

Original Research Article

## **Snakebite Envenoming in Andhra Pradesh (Khammam Region), South India: An Experience of 30 Cases**

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**Abstract:** India is the largest single contributor to the global tally of snakebite deaths, with the numbers ranging 15,000-50,000 a year. Study of profile and pattern of snakebite is essential to provide pertinent information to the concerned authorities in order to manage snakebite appropriately. This study was done to find out area specific pattern of snakebite and factors related to outcome of such cases. The present prospective study was carried out in the Department of Forensic Medicine, Mamata Medical College and Hospital, Khammam, Andhra Pradesh for a period of 12 months i.e. during July 2011 to June 2012. Patients of snakebite poisoning seeking care at this tertiary care institution formed the study population. At the time of admission a thorough case history regarding the type of snake, time of snakebite, site of snakebite, the signs and symptoms, and any first aid measures was taken. People aged up to 40 years received more than half of snakebites. Maximum proportion of snakebites was experienced in the age group of 31-40 years. Gender wise males outnumbered females. Majority (50%) of snakebite victims were agricultural laborer working in the agricultural fields. Remaining study subjects were laborer, housewives, students and others. In majority (10/30) of cases Krait was responsible for bite followed by viper and unknown. Cobra was responsible for 4 bites out of 30. Most of the snakebites were reported in monsoon season. 43.5% of snakebite victims received first aid from a local PHC. This study highlights area specific profile, pattern of snakebite and other factors, which may provide pertinent information to the concerned authorities in order to manage snakebite appropriately.

**Keywords:** Incidence, Epidemiological study, Rural, Snakebite, South India, First aid

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### **INTRODUCTION**

Snakebite is one of the significant causes of global morbidity and mortality. It has been estimated that 5 million snakebite cases occur worldwide every year, causing about 100,000 deaths [1]. Snakebite is a significant public health problem in many parts of the world, especially in South Asian countries. India is the largest single contributor to the global tally of snakebite deaths, with the numbers ranging 15,000-50,000 a year [2]. The data on the morbidity and mortality of snakebite are unreliable due to an improper reporting system, as many victims of snakebite choose village-based traditional therapists [3].

Bites usually result from an unfortunate accidental interaction between a snake and a human victim. It occurs mostly when the people are at work like cultivation, gardening, plantation, wood collection, watching the crops even during walking [4]. Mortality after snakebite depends on various factors, such as amount of venom injected, site of bite (the condition is serious if the bite is on the trunk or head, neck, and face), species and size of the snake, and the presence of bacteria in the mouth of the snake or on the skin of the victim at the time of the bite [5, 6].

In recent times intensive works are being done on the pharmacological, pathological, toxicological and immunological aspects of snake venoms to give a better

break to the snake bite victim, which has resulted in production of polyvalent and monovalent anti snake venoms, which in turn has reduced the mortality rate significantly. The study of the profile and pattern of snakebite is essential to provide pertinent information to the concerned authorities in order to manage snakebite appropriately.

## MATERIALS AND METHODS

The present prospective study was carried out in the Department of Forensic Medicine, Mamata Medical College and Hospital, Khammam, Andhra Pradesh for a period of 12 months i.e. during July 2011 to June 2012. Patients of snakebite poisoning seeking care at this tertiary care institution formed the study population. Purposive sampling technique was adopted. A total of 30 patients were enrolled in this study.

Mamata Medical College is a tertiary care teaching hospital equipped with ultra modern multi super specialty facilities and referral unit of Andhra Pradesh. The hospital receives major chunk of its patients not only from Andhra Pradesh but also from neighboring states. Thus this tertiary care hospital provided us a perfect base to study such an objective.

All the cases that reported to the casualty with the history of snakebite were considered for the study. At the time of admission a thorough case history regarding the type of snake, time of snakebite, site of snakebite, the signs and symptoms, and any first aid measures was taken. Inquiry was also made about the preliminary data of the victim, such as age, occupation and domicile. In few cases, the history is elicited by the patient himself but in certain cases by the close relatives or by the accompanying people. Physical examination, which included all the relevant systems, was carried

out. The history and the findings were documented in a specially designed proforma.

The study adhered to the tenets of the Declaration of Helsinki for research in humans. Informed consent was obtained from study subjects after discussing advantages and risks. Permission of Institutional ethics committee (IEC) was sought before the commencement of the study. All the questionnaires along with other relevant data were manually checked and were then coded for computer entry. After compilation of the collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 20 (IBM, Chicago, USA). The results were expressed using appropriate statistical methods.

## RESULTS

We analyzed data of 30 snakebite patients seeking care at Mamata Medical College and Hospital, Khammam. Majority of study subjects were young. People aged up to 40 years received more than half of snakebites. Maximum proportion of snakebites was experienced in the age group of 31-40 years. Gender wise males outnumbered females. (Table 1).

