

Clinical Profile of Envenomation in Children With Reference To Snake Bite

Dr.Ajay Mohan Varahala¹, Dr.Chandraiah Dundigalla²,
Dr.G.V.S.Subrahmanyam³, Dr.Purushotham Raju Amrutha⁴

^{1,2}Assistant Professor of Paediatrics, Niloufer Hospital, Hyderabad, India

³ Professor of Paediatrics, Niloufer Hospital, Hyderabad, India

⁴ Postgraduate in Paediatrics in Niloufer Hospital, Hyderabad, India

Corresponding Author: Dr.V.Ajay Mohan, H.NO 16-3-989/c, Near Police Hospital, Malakpet , Hyderabad 500024, Telangana, India.

Abstract:

Background: Snake bite is a preventable life-threatening medical accident, the dangers of which are amplified in children possibly because of a higher ratio of injected venom to body mass. Timely intervention and management can prevent the mortality due to snake bites which is grossly under reported.

Objective: This study aims at identifying the demographics, clinical manifestations, management and response to treatment in the victims of snake bite over a period of one year.

Methodology: It is a prospective observational study conducted on all the paediatric cases admitted to Niloufer Hospital, with the history of snake bite. The clinical details, investigations and treatment plan based on the envenomation for all the patients are studied thoroughly.

Results: A total of 43 children were a part of this study of which majority (65.11%) was from rural areas. 24 children (55.81%) was bitten by poisonous snakes. Commonest presenting symptom was pain followed by local oedema. Out of the 24 poisonous snake bite cases, 4 deaths occurred.

Conclusion: Snake bite in children is still a significant environmental health hazard especially in rural areas. On the average it causes a loss of 10-11 productive days of work or school to the victim and the family. The mortality and morbidity due to snake bite can be minimized by timely intervention and management with ASV. Therefore the government should ensure that the Anti snake venom (ASV) is available at all times from the Primary health care level.

Key Words: Anti snake venom, envenomation, environmental hazard, local oedema, pain, snake bite,

I. Introduction

Snake bite is a preventable health hazard .Children are at risk of sustaining snakebite mainly because of their curiosity about the unknown creatures, innocent act of invading the reptile's space and habit of barefoot walking particularly in the darkness. Venomous snakebite is an important public health issue in tropical and subtropical countries^{1,2}. Recently the government of India's Central Bureau of Health intelligence reported only 985 snake bite deaths in 2010. Its incidence is usually underestimated because of lack of epidemiological data. In India the number of snake bite fatalities has long been controversial. Estimates as low as 61,507 bites and 1,124 deaths in 2006, 76,948 bites and 1,359 deaths in 2007 to as high as 50,000 deaths each year have been published. According to Health status indicators in 2012, total snake bites in Andhra Pradesh are 26,862 and among these 134 have died³.

II. Objective

The present study aims at recording the various clinical manifestations, complications and outcomes in children who are victims of snake bite.

III. Methodology

1. SOURCE OF DATA:-43 children admitted with history of snake bite during the period January 2013 to December 2013 were studied.
2. STUDY TYPE:-Prospective observation study conducted at Niloufer hospital which is a tertiary care centre and also an allied institute of Osmania Medical college, Hyderabad.
3. INCLUSION CRITERIA:-a) All children (if able to tell) with history of snake bite.
b) Children (if unable to tell)
i) History given by witnesses (who has seen the bite)

ii) Clinical features suggestive of snake bite with presence of snake at the premises of affected children.

4. **Exclusion Criteria:** - i) Children with history of suspected snake bite where in:

- a) Patients or attendants have not seen the snake.
- b) No fang marks
- c) No features of envenomation

ii) Children with pre-existing congenital heart diseases and chronic diseases or other chronic illness.

5. **Method Of Collection Of Data:** - All children with snake bite were subjected to thorough clinical examination to assess various systemic manifestations. Treatment was given to the affected children based on severity of envenomation. Patients were divided into mild, moderate, severe envenomation depending on clinical manifestations. Blood samples were collected for investigations. Bed side tests for bleeding and clotting time was performed. Complete Blood Counts, blood urea, serum Creatinine, urine routine were obtained in all cases. Prothrombin time, Liver Function Tests, Electro Cardio Gram were obtained when indicated. All the patients in whom it was decided to give ASV were premedicated with chlorpheniramine maleate. Intracutaneous testing was carried out. All patients who showed any reaction were given further dose of chlorpheniramine, hydrocortisone and started on ASV infusion. Initial dosage was 2-5 vials for mild, 5-9 vials for moderate and 10-15 vials for severe envenomation for first 8-10 hours. Further dosage was based on clinical judgement. Neostigmine was administered to all patients with neuromy paralysis till reversal of neurotoxic manifestations. Blood transfusion, respiratory assistance and dialysis were carried out where ever indicated. All the cases were administered injection tetanus toxoid, and appropriate antibiotics and anti-inflammatory drugs were also given. Patients developing severe cellulitis were referred to surgeons for necessary treatment like multiple incisions and skin grafting.

