

**Original research article**

## **A study of clinical profile of snake bite poisoning**

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### **Abstract:**

Since ages Snakes were the object of interest and worship due to their fascinating appearance coupled with their power over death. They are of interest to biologists and toxicologists all over the world to save people from snake bites and death. In a tropical country like India, snake bite can often be fatal leading to sudden death on an unwary family due to fear, mysticism and also by the toxin itself. So this study was taken up to document the incidence, prevalence, morbidity, mortality of snake bite cases at Govt.General Hospital, Kurnool Medical College, Kurnool. We have enrolled 51 cases of snake bite cases admitted in Department of Medicine, Kurnool medical college, KURNOOL between October 2008 to September 2009 and conclude that Most of the snake bites were noted in males in the age group of 30 to 40 years working as Agricultural workers and manual labourers and were more common during the rainy season in the months of June, July, August and September. Neurotoxicity was seen in 52.94% of cases, Coagulopathy was seen in 5.88% of cases bites, Renal Failure was seen in 1.96% of cases and with mortality of 7.84%.

**Keywords:** snakebite, incidence, prevalence, morbidity, mortality, envenomation, neurotoxicity, coagulopathy

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### **INTRODUCTION**

Snakes have been the object of reverence and worship of the Dravidian races of India since time immemorial. Their fascinating appearance coupled with their power over death, it was only natural that they generated fear and veneration; they also became the object of interest of biologists and toxicologists all over the world.

In a tropical country like India, the climate and the rural setting super imposed on low socio economic circumstances dictate an environment where snake bite can be, and has often been, fatal. The tragedy of sudden death on an unwary family; death of members in their prime; and most importantly potentially preventable deaths, as much caused by fear and mysticism, as by the toxin itself –all reflect the unpleasant fact that the treatment of snake bite hasn't received much attention for which it is

deserved. Currently, an intense work is being done on the pharmacological, pathophysiological, toxicological and immunological aspects of snake venoms to give a better break to the snake bite victim<sup>[1,2]</sup>.

To document the incidence of snake bite cases at Govt.General Hospital, Kurnool Medical College, Kurnool and to study the prevalence, morbidity and mortality, this study was taken up.

### **MATERIALS AND METHODS**

Only those cases with a definite proof of snake bite obtained either subjectively or objectively were taken up. A detailed study of 51 cases made and 12 cases are recorded as per the proforma for the dissertation. Routine investigations like complete urine exam, microscopy, albumin, sugar, bile salts and pigments, total and different counts, platelet counts, E.C.G, plain X-Ray abd, B.T,CT, urea

,sugar and serum electrolytes have been carried out in all cases.

Special investigations like prothrombin time, liver function tests, ultrasound, serum amylase and stool for occult blood were carried out when relevant. All the cases with a definite h/o snake bite were closely observed for 12 hrs and then examined every day with particular reference to:

1. Local references
2. Bleeding manifestations
3. Neurological manifestations till asymptomatic .
4. Polyvalent ASV was given as IV in a fixed dose with Purified Tetanus Toxoid. Neostigmine and atropine were given for neurological manifestations as per fixed schedule till asymptomatic for 24 hrs. The corticosteroids were given for systemic manifestations and for anaphylactic reaction. Antibiotics were given to all cases.

The I.V.fluids, Blood transfusion, artificial ventilation with a volume ventilator, were given when required. Specific treatment of Acute Renal Failure, Hyperkalemia, local cellulitis and Gangrene were as modes of treatment.

Data entry and analysis was done using Microsoft Excel 2007 version. Data was summarized in percentages and proportions.

## RESULTS

The no of cases enrolled in the study are 51 cases of poisonous snake bites during the period from October 2008 to September 2009.

The incidence of snake bite among the age 20 to 40 yrs was highest with 34 cases (66.7%). Among them 30-40yrs age group (37.2%) was prone for more bites. In the study 38 (74.5%) were males and 13 (25.5%) for females.

With regards to diurnal incidence, most snake bites (72.5%) were during night time. The most common site of snake bite was lower limb (n=26, 50.9%) followed by upper limb (n=18, 35.3%), other location were trunk, head & neck and in 3 cases site of bite was not known.

Clinical features in this study of 51cases: 40 cases (78.4%) had local features and 27 (52.9%) systemic features.

