



## A STUDY ON CLINICAL PROFILE OF SNAKE BITE IN TERTIARY CARE HOSPITAL

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**ABSTRACT** **Aim and objective :** To study the prevalence of poisonous and non-poisonous snake bites in Anantapur with reference to age, sex, occupation, part of body bitten, time of bite and the types of poisonous snakes common in this locality and their clinical manifestations **Methods :** This is a descriptive study conducted between October 2021 to October 2022 at a tertiary health care centre in Andhra Pradesh. Snake bites who were admitted and treated during this period were included in this study. The prevalence of poisonous and non-poisonous snake bites in Anantapur with reference to age, sex, occupation, part of body bitten, time of bite and seasonal variation, and the types of poisonous snakes common in this locality and their clinical manifestations were studied. **Results :** A total of 100 patients were studied. Out of 100, 72 patients were of poisonous snakebite and 28 patients were of non-poisonous snake bite. Out of these 72 poisonous snake bites, 38 were viperine snake bites, 22 were neuroparalytic snake bites and 12 were locally toxic snake bites. Among various manifestations snake bite with ischemic stroke is very rare which is observed in 3 cases during this period. **Conclusion :** Snake bite is still a dreadful condition. Delay in hospitalization is associated with poor prognosis and increased mortality rate due to consumptive coagulopathy, renal failure, and respiratory failure. Unusual complications like Disseminated intravascular coagulation (DIC) and ischemic stroke and myocardial infarction were observed in present study.

**KEYWORDS :** snake bite, viperine bite, ischemic stroke

### INTRODUCTION

Snake bite is one of the commonest cause of death in India. Since many Indian households depend on agriculture, snake bite is a significant occupational and rural hazard. The most frequent deadly snakes in Andhra Pradesh are the cobra, Krait, Saw Scaled Viper, and Russell's Viper.

The prevalence of both poisonous and non-poisonous snake bites in Anantapur was investigated in the current study, taking into account factors such as age, sex, occupation, the part of the body that was bitten, the time of the bite, and seasonal variations, as well as the types of poisonous snakes that are common in this area and their clinical manifestations.

Only a small number of ischemic stroke cases resulting from snake bites have been documented, pointing to possible mechanisms such as toxic vasculitis, hypotension, and hypercoagulability condition that cause endothelial damage and thrombosis. In this study, we discovered three instances of a rare consequence caused by Russell's viper bite: cerebral infarction.

### AIM AND OBJECTIVE

To study the prevalence of poisonous and non-poisonous snake bites in Anantapur with reference to age, sex, occupation, part of body bitten, time of bite and the types of poisonous snakes common in this locality and their clinical manifestations

### MATERIALS AND METHODS

The current descriptive observational study was conducted between October 2021 and October 2022 in the medical wards of the Government General Hospital in Anantapur, Andhra Pradesh, India. During the study period, 100 snake bite cases in all were admitted to medical wards. After obtaining consent, individuals who were hospitalised during the study period were interviewed for information using a pre-designed, pre-tested, and structured questionnaire.

A thorough record of demographic and epidemiological factors, including age, sex, place of residence, occupation, location of bite and kind of snake (if known), etc., was acquired. Time required to travel to a medical facility following a snake bite and receive the necessary first

aid was enquired. In each case, a comprehensive clinical examination was performed. The treating physician's opinion was sought in order to determine the type of snake bite (Vasculotoxic, VT, Neuroparalytic, and Non-poisonous). From the patient's case file, further data was gathered on the day of discharge or death.

### RESULTS

In our hospital, a total of 100 victims were examined. Out of 100, 72 patients were of poisonous snake bite and 28 patients were of non-poisonous snake bite. Out of these 72 poisonous snake bites, 12 were locally toxic (LT), 22 were neuroparalytic or neurotoxic (NT), and 38 were viperine or vasculotoxic (VT) snake bites (Tables).

