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# Myths and Misconceptions around Snake bite: KAP Study in Rural Bastar, Chhattisgarh

**Gajendra Singh[1], Teeku Sinha[2], Meenal A Indurkar[3]**

**Author's Affiliation:** [1]Public Health Specialist, New Rajendra Nagar , Raipur, Chhattisgarh, [2]Associate Professor, Department of Community Medicine, Govt. Medical College, Jagdalpur, Chhattisgarh, India, [3]District Consultant, Department of Public Health, Saathi Samaj Sevi Sanstha, Chhattisgarh.

**Corresponding Author: Gajendra Singh,** Public Health Specialist, New Rajendra Nagar , Raipur 492001 Chhattisgarh.

**E-mail:** talk2me@doctor.com

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**Abstract**

*Context*: Snakebite is common problem in rural India and common in dense forest area like Bastar region of Chhattisgarh. Tribal people have their local remedies for its treatment. Uninformed community members resorting to harmful traditional measures may cause vital time loss for patient's survival. *Aims*: Study is conducted to assess the knowledge, myths and misconceptions around snake bite in rural area of Bastar, Chhattisgarh. *Settings and Design*: An observational, cross sectional study was conducted in eight villages of Bastar, Chhattisgarh. *Methods and Material*: Data was collected using a pre-designed and pre-tested schedule for interviews. *Statistical analysis used*: Microsoft Excel XLSTAT and the results were calculated in frequencies and percentages. *Results*: Farming was the main profession (40%) and only 66.2% of the study population was aware that the incidence of snakebite can be reduced. About 33.8% were aware that initial first aid measure was to immobilize the affected part and only 26.9% were aware that the application of the collar was unnecessary and harmful. Correct knowledge on the availability of specific treatment was present in about 56.2% and only 50% knew where specific treatment is available. *Conclusions*: Study shows scarcity of knowledge on the first aid following snake bite and misconceptions on the role of snake charmers. Therefore, there is an imperative need to educate community on first aid treatments and their belief in tantric or Baiga for traditional treatments methods for snake bites. There is a need to implement awareness programs on snake bite in at risk communities of Bastar region.



**Keywords**: Snake bite, Bastar, Chhattisgarh, Knowledge, Myths

## Introduction

Globally, it is estimated that annually 5.4 million venomous snake bites and out of that 2.5 million bites are envenoming resulting in 1,25,000 deaths. According to recent figures by the World Health Organization (WHO), it is estimated that in India, every year there are 83,000 snake bites and 11,000 deaths due to snake bite. India recorded a staggering 1.2 million snakebite deaths in the 20-year period from 2000 to 2019 with an average of 58,000 deaths caused by snakebite. Snakebite remains an underestimated cause of accidental death in modern India. Because a large proportion of global totals of snakebites arise from India, global snakebite totals might also be under estimated.[3]

Snake bite deaths and envenomation are largely neglected topics in global health. However, in 2017, the WHO included snake bite envenoming in the priority list of neglected tropical diseases[4] and launched in 2019 a strategy for prevention and control of snake bite, aiming to halve the numbers of deaths and cases of serious disability by 2030 as compared to 2015 baseline.[5] Achieving this goal will require substantial progress in India, which is home to approximately half of global snakebite deaths.

Chhattisgarh is not spared from Snake bite. As per HMIS, the snakebite prevalence rate in 2017-18 was 22.6 per 100,00 population in 2018–2019. Similarly, mortality rate due to Snake bite was 1.85 in 2017-18 and 1.59 in 2018-19.[6] Bastar is one of the densely forested (75%) tribal districts situated in the southern part of Chhattisgarh State. Tribals like Gonds, Abujhmaria, Dandmaria, Muriya, doriya, Bhatra and Halba are 70 percent of the total population. All tribals depend on forest resources for health security and livelihood; therefore, they are more likely to suffer from snake bites.[7] Occupational adult males of this area such as farmers, plantation workers, herdsmen and other outdoor workers who have little knowledge of snakes have often been bitten by snakes as they do not take necessary precautionary measures to prevent snake bite such as wearing gloves, boots, etc. Either attributable to unaffordable situations, or due to the discomfort associated with their use in varying weather conditions. Snakes have been worshiped, hated, or loathed in India since ancient times. Out of total 236 species in India, 13 are poisonous. Cobra, Russell's viper, saw-scaledviper and common trait are highly poisonous and cause most of the bites. Sadly, in the everyday lives of millions of villagers in India, snakes remain a painful reality. Snake bite patients frequently try traditional healers and get faulty first aid treatment before coming to the hospital. As state in India.[10,11,12]

Bites by venomous snakes can cause acute medical emergencies involving shock, paralysis, haemorrhage, acute kidney injury and severe local tissue destruction that can prove fatal or lead to permanent disability if lef tuntreated. Most deaths and serious consequences from snakebite envenomation (exposure tovenom toxins from the bite) are avoidable by timely access to safe and effective antivenoms.[13]

Improper first aid in snake bites does more harm than benefit.[14] Most experts agree that victims of snake bite should be transported promptly to a medical facility where they should be assessed by qualified medical practitioners and there should be readily available anti-venom. Time of transport is a key determinant of mortality from the snake bite. Poorly informed rural populations take inadequate first aid steps and vital time is lost in moving the patient to the medical facility. Mostly, the victims report to the traditional healers. Traditional methods include chanting, incisions, venom sucking attempts, the use of herbal medicines, and snake stones.These are not just ineffective; they can be harmful and deleterious in most cases. Tourniquet application is commonly practiced but it causes severe local damage which further aggravates the condition. Despite being such a significant public health issue, there is a lack of community-based research to assess awareness of snake bite in rural populations. With the development of positive health strategy and rapid urbanization with the expansion of human colonization, it is important to better understand the problem for preventive and therapeutic measures to reduce mortality and morbidity associated with snakebite in Bastar Region of Chhattisgarh.