Monthly wise distribution of the admitted cases snake bite showed that majority were from July (21.7%) and June (17.6%) months followed by September and August.

Site of bite Vs Mortality: Bites on trunk, head and neck had more percentage of mortalities than bites on limbs.

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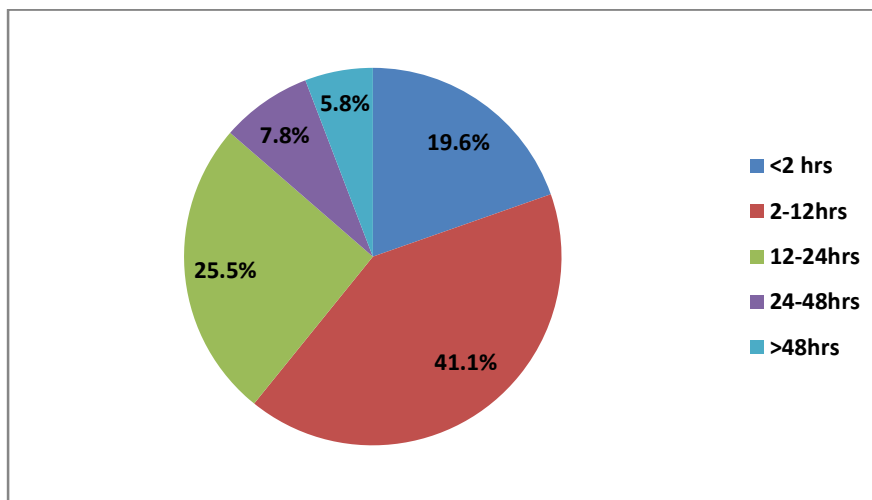
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**Table 01 :** No. of snake bite cases admitted in Hospital monthly wise

Months	Number (Percentages)
October 2008	05 (9.8%)
November 2008	02(3.9%)
December 2008	02 (3.9%)
January 2009	02 (3.9%)
February 2009	01 (1.9%)
March 2009	02 (3.9%)
April 2009	02 (3.9%)
May 2009	02 (3.9%)
June 2009	09 (17.6%)
July 2009	11 (21.7%)
August 2009	06 (11.8%)
September 2009	07 (13.8%)

**Graph 01:** Interval between bite and arrival of cases at Gen. Hospital, Kurnool.



The interval between bite and arrival of cases was 2-12 hours in 41.1% cases, followed by 12-24 hours (25.5%). About 5.8% cases had arrived after 48 hours.

The first aid measures are a crucial part of the management of snake bite cases and the present study found that faith healers and ritualistic methods played most of the role before admission (90.2%) into hospital causing more mortalities.

**Table 2:** Local features in the study of 51 cases

Local features	No.of cases	Percentage
Fang marks	43	84.3%
Tingling	40	78.4%
Pain	35	68.6%
Swelling	27	52.9%
Local gangrene	5	9.8%
Bleeding	6	11.7%
Cellulitis	23	45.1%

Pain, tingling, swelling and cellulitis were the commonest presenting features here.

With regards to pre paralytic symptoms, the most common symptom was vomiting (17.6%) followed by drowsiness (15.6%) and others.

**Table 3:** Neurological features

Neurological features	No.of cases	Percentage
Ptosis	26	50.9%
Ophthalmoplegia	24	47.1%
Bulbar Palsy	20	39.2%
Respiratory Paralysis	9	17.6%
Trismus	3	5.8%
Facial palsy	1	1.9%
Proximal limb paralysis	9	17.6%

The most common neurological feature was ptosis (50.9%) followed by Ophthalmoplegia (47.1%), Bulbar Palsy (39.2%), Respiratory Paralysis (17.6%), Proximal limb paralysis (17.6%) and others.

Central cyanosis and pulmonary edema were most common respiratory features (11.7%).

Hematological features showed that bleeding from injection site in 5.8%, hematuria (5.8%), GI hemorrhage (5.8%) and others.

## DISCUSSION

Snake bite is one of the greatest public health problems in the tropics like Indian sub-continent. It is an occupational hazard of farmers and hunters mostly. While the world's mortality rate is 30 to

40,000 per annum, mortality in India is around 15,000 per annum. The undisputed fact is that most of the cases are unreported.