**TABLE 1: AGE WISE PREVALENCE OF POISONOUS SNAKE BITES**

AGE GROUP	NO. OF POISONOUS BITES	TOTAL NO OF SNAKE BITES
14-30	40 (55.55%)	56
31-50	26 (36.11%)	36
>50	6 (8.33%)	8

**TABLE 2: OCCUPATIONAL INCIDENCE OF SNAKE BITES**

OCCUPATION	NO. OF CASES	PERCENTAGE
FARMER	81	81%
HOUSEWIFE	10	10%
STUDENT	7	7%
CARPENTER	2	2%

**TABLE 3: INCIDENCE OF POISONOUS SNAKE BITE WITH LOCAL TOXICITY**

	NO. OF VT CASES	NO. OF NT CASES
WITH LOCAL TOXICITY	34	15
WITHOUT LOCAL TOXICITY	4	7

**TABLE 4 : INCIDENCE OF LOCAL TOXICITY IN POISONOUS SNAKE BITE**

	LT	VT	NT
PAIN	8	31	11
LOCAL BLEED	11	34	3
CELLULITIS	6	22	6
GANGRENE	1	6	1

**TABLE 5: SEX INCIDENCE OF SNAKE BITES**

SEX	POISONOUS BITES	NON POISONOUS	%POISONOUS
MALE	53	15	77.9%
FEMALE	19	13	59.3%

**TABLE 6: INCIDENCE OF SNAKE BITE WITH REFERENCE TO SITE OF BITE**

SITE OF BITE	NON POISONOUS	POISONOUS
UPPER EXTREMITY	8	6
LOWER EXTREMITY	20	64
TRUNK	0	2

**TABLE 7 : RELATION OF TIME WITH SNAKE BITE**

TIME	NO.OF.NON-POISONOUS	NO.OF.POISONOUS
AFTERNOON(12-4PM)	2	4
EVENING(4-8PM)	13	38
NIGHT (8PM-6AM)	8	16
MORNING (6AM-12PM)	5	14

**TABLE 8: TYPE OF TREATMENT RECEIVED IN VASCULOTOXIC BITE**

ASV	38
DIURETICS	12
HEMODIALYSIS	5
BLOOD TRANSFUSION	2

**TABLE 9 : LOSS OF TIME FROM THE BITE TILL THE ADMISSION**

TIME	NON-POISONOUS	NO.POISONOUS			
		VT	NT	LT	D
WITHIN 6 HRS	19	20	14	2	0
6 TO 24 HRS	9	12	6	4	1
>24 HRS	0	6	2	6	4

**TABLE 10 : THE NUMBER OF PATIENTS WHO RECEIVED FIRSTAID.**

	NON-POISONOUS	NO.POISONOUS		
		VT	NT	LT
TORNIQUET	6	24	12	9
ASV	4	5	2	1
FALSE BELIEFS	8	3	3	0
NO.RX	10	6	5	2

**TABLE 11: INCIDENCE OF SYMPTAMATOLOGY OF NEUROPARALYTIC SNAKE BITE**

	NUMBER	PERCENTAGE
PTOSIS	22	100
DYSPHAGIA	9	40.9
OPHTHALMOPLÉGIA	19	86.36
UNCONSCIOUSNESS	5	22.72
FLACCID LIMB PARALYSIS	6	27.27
CONVULSIONS	0	0
CELLULITIS	8	36.36
RESPIRATORY PARALYSIS	14	63.63

**TABLE 12 : INCIDENCE OF SYMPTAMATOLOGY IN VIPERINE SNAKE BITE**

	NUMBER	PERCENTAGE
LOCAL BLEED	31	81.57
GLIM BLEED	3	7.89
HEMOPHYTOSIS	1	2.63
EPISTAXIS	1	2.63
HEMATEMESIS	2	5.26
MALENA	1	2.63
HEMATURIA	16	42.10
OLIGURIA	18	47.36
ECHYMOSES	2	5.26
ICH	1	2.63
S COLLUNCTURAL HAEMORRHAGE	2	5.26
CELLULITIS	22	57.89
ACUTE KIDNEY INJURY	18	47.36
ISCHEMIC STROKE**	3	7.89