IV. Results

During the study period from January 2013 to December 2013, A total of 47 children were admitted to Niloufer Hospital with the history of snake bite. Out of this, only 43 were included in the study as 4 cases did not fulfil the inclusion criteria.

Following are the observation in those 43 children.

Incidence of Envenomation Cases in Niloufer Hospital

Table-1

Snake bite	43
Total admissions	52,875

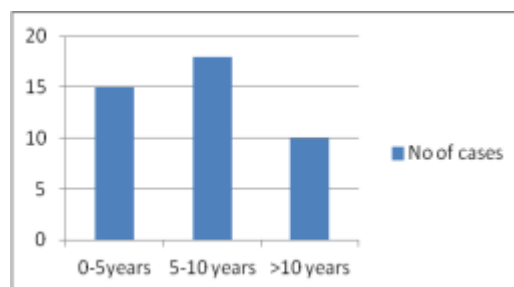
The hospital incidence of snake bite - 81 per 1,00,000 admissions per year.

Age Wise Distribution

Table-2

Age	Snake bite	Percentage
0-5 years	15	34.88%
5-10 years	18	41.86%
>10 years	10	23.25%

Chart-1



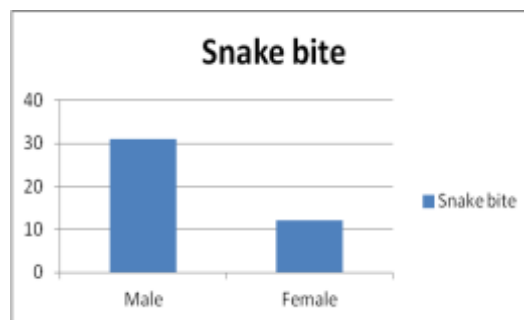
Sex Wise Distribution

Table-3

Sex	Snake bite	Percentage
Male	31	72.1%
Female	12	27.9%

Envenomation cases were more common in males. Male

Chart-2

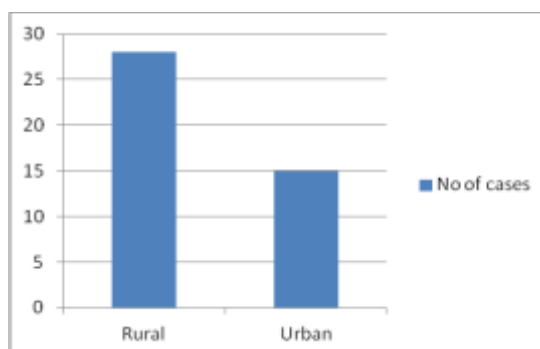


Rural And Urban Distribution

Table-4

Place	Snake bite	Percentage
Rural	28	65.11%
Urban	15	34.88%

Chart-3



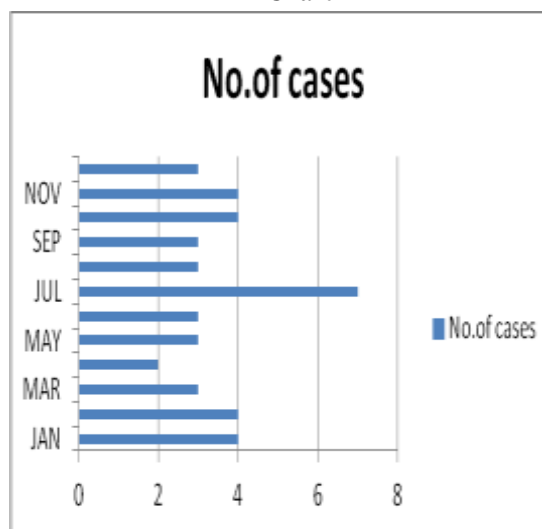
Envenomation cases are mainly from rural areas. About 65.11% of envenomation cases from rural places, while the rest 34.88% were from urban places

Distribution Around The Year

Table- 5

Month	Snake bite	Percentage
January	4	9.3
February	4	9.3
March	3	6.97
April	2	4.65
May	3	6.97
June	3	6.97
July	7	16.27
August	3	6.97
September	3	6.97
October	4	9.3
November	4	9.3
December	3	6.97