Among the 11,544 cases admitted in medical wards, 278 snake bite cases were admitted in a span of one year from October 2008 to September 2009 in the Govt.Gen.Hospital, KURNOOL. These were mostly in and around Kurnool Dist. Among them, 51 cases with definite h/o snake bite were chosen for the study of clinical profile of snake bite poisoning.

In the study of 51cases, definite features of systemic envenomation were noticed in 60.78% of cases. This is a higher figure than 34% from J M

Pappachan et al study<sup>[3]</sup>, but M L Kularatne study<sup>[4]</sup> showed 69.82%.

In the present study, it showed neurotoxic manifestations in 52.94% cases and haematological manifestations in 7.84%. In contrast, N Sharma et al study<sup>[5]</sup> neurotoxicity in 60.56% cases and haematological abnormalities in 36.6 % cases was observed.

#### Mortality:

In the present study, mortality is observed in 7.84% of cases. In comparison, mortality was observed in Hati AK et al study<sup>[6]</sup> with 10.09%, with 5% and JM Pappachan et al study<sup>[3]</sup> with 3%. Seasonal incidence:

The present study, the maximum incidence was noticed during the rainy months when water logging of pits forces snakes to come out and seek shelter elsewhere. In the present study, the data revealed that 17.6%, 21.7%, 11.8% and 13.8% cases admitted in June, July, August and September 2009 respectively. Hati AK study<sup>[6]</sup> noticed the months of July and August as most bites occurred. As per SAM Kularatne study<sup>[4]</sup> 49% were during the months of September to December.

#### Age incidence :

In the present study of victims ranged from 1<sup>st</sup> to 8<sup>th</sup> decade, the maximal involvement was between 30 to 40 yrs age group with 37.25%. In comparative study, most victims are in 10 to 30 yrs age group with 52% in SAM Kularatne study<sup>[4]</sup> and similarly in JM Pappachan et al study<sup>[3]</sup> also.

#### Sex incidence:

Snakes do not discriminate between sexes, but male sex suffers more due to their outdoor activities. In the present study, 74.5% cases by males were involved, whereas 54.72% in Hati AK et al study<sup>[6]</sup>, 58% in JM Pappachan et al study<sup>[3]</sup> and 82% in Sharma N et al study<sup>[5]</sup>, the males were involved.

#### Site of bite:

In the present study, the maximum bites were noticed on lower limbs with 64.7% and among lower limbs 43.13% were with feet involvement. In upper limbs, fingers & hands are mostly suffered in 77.77% of cases. In comparison, Hati A K et al study<sup>[6]</sup> observed 53% cases in lower limbs.

#### Systemic envenomation:

In present study, systemic envenomation occurred in 60.78% of cases and 52.94% of cases were suffered with neurotoxicity. In contrast study, systemic envenomation was in 34% cases in JM Pappachan et al study<sup>[3]</sup>

#### First aid measures:

In the present study, faith healers were given more importance in most cases (90.14%). So hospital admissions were happened after the development of complications because of delayed admissions. In present study, tourniquet was applied in 3.92% cases; immobilization in 7.84% cases; suction in (5.88%). As per Hati AK et al study<sup>[6]</sup>, 22.14% cases got hospital treatment and 65.41% cases went to traditional healers.

#### Time interval between snake bite and admission

In present study, it revealed that only 19.6% cases were admitted within 2 hrs after the snake bite and 41.17% cases in 2 to 12 hrs and 25.5% in 12 to 24 hrs in the hospital. In contrast study, the median interval as 9 hrs was observed in N Sharma et al study<sup>[5]</sup>

#### Clinical manifestations:

##### **Local manifestations:**

In present study, tingling in 78.41%, pain in 68.4% and swelling in 52.9% cases were noticed.

In study by Meenakshi B <sup>[8]</sup>, the presenting complaint in 94 (62.7%) of these patients was local pain associated with local cellulitis. Bleeding manifestations were seen in 35 (23.3%) patients namely - bleeding at the site of bite in 31 patients, hematemesis in 4 patients.

### **NEUROLOGICAL-MANIFESTATIONS:**

Neurological manifestations were seen in 52.94% of cases in the present study.