**TABLE 13: DURATION OF NEUROPARALYTICS ON VENTILATOR**

DURATION	NO.OF CASES
<12 HOURS	8
12-24 HOURS	4
>24 HOURS	1

**TABLE 14 : COMPARATIVE MORTALITY IN POISONOUS SNAKE BITE**

	NO.OF.CASES	NO.OF DEATH	%
NP	22	3	13.6
VT	38	4	10.52
LT	12	0	0

**TABLE 15:INCIDENCE IN RELATION TO CONDITION AT DISCHARGE**

	LT	NP	VT
COMPLETE RECOVERY	12	20	13
COMPLICATIONS	0	1	21
DEATH	0	3	4

A total of 100 snake bite victims were examined. There were 72 patients with poisonous snake bites and 28 patients with non-poisonous snake bites out of 100 patients. Farmers had the highest rate of snake bites, compared to all other occupations.

In terms of poisonous bites, 53 (77.9%) more males than females (59.3%) were bitten. More people were bitten by snakes in rural regions (85%) than in cities (15%). The incidence of poisonous snake bites was higher in rural than in urban areas.

Snake bites were commonly seen on the lower extremities 84 (84%) than upper 14(14%). More bites occurred at night (75%) than during the day (25%), with 72% of the bites at night being deadly and 68% of the bites at day being poisonous.

In total, 55% of patients—of whom 20% were VT and 14% were NT—reported seeking medical assistance within six hours. 51 patients arrived with tourniquets applied, 45 of whom had been bitten by poisonous snakes, and four of whom had received ASV. Twenty three cases did not receive any sort of medical help before admission. Eight cases had received non-medical treatment.

In comparison to VT snake bites, neuroparalytic snake bites had an earlier onset of systemic manifestation. There were more VT snake bites (38%) than neuroparalytic bites (22%). Local bleeding was the most frequent VT symptom (81.57%), while cellulitis came in second (57.89%). The most frequent symptom in those patients who acquired ARF was hematuria (42.10%). The most frequent and early sign of a neuroparalytic snake bite was ptosis (100%)

Out of VT snake bites, 18 were of ARF, 5 required hemodialysis. Blood transfusions were given to two DIC patients. Thirteen ARF patients took diuretics and made a full recovery. Six of the twelve patients with LT cases had cellulitis.

Artificial ventilation was needed for 13 neuroparalytic bite victims. Five individuals passed away as a result of delaying seeking medical care until complications with systemic infection were out of control and beyond their ability to be managed. ASV caused anaphylactic

reactions in 18 patients, who had conservative treatment and fully recovered.

## DISCUSSION

According to estimates, 2 lakh Indians are bitten by snakes each year, and between 15,000 and 30,000 of those cases result in fatalities.<sup>[1]</sup> From October 2021 to October 2022, 100 cases of snake bites, both poisonous and non-poisonous, were examined at the medical wards of Government General Hospital Ananthapur for the current study.

There were 72 poisonous instances and 28 non-poisonous ones, respectively. Viperine bites made up 38 of the toxic snake bites, followed by neuroparalytic bites with 22 instances and LT cases with 12. The majority of the patients in the current study who were bitten were between the ages of 14 and 30. The age range of 31 to 50 years ranked next in terms of frequency.

These findings support the research of Russell et al. (1979)<sup>[2]</sup> and Hutchison et al. more strongly (1929). 40 patients in the 14–30 age range and 26 patients in the 31–50 age range both suffered from toxic snake bites. Six bites in the age group above 51 were poisonous in nature, in support of the research of Hutchison et al. and Russell et al. (1979)<sup>[2]</sup>. (1929). 40 patients in the 14–30 age range and 26 patients in the 31–50 age range both suffered from toxic snake bites. Six of the bites in the age group over 51 were toxic.

