice.

All the clinical parameters like, age, sex, season of bite, time of bite, socio economic statue, region, site, common clinical presentation, complications, reaction to ASV outcome of treatment were obtained from patient's case record and was analysed, In our clinical set, up all the patients with established venomous snake bite or unknown snake bite with typical symptoms of snake envenomation are treated as per WHO protocol. A detailed systemic/local examination were carried out in all patients, all investigation like hemograme, platelet count, peripheral smear, urine examination for blood, protein or myoglobin, 20 min whole blood clotting time and chest X-ray was done. As per the requirement of the patient supporting treatment was given, for reversal of neurological symptoms, atropine was given along with neostigmine, till the reversal, similar blood transfusion, dialysis, ventilator support was given as per requirement. In present study each point was considered to be normalization of neurological, haematological symptoms or death.

Stastical analysis

All statistical analysis was performed by using the spss 19.0 for window platform. Data was summarized mean and percentage was used for interpretation of data.

RESULTS

In present study total 166 snake bite patient case records were evaluated, out of this 166 snake bite cases, 28 bites were by unknown snakes.

Table1: Nature of snake bite.

Variables		Number	Percentage
Unknown	Non- poisonous	18	10.84
	Poisonous	10	0.06
Non-poisonous		78	46.98
Poisonous		60	36.14
Total		166	100

From them 10 were presented with symptoms of envenomation and 18 were having no symptoms. Numbers of established non-poisonous bite cases were 78 and venomous snake bite cases were 60. As per our inclusion and exclusion criteria 70 case records of poisonous snake envenomation were enrolled for this study and analyzed.

Table 2: Demography of the patients (n=70).

Variables		Number of patients	Percentage
Sex	Male	49	70
	Female	21	30
Age	0-4 years	20	28.77
	4-15 years	50	71.429
Month of bite		23	32.85
		35	21.42
		18	45.71
Region	Rural	43	61.44
	Urban	61.44	38.55
Site of	Upper limb	22	31.42
bite	Lower limb	48	68.51
Timing of bite	6am-12pm	10	14.28
	12pm-6pm	18	25.71
	брт-бат	42	60.00

As per Table 2, demographic profile of patient shows that out of 70 cases, 49 cases were in male child and 21 cases were in female child. 20 cases were below 4yrs of age rest were between 4-15years. In our study youngest child was 11-month-old. Number of snake bite cases were 22 in summer, 35 cases were in monsoon, and 18 cases of snake bite were in winter.

In our observation 61.44%) (n=43) patients were from rural background rest were from urban area. Regarding site of bite, 68.5% (n= 48) patients having bite mark in lower limb, and 31.42% (n=22) having bite mark in upper limb. 60% of the patients have bite in the evening after 6 pm, 14.28% (n=10) bite was in morning that is between 6am to 12 pm and, 25.71% of bite was in the afternoon between 12 pm to 6pm.

Table 3: Clinical profile of children with snake bite.

Variables	Number	Percentage
Local pain	70	100
Local bleeding	45	64.28
Edema	68	97.14
Cellulites	28	40
Ptosis	6	8.5
Diplopia	5	7.1
Dyspnoea	10	14.28
Pain abdomen	8	11.42
Haematuria	4	5.17

Regarding clinical profile of the children with snake bite as mentioned in table-3, local pain was present in (n=70) 100 % patients. Local blending was presenting symptom in 64.28 % (n=45) patients. Oedema at biting site was present in 97.14% patients. 40 % (n=28) patient has developed cellulitis. Ptosis was present in 6 (8.5%) patients. 5(7.1%) patients were presented with diplopia. 14.28% (n=10) patients were presented with dyspnoea. Pain abdomen was found in 8(11.42%) patients. Hematuria was present in (5.17%) 4 patients.

Table 4: Complication of snake bite in children.

Variables	Number	Percentage
Neurotoxicity	26	37.14
Vasculotoxicity	40	57.14
Both (Neurovascular)	4	5.71
Cellulites	28	40
Respiratory paralysis (ventilatory support)	14	20
Idiosyncrasy to ASV	1	1.4
Shock	3	4.2
ARF (Acute renal failure)	1	1.4

In present study authors have observed that children with venomous snake bite have developed various complication 31.17% (n=26) patients have developed neurotoxicity.