#### **Pre paralytic symptoms in neurotoxicity:**

In view of pre-paralytic symptoms, vomiting in 17.64% and drowsiness in 15.68% cases.

In SAM Kularatne study<sup>[4]</sup> drowsiness in 43% cases, semi consciousness in 11% cases and deep coma in 17% cases were observed.

#### **Paralytic manifestations:**

In present study of cases, neurotoxicity and ptosis in 50.98% and ophthalmoplegia in 47.05% cases, bulbar involvement in 39.21% cases, respiratory paralysis in 17.64% cases & Trismus in 5.88% cases were developed.

In Seneviratne U et al study, ptosis in 85.7%, ophthalmoplegia in 75% cases, limb paralysis in 26.8%, palatal palsy in 10.7% and neck muscle weakness in 7.1% cases were noticed. In the Seneviratne study<sup>[7]</sup>, neurological symptoms were seen within 6 hrs after the bite, whereas they were within 1 to 2 hrs in present study except one case which was after 6hrs.

In study by Bhalla G<sup>[9]</sup>, 100% patients developed ptosis among 21 cases of Neuroparalytic bite. Ophthalmoplegia was seen in 18 (85.71%) patients of Neuroparalytic bite. Six (28.57%) patients became unconscious, 6 (28.57%) patients with flaccid limb paralysis, 19 (90.47%) patients developed respiratory paralysis, among which 15 patients needed respirator.

In present study, intercostals muscle paralysis affected in 33.33% cases and caused pulmonary edema and central cyanosis with respiratory failure in 22.22% cases.

**CARDIAC MANIFESTATIONS:** In present study, 9.8% cases developed hypotension.

ECG with ectopics and T wave abnormalities were seen in 5.88% cases & they were disappeared after ASV therapy.

In present study, hypokalemia was seen in 1.96% cases whereas SAM Kularatne study<sup>[4]</sup>, 71% cases were with significant hypokalemia (>3.5meq/l) with U wave in ECG and 50% cases of metabolic acidosis.

Study by Kumar MR<sup>[10]</sup> found that two patients had oxygen saturation less than 90% at the time of admission. Arterial blood gas analysis showed acidosis in 5 cases (5.7%), alkalosis in 2 cases (2.3%), and it was normal in 80 cases (92%). Six patients had evidence of acute kidney injury at the time of discharge, and all received dialysis.

### **RESPIRATORY MANIFESTATIONS:**

In the present study, pneumonitis and pleural effusions are low with 3.9% & 1.96% respectively. Respiratory paralysis in 17.64% cases, central cyanosis and pulmonary edema were in 11.76% cases each.

In SAM Kularatne study<sup>[4]</sup>, half number of the patients(50%) were suffered with respiratory paralysis. U Seneviratne et al study<sup>[7]</sup> revealed respiratory failure in 17.9% cases.

### **HAEMOTOLOGICAL FEATURES:**

In the present study of 51 cases, the haematological features such as bleeding from the site, haemetemesis & melena & jaundice in 5.88% of cases and gum bleeding with ecchymosis in 3.92% cases.

In study by Bhalla G, ecchymosis was seen in 4.75%, hematemeses in 4.75%.

### **RENAL SYSTEM:**

In the present study, renal failure was evident in 1.96% of cases and frank microscopic haematuria in 5.88% of cases. In N. Sharma study<sup>[5]</sup>, acute renal failure occurred in 51.9% cases of viper bites. In JM Pappachan et al study<sup>[3]</sup>, they developed late complications in 39.5% cases and A R F in 25.5% cases.

### SUMMARY AND CONCLUSION

Most of the snake bites were noted in males with highest incidence being noticed in the age group of 30 to 40 years. The bites were more common during the rainy season in the months of June, July, August and September and were mostly during the night times. Lower extremities were affected in most of the snakebite cases. The admissions of cases in hospitals within 2 to 12 hours after the bite

were higher. 60.78% cases had systemic features of envenomation and neurotoxic manifestations were most common. Neurotoxicity was seen in 52.94% of cases. Ptosis was the commonest and earliest symptom followed by ophthalmoplegia, bulbar palsy, proximal limb paralysis and respiratory paralysis. Coagulopathy was seen in 5.88% of cases bites, Renal Failure in 1.96%, acute pancreatitis in 1.96% of cases bites.

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