Majority (50%) of snakebite victims were agricultural laborer working in the agricultural fields. Remaining study subjects were laborer, housewives, students and others. (Table 2)

In majority (10/30) of cases Krait was responsible for bite followed by viper and unknown. Cobra was responsible for 4 bites out of 30. Most of the snakebites were reported in monsoon season. (Table 3)

43.5% of snakebite victims received first aid from a local PHC. (Figure 1)

**Table 1: Age and gender wise distribution of study subjects**

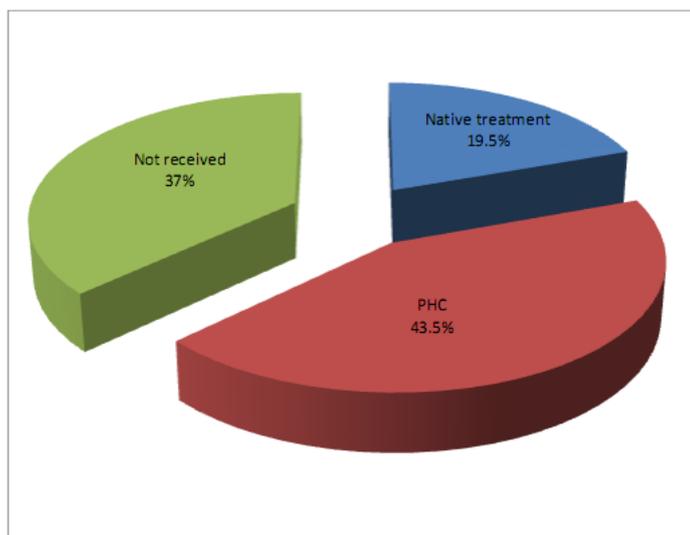
Age	Gender		Total (%)
	Male (%)	Female (%)	
11-20	4 (17.3)	1 (10.9)	5 (21.7)
21-30	6 (26.1)	2 (10.9)	8 (26.1)
31-40	6 (26.1)	2 (13)	8 (30.4)
41-50	1 (4.3)	1 (2.2)	2 (6.5)
51-60	3 (13.0)	1 (2.2)	4 (8.7)
61-70	1 (4.3)	0 (2.2)	1 (4.3)
71-80	2 (8.7)	0 (0)	2 (2.2)
<b>Total</b>	<b>23 (76.7)</b>	<b>7 (23.3)</b>	<b>30 (100)</b>

**Table 2: Occupation wise distribution of study subjects**

Occupation	Frequency	Percentage (%)
Agricultural Laborer	15	50.0
Laborer	5	16.6
House Wife	4	13.3
Student	4	13.3
Others	2	6.6
<b>Total</b>	<b>30</b>	<b>100</b>

**Table 3: Type of Snake and Season wise distribution of study subjects**

Type of Snake	Seasons			Total
	Summer	Monsoon	Winter	
Cobra	0	3	1	4
Krait	1	8	1	10
Viper	0	8	0	8
Unknown	2	5	1	8
<b>Total</b>	<b>3</b>	<b>24</b>	<b>3</b>	<b>30</b>



**Fig-1: Pie chart showing First Aid wise distribution of study subjects**

**DISCUSSION**

In view of the monetary benefits given by the Government of Andhra Pradesh, India, under the scheme Apathbandhu to the dependents of those who die due to snake-bite, several false cases of snake-bite have also been reported for claiming the compensation. Hence, it is of immense importance for the forensic experts to detect or quantitate the snake venom residue in autopsy specimens of snake- bite victims so as to ascertain the exact cause of death and to prevent false claims [2].

In this study it was observed that maximum proportion of snakebites was experienced in the age group of 31-40 years. Gender wise males outnumbered females. Study conducted by Bayappa Reddy N also observed the high incidence of snake bite in the age group 31-40 years and males were predominantly affected than females [7]. It could be due to the fact that males are usually more active outdoors as compared to females thus more exposed to snakebite.

We observed that maximum incidence of snakebites occurred while doing agricultural works. These may be because of the reason that agriculture is the main occupation in the study area. Men and woman agricultural labourers work in the fields and naturally get exposed to snakes. Frogs and other small amphibians are found in plenty during the monsoon

season and the rodent activity is increased during the time of harvest. This naturally attracts the snakes to the fields for the search of their prey. This may increase the risk of exposure of the agricultural labourers and the people walking near the fields to snake bites. Students in the rural areas walk bare foot to school crossing the field and so they are also exposed to the risk of snakebites.

Incidence of snakebite is high in the monsoon season and least in summer season. This is due to the fact that in the monsoon season due to heavy rainfall, water fills up the snakes pits and forces them to come out of it in search of a safe habitat and prey, as this season also attracts the rodents to the fields. There is increased human activity in fields in this period as it is the sowing season, thereby increasing the risk of snakes getting in accidental contact with human. In summer the snakes will hibernate in cooler places and will be very active in the monsoons only. This can be the reason of less number of snakebites recorded in summer. A similar trend was observed in the studies conducted by various authors [8-10].

In this study it was observed that 43.5% of snakebite victims received first aid from a local PHC. It can be stated that the situation is improving as more number of people are getting first aid as compared to past where only a few used to receive first aid treatment

at the site of incident. This could be due to the increasing awareness regarding the falsity in native treatments, fear and anxiety in the peoples mind regarding snakebite. Study conducted by Atif Sitwat Hayat *et al* and Phalke DB is consistent with our study [11-12].

### CONCLUSIONS

This study highlights area specific profile, pattern of snakebite and other factors, which may provide pertinent information to the concerned authorities in order to manage snakebite appropriately. There is need for further improving community education regarding the necessary precautions to be taken against snakebites. Ensuring receipt of first aid at the site of incident and prompt transport of bitten patients to health care facilities may reduce the number of snakebite deaths.

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