Vascular toxicity was present in 57.14% (n=40) patients. Four patients (5.17%) presented with both vascular toxicity and neurotoxicity. 40% (n=28) patient developed cellucitis.14 patients (20%) developed respiratory paralysis and required ventilator support.3 patients (4.2%) went into shock.

Table 5: Outcome of treatment.

Variables	Number	Percentage
Recovered	69	98.5
Death	1	1.5
Disability	Nil	0

One patient has developed acute renal failure. Regarding outcome of treatment most of the patient recovered, there was only one death out of 70 snake envenomation. There

was no disability in the patient but because of surgical debridement of cellulitis duration of stay in hospital was more in some children.

DISCUSSION

A total of 70 cases of venomous snake bite was included in our study in 12 years period. In present study authors have found that incidence of bite was more in male then female that is 70% vs 30%, which corroborates with the finding of Kshirsagar et al (60.49% vs 39.50%) and Kumar AH et al (66.11 vs 32.88%).^{4,5}

In our study authors have found that incidence of bite is more in children above 5 years of age, which is supported by the work of Kumaravel KS et al and Mohapatra B et al.^{2,6}

Incidence of snake bite was more in monsoon followed by summer season which is supported by the work of Mohapatra B et al, and Bhalla G et al.^{7,2} Most of the patient were from rural area (61.44%) this finding is supported by the finding of other studies.^{5,6} Lower limbs were the common site of snake bite this finding corroborates with the work of Jayakrishnan M et al and Jasjit Singh et al.^{8,9} Regarding time of the bite, it was higher on the evening between 6pm to 6am. This supported by the work of Rajkumar M et al, Meshram et al and Roshini KK et al.^{10,11}

Regarding clinical profile of the patient local pain was present in all patients, oedema at the site of bite was also very common that is 97%, and bleeding from the site of bite was found in 64.28%. This finding is supported by the work of Virendra C et al, Patil et al and Rajesh K et al. 12,13 Forty % patients presented with cellulites in our study, this finding in not supported by the study of Khirsagar et al.4 But our study is supported by the work of Virendra C. Patil et al.¹² Ptosis was present in 7.3% which is similar to the finding of Rajesh K et al.¹³ Dyspnoea was present in 14.28% present which nearly collaborates with the finding of Virendra C. Patil et al. 12 In present study pain abdomen was found in 11.42% patients of total snake bite patients, this finding was observed by others also Kavitha S et al. found it 10%. but in Rekha Thapar study incidence it was 1.5%. 14,15 This difference may be due to classification of symptoms as per the nature of poisoning but authors have taken symptoms in total bites without separating on the basis of nature of poisoning. Incidence of haematuria was 5.17% which is similar to the work of other investigation. ^{13,14}

In present study authors have observed that in our region there was more vasculotoxic envenomation then neurotoxic, which indicates the prevalence of viper bites then cobra bite. This finding is supported by the work of various other in south India, Kavita S et al, Rekha Thaper et al, and JC Menon et al. 14-16 Among the clinical presentation of vasculotoxic cellulitis was the most common complication, was the reason for surgical

intervention and increased duration of hospital stay, which is again supported by the work of KG Sajeeth Kumar et al.¹⁷ Respiratory paralysis which required ventilatory support was complication authors observed in neurotoxic complication, which corroborates with the finding at other studies.^{13,16} Among all the patient treated with ASV(anti snake venom) only one patient developed reaction to anti snake venom, which corroborates with the finding of Khirsajar et al.⁴ Acute renal failure was also found in 1.4% of the patient, which corroborates with the finding of Patil B et al.¹⁸

Most of the patient treated with ASV and under ICU (intensive care unit) were recovered the percentage of death was 1.5% this is similar to the finding of khirsagar et al, that is 1.81%, as per data of Meshram RM et al, it was 11.25%. 4.10

CONCLUSION

From present study authors conclude that snake bite in children is more common among school going children, during monsoon and post monsoon, and in rural area. In our region vasculotoxic snake envanomation is more common and presented with cellulitis which required surgical intervention in most of circumstances. In neurotoxic envenomation some patient developed respiratory paralysis which required ventilatory support.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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