Chart-4



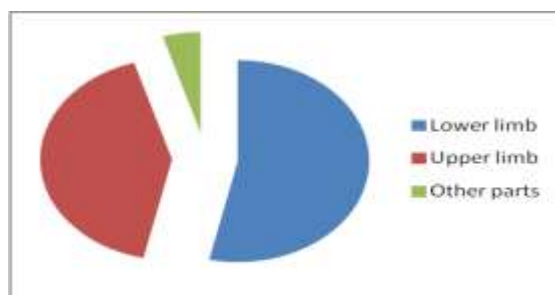
Envenomation cases were distributed all around the year. Maximum numbers of snake bite cases were noted in July, which coincides with rainy season.

Site of The Bite

Table-6

Site of bite	Snake bite	Percentage
Lower limb	23	53.5%
Upper limb	18	41.9%
Other parts	2	4.65%

Chart-5



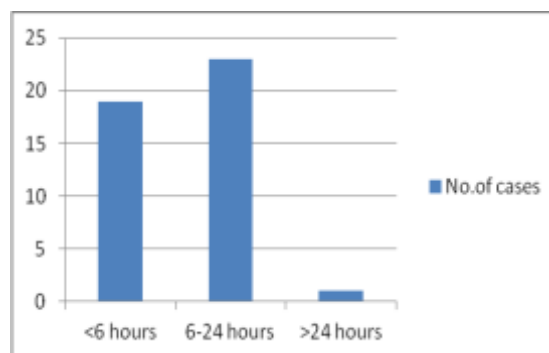
Limbs were the commonest site for bite. Lower limbs were commoner (about 23 cases out of 43 snake bites). 2 children had unusual sites of snake bites, one on left ear and another one on abdomen, these occurred while children were asleep.

Time Since Snake Bite To Arrival To Hospital

Table-7

Time since bite	Snake bite	Percentage
<6 hours	19	44.18%
6-24 hours	23	53.48%
>24 hours	1	2.33%

Chart-6



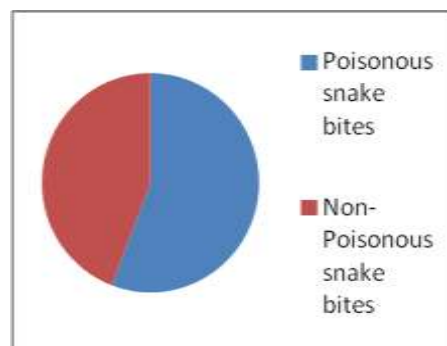
Out of 43 envenomation cases, most of the children were brought within 24 hours. Only 1 child was brought after 24 hours of bite.

Effects Of Envenomation

Table-8

Type of Snake bite	Number of cases	Percentage
Poisonous Snake bites	24	55.81%
Non-Poisonous Snake bites	19	44.19%
Total	43	100%

Chart-7



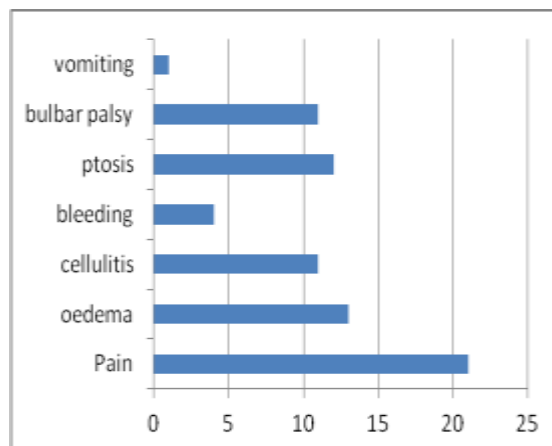
Out of 43 Snake bites, 24 were poisonous Snake bites, requiring Anti snake venom (55.81%). These cases were referred from Primary health centres, community health centres and some private Hospitals.

Clinical Features

Table-9

Clinical feature	Number of cases	Percentage
Local pain	21	48.84%
Local edema	13	30.23%
Cellulitis	11	25.58%
Bleeding from bite	4	9.30%
Ptosis	12	27.90%
Bulbar palsy	11	25.58%
Vomiting	1	2.32%

Chart-8



Pain was the commonest symptom seen in 48.84% of snake bites. It was found in both poisonous and non-poisonous bites, though more common and persistent in venomous bites. Pain had its onset between 2 min to 2 hours, and varied in intensity from mild to severe. It was rapidly relieved in the non-poisonous snake bites with simple analgesics.