In the current study, 32 (32%) of the patients were female victims, compared to 68 (68%) of the patients who were male victims. The same findings are mentioned in every preceding report. In 1954, Ahuja<sup>[3]</sup> and Singh reported that the ratio was 4:1. (M: F). According to Bhat<sup>[4]</sup> et al., the incidence was 7:3 in 1974. (M: F). Male patients had 53 poisonous bites, whereas female patients had 19 poisonous snake bites. There were 81 farmers, 7 students, 10 housewives, and 2 carpenters in the current study. Researchers Bhat et al. (1974), Saini et al. (1984), and Sarangi et al. (1977) found that the frequency was 75%, 78%, and 72%, respectively, among farmers. In the current study, 82 out of 100 snake bite incidences were in rural areas. 64 of these involved bites from deadly snakes. Eight of the 18 incidents per 100 that occurred in metropolitan areas were toxic.

In this study, 55 individuals (55%) were admitted during the first 6 hours. Twenty (20%) of the patients were VT and fourteen (14) were neuroparalytic. 32 patients, including 12 VT patients and 6 NT patients, were admitted within the first 24 hours but after 6 hours. In a study by Lahori et al. that included 135 patients, 85% of patients were admitted within the first 24 hours of the bite.

51 (51%) of the 100 patients had used a tourniquet. Six non-poisonous bites and 45 poisonous bites were reported across 51 patients. In 51 occurrences of poisonous bites, there were 24 VT bites, 12 neuroparalytic bites, and 9 LT bites. In a research by George Watt et al. (May 1988), 94% of patients had tourniquets applied; 4 of them were asymptomatic before the tourniquet was released, and 11 patients experienced a sharp worsening of their symptoms.

In 22 (57.89%) patients with VT snake bites and 6 (27.27%) patients with neuroparalytic snake bites, local cellulitis was observed. In the current investigation, local bleeding was found in a total of 48% of the participants. 34 patients had VT bites, 3 patients had neuroparalytic snake bites, and 11 patients suffered LT bites. 3 (12%) of the patients in the current study showed gum bleeding, while Purohit (1944) identified gum bleeding as the most typical symptom of a viper bite.

Hematuria was listed as the most common manifestation by Corkill<sup>[5]</sup> (1956), whereas in the current investigation, 16 individuals (42.10%) showed hematuria. Ecchymosis was present in 2 (5.26%) of the patients in the current investigation, but 43% of the patients according to Bhat (1974) had ecchymosis. In contrast to Bhat's findings, which showed that 37 patients out of 310 patients developed hematemeses, hematemeses was found in 2 (5.26%) patients in the current study. One patient (2.63%) and one (2.63%) in the current study, respectively, suffered epistaxis and hemoptysis. Similar findings were also seen in a study done by Gaurav Bhalla, Dhanesh Mhaskar and Anubhav Agarwal (2014).<sup>[6]</sup> But ischemic stroke following snake bite is seen in 3 patients in our study.

In the current study, 22 incidences of Neuroparalytic bite resulted in 100% of patients developing ptosis. Nineteen (86.36%) patients with

neuroparalytic bites experienced ophthalmoplegia. Five patients (22.72%) lost consciousness, six (27.27%) suffered flaccid limb paralysis, and 14 (63.63%) acquired respiratory paralysis, 13 of whom required a ventilator.

In 22 (57.89%) patients with VT snake bites and 6 (27.27%) patients with neuroparalytic snake bites, local cellulitis was observed. In the current study, local bleeding was found in a total of 48% of the participants. 34 patients had VT bites, 3 patients had neuroparalytic snake bites, and 11 patients suffered LT bites. Although gum bleeding was evident in 3 (12%) of the patients in the current investigation, Purohit (1944) described gum bleeding as the most typical symptom of viperine bit.

ARF was observed in 18/38, or 47.36%, of the VT bite victims. Except for one instance, DIC was the root cause of ARF. In 27 cases of snake bites, ARF was noted by Basu et al. (1977), who linked it to circulatory collapse and shock in 5 cases and direct nephrotoxicity in 4 cases. In the current study, 7 patients with poisonous snake bites died, including 3 patients who experienced neuroparalytic bites and 4 patients who experienced VT bites. The fatality rate among bites that were neuroparalytic (13.6%) was higher than the VT bite (10.52%). Due to a delay in providing respiratory aid, all 4 victims expired.