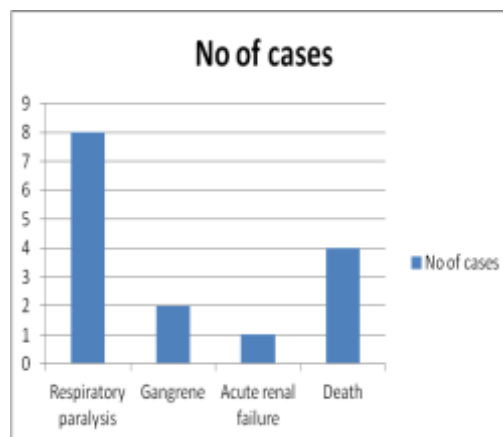
Local oedema is seen in 30.23% of snake bites. Ptosis was the earliest feature seen with neurotoxic snake bite. 27.90% of snake bites children developed ptosis, which was followed by bulbar palsy seen in about 25.58% children. Most cases showed the sequential progression from Ptosis to respiratory inadequacy.

Complications

Table-10

Complication	Number of cases	Percentage
Respiratory Paralysis	8	18.60%
Gangrene	2	4.65%
Acute Renal failure	1	2.32%
Death	4	9.30%

Chart-9



Most common complication of snake bite was Respiratory paralysis which was seen in 18.60% of snake bite cases. Out of 24 poisonous snake bites, only 2 cases developed gangrene. One child had lost his right middle finger and another child lost her right little finger. Only one child developed renal failure, which was referred to nephrologists for dialysis. This child was discharged after 22 days of Hospital admission. Out of 24 poisonous snake bites, 4 children died. Out of these 4 deaths, 2 cases died within 24 hours of hospital admission, 1 case died after 2 days and another one 12 days after hospital admission.

Table-11 Number Of Snake Bite Cases Received Antsnake Venom (Asv)

ASV vials	Number of snake bite cases	Percentage (of poisonous snake bites)
5 vials	6	25%
10 vials	5	20.83%
15 vials	3	12.50%
>15 vials	10	41.67%

Out of 43 snake bites, 10 snake bite cases required more than 15 vials of ASV during treatment.
 6 Snake bite cases received 5 vials of ASV.
 5 Snake bite cases received 10 vials of ASV.
 3 Snake bite cases received 15 vials of ASV

Duration Of Hospital Stay:-Most of the poisonous bites treated were discharged within 10 days, but those who developed local complication stayed longer till the wound healed. One child, who developed renal failure stayed in hospital for 22 days for treatment. Mean duration of hospital stay of non-poisonous snake bite was 3.26 days. Mean duration of hospital stay of poisonous snake bite was 11.04 days.

Table-12

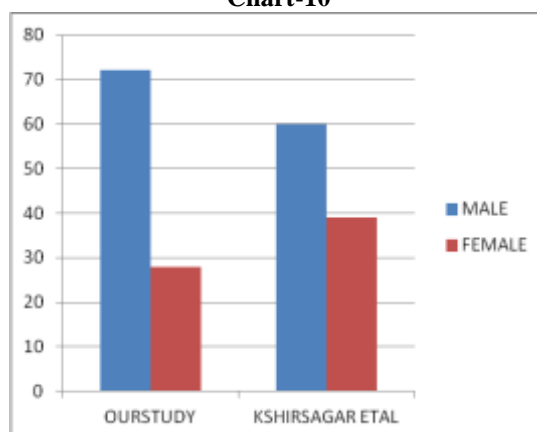
Insult	Range (in days)	Mean (in days)
Non Poisonous Snake bite	2-5	3.26
Poisonous Snake bite	2-22	11.04

V. Discussion

Present study had a total of 43 children with snake bites who were registered during the one year study. Incidence of snake bite in Niloufer Hospital was 81 per 1,00,000 per year.

The study observed that male children and children who are above 5 years of age were more prone to this environmental health hazard which can be attributed to their behaviour and nature of playing more outdoor games. This is in comparable to the study conducted by Kshirsagar VY, et al⁴. However Saborio et al study showed no gender difference.⁵

Chart-10



In the present study, out of 43 snake bites, 28 cases (65.1%) are from Rural areas. Out of 43 snake bites, 19 cases reached Niloufer Hospital within 6 hours of snake bite. On enquiry, it is learnt that majority of patients who presented after 6 hours of bite were from Rural areas. The reasons for delay in them being:

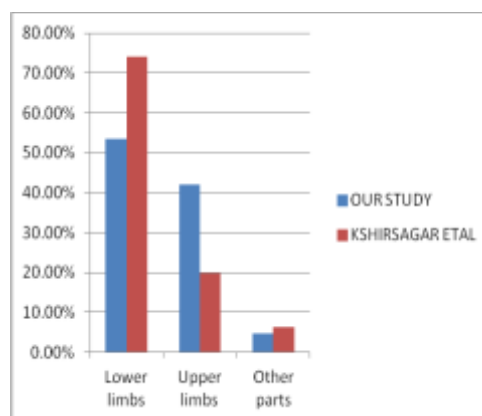
1. Approaching a locally available quack, or faith healer or a medical facility and reaching our tertiary care only when there was no improvement in the condition or when the condition has worsened.
 2. Lack of adequate transportation facilities.
- Similar reasons were noted in other studies.⁶

In our study 95.4% of cases were bitten on extremities, only 4.6% got it on other parts of the body. Out of 43 snake bites, 23 bites were on lower limb which is 53.5% of the total bites. Other studies also showed similar experiences where fang marks are more commonly seen in lower limbs^{7, 8, 9, 10}.

Table-13

Site of snake bite	Our study	Kshirsagar VY, et al
Lower limbs	53.5%	74.04%
Upper limbs	41.9%	19.75%
Other parts	4.6%	6.17%

Chart-11



In our study, 30.23% of snake bites were reported during the period July-September which is less compared to Kshirsagar VY, et al study^{1, 4,5,11}. The incidence varies in different regions of India due to various factors. Main factors among them being the rainfall and pattern of agricultural activity.

The type of snake depends on the geographical distribution. Clinical manifestations of snake bite depend up on the type of snake bite. Majority of the children following snake bite envenomation developed local or systemic complications. Ptosis was common feature in neurotoxic envenomation in our study. In our study 4 children (16.7% of poisonous snake bite cases) died. One of the reasons for the high mortality could be due to the late arrival to the hospital.

VI. Conclusions

This is a prospective observational study conducted on 43 children of envenomation with reference to snake bite. Envenomation causes significant loss of productive working days for the family in general and also for the victims in particular. The study highlights the importance of early intervention and timely management which can bring down the mortality and morbidity in the snakebite envenomation cases. Hence the government and authorities of the health system should ensure the availability of Anti-snake venom which is a life saving measure even at the Primary Health Care level. The study concludes that awareness among the people regarding the early initiation of treatment is necessary to reduce the fatality rates because of this health hazard.

References

- [1] Warrell DA, The clinical management of snake bite in southeast Asian region, southeast Asian J. Tropical Med Public Health 1999; 30;1:84
- [2] Guitierrez JM, Theakston RDG and Warrel DA, Confronting the neglected problem of snakebite envenoming: The need for a global partnership. PLOS Medicine 2006; 3:727- 31
- [3] State/UT wise Cases and Deaths Due to Snake Bite in India. Government of India, Central Bureau of Health Intelligence. Health Status Indicators, National Health Profile 2007, 2008 and 2012(Provisional). Pp: 107-108. Available at: <http://cbhidghs.nic.in/writereaddata/mainlinkFile/File1133.pdf>. Access date: sep2014.
- [4] Vinayak Y.Kshirsagar,MD; Clinical profile of Snake Bite in Children in Rural India; Iranian Journal of Pediatrics, Volume 23 (Number 6), Dec-2013; Page 632-636
- [5] Saborio P, Gonzalez M, Cambronero M, Snakebite accidents in children in Costa Rica: epidemiology and determination of risk factors in the development of abscess and necrosis [Spanish] Toxicon. 1998; 36(2):359-66.
- [6] Bawaskar HS, Bawaskar PH. Envenoming by the common krait (*Bungarus caeruleus*) and Asian cobra (*Naja naja*): Clinical manifestations and their management in a rural setting. Wilderness Environ Med. 2004;15(4):257-66.
- [7] Punde DP. Management of snake-bite in rural Maharashtra: A 10-year experience. Natl Med J India. 2005;18(2):71-5
- [8] Jamieson R, Pearn J. An epidemiological and clinical study of snake-bites in childhood, Med J Aust. 1989, June19; 150(12):698-702.
- [9] Shrestha BM. Outcomes of snakebite envenomation in children. J Nepal Paediatr Soc.2011;31(3):192-7.
- [10] Currie BJ, Sutherland SK, Hudson BJ, Smith AM. An epidemiological study of snakebite envenomation in Papua New Guinea. Med J Aust. 1991, Feb18; 154(4):266-8.