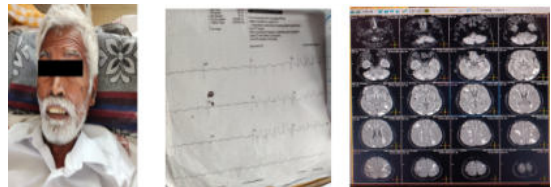
Three patients died of acute renal failure of the four VT bite deaths, while one patient died of DIC and intracerebral haemorrhage. According to Lahori et al. (1981), the central nervous system (CNS) was involved in 3 deaths, which represented a mortality rate of 2%.

In the current investigation, steroid and adrenaline treatments were administered to 18 individuals who experienced anaphylaxis to ASV. 72 patients received ASV as part of the current trial. ASV is not very effective at counteracting the local effects of venom, claim Reid et al. Neostigmine and atropine were administered to 22 individuals in the current study who had suffered a neuroparalytic snake bite. Within 4-6 hours, the majority of the patients responded to it. In these patients, respiratory paralysis was the first to improve, followed by ophthalmoplegia and ptosis. Strong proponents of this regime include Dubay et al. (1981), Banerjee et al., and Dash et al. (1976), while Reid expressed reservations about its efficacy.

## ISCHEMIC STROKE IN SNAKE BITE

We observed 3 occurrences of ischemic stroke after snake bite in our study, which is quite uncommon. One of these is extremely uncommon because the patient experienced both an ischemic stroke and IHD after being bitten by a viper.

A 60-year-old man who had been bitten by a viper presented to emergency department with ptosis and diplopia but no bleeding symptoms. Early ECG results were normal. patient was treated with 20 vials of ASV. After about 30 hours patient complained of weakness of left upper limb and lower limb. A Ct scan of the brain revealed infarcts in the right and left parietal lobes. Multiple infarcts in the bilateral occipito parieto frontal lobes of the brain were detected on an MRI scan, which is suggestive of acute infarcts in the bilateral MCA and posterior circulation. A subsequent ecg revealed slight inferior and lateral st segment elevation. The 2D echo revealed moderate LVD and IHD in the LAD territory.



### Potential causes of an ischemic stroke after a snake bite:

Venom from viper snakes is a sophisticated toxin with a variety of components that mostly disrupt haemostatic processes. Massive intravascular coagulation brought on by high dosages of venom can result in minor and even big artery occlusions, which can induce cerebral infarction. Thrombosis can occur as a result of toxic vasculitis brought on by some viperine species.<sup>[7]</sup> According to Bashir and Jinkins<sup>[8]</sup>, the venom may directly affect vascular endothelial cells. Hemorrhagins, which are toxic, complement-mediated components of viperidae snake venom, can cause endothelial damage, severe vascular spasm, increased vascular permeability, and vascular occlusion. Vascular occlusion may also be produced by hypercoagulation brought

on by procoagulants such as arginine, esterase, and hydrolase, as well as hyperviscosity brought on by hypovolemia and hypoperfusion owing to hypotension.

- The infarcts in our patient are not in a classical watershed territory and therefore do not suggest hypotension as the cause.
- Clotting time was normal and ruled out coagulopathy as cause.
- The possible cause of infarct in MCA as well as posterior circulation is due to toxic vasculitis caused by injury to the endothelium by snake venom toxin.

### CONCLUSION

Following a snake bite, priority should be placed on quick identification and treatment because the period of time between the bite and the intended course of action is the single most crucial factor in deciding survival.

To neutralise the most circulating venom before it is fixed in tissue, ASV must be administered early. Therefore, it should be given to cases with evidence of systemic envenomation as early as possible.

Ischemic stroke following snake bite is rare but in our study we have seen 3 cases so, physician should always be aware of ischemic complications following snake bite as well and their possible mechanisms.

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