Therefore, it is necessary to identify the gaps in snakebite knowledge and to take appropriate measures to increase and percolate correct knowledge about snake bite prevention, control and management. The present study is an attempt on this largely overlooked topic to assess the awareness of a selected rural population of Bastar region.

### *Objectives*

- To study population demographic and socio-economic characteristics of the study population.
- To ascertain the study population's knowledge of first aid measures following snake bite.
- To show the association of different demographic and variables with the knowledge on snake bite.

### *Subjects and Methods:*

*Study settings*

The study was done in the eight villages of Bastar. Timeline of study was between Sep–Nov 2018.

*Study design*

The study was descriptive and cross sectional in mode of data collection through interview.

*Study Tools*

A questionnaire was developed in local language. The questionnaire was pretested before it was finally made ready. The questionnaire consisted of two parts.

*Section A*, consisting of socioeconomic factors: Education, occupation, and income and demographic factors: Age, and Sex.

*Section B*, contained knowledge questionnaire which was subdivided into three parts:

- Part 1 – contained general idea about poisonous

and non –poisonous snakes.

- Part 2 - contained questions on first aid to be undertaken following snake bite.
- Part 3 –questions on transport and availability of specific treatment of snake bite.

*Study techniques*

Head of the family (HOF) of each household was selected for interview. It was assumed that knowledge of HOF reflects the knowledge of other family members. In their absence the next senior member was interviewed.

*Study variables*

- *Socio demographic*: Age, Sex, Education and Occupation.
- *Socioeconomic*: Per capita income

A score of one was awarded for the correct answer and zero for wrong answer.

*Data Analysis*

Statistical analysis using Microsoft Excel XLSTAT was done for frequencies and percentages. We performed multivariable analysis, using Chi-Square Test with $\alpha$=0.05% and p-value< 0.0001 level of significance, to calculate the extent of participant knowledge and its association with demographic and socio-economic parameters. Knowledge on snake bite was assessed by the scoring system dichotomized by the median score. Those having score above median i.e. ten were considered having good knowledge.

The participants were made aware of the nature and purpose of the study. They were assured of the anonymity and confidentiality of the information provided by them and data obtained would be used solely for academic purposes.Even if they refused, they would continue to receive the same medical benefits as they were enjoying previously.

## Results

Out of the total 130 participants,91 (70%) were male. 57 were from age group 31-40 years while 26 from 21-30 years, 23 from 41-50 years and 13 were from age group of 51-60 years. 7 people were above 60 and 4 were below 21 years of age. 25% participants had studied up to primary education while 40%studied up to middle school followed by 12% (graduation or above). 23%were illiterate. 40% were farmers (40%) and 17.7% were doing business and 13.8% in jobs.

As per table 1 the correct knowledge of snake

**Table 1**: Distribution of Study Population according to correct knowledge on Snakebite

| Question | Correct Response In % |
|---|---|
| General knowledge on snakes and snakebites (n=130) | |
| Are all snakes venomous | 82 (63.07%) |
| Common snakes in this region | Krait (1), Nag(2), Dhamana (3) |
| Identification of snakes | 116 (89.23%) |
| Is it possible to decrease incidence | 86 (66.2%) |
| Does every snake bite cause death | 87 (66.9%) |
| Measures to reduce snake bite (n=130) | |
| Cleanliness around house | 118 (90.8%) |
| Use of torch | 122 (93.8%) |
| Use of boots and gloves | 32 (24.6%) |
| Snakes charmers | 103 (79.2%) |
| Knowledge on first aid measures (n=130) | |
| Immobilization of affected part | 44 (33.8%) |
| Application of ice | 123 (94.6%) |
| Use of sharp object | 106 (81.5%) |
| Use of tight collar | 35 (26.9%) |
| Spread of venom | 73 (56.2%) |
| Use of Ayurvedic medicines or local herbs | 100 (76.9%) |
| Belief in tantrik or baiga | 98 (75.4%) |
| Knowledge on the availability of specific treatment | |
| 1.whether specific treatment is available | 73 (56.2%) |
| 2.antevenom availability | 65 (50%) |

bite among the study population. It was found that 63.07% knew that all snakes are not poisonous and 66.9% knew that all bites do not result in death however, only 66.2% of the study population were aware that the incidence of snake bite can be reduced. But there remains a misconception on the role of snake charmers with only 24.6% providing answers regarding their utility. Regarding the knowledge on first aid measures only 33.8% were aware of immobilization of the affected part. But application of tight collar around the affected part was an important first aid measure by majority and only 26.9% had the correct knowledge. 94.6% of the participants had correct knowledge on the application of ice. Regarding the local application of sharp object 81.5% correct responses were obtained. Correct knowledge on availability of specific treatment was present among 56.2% and 50% knew where specific treatment is available.

**Table 2** : Association of knowledge on snakebite with demographic and socio-economic factors

| Explanatory variables | Good knowledge score | p value |
|---|---|---|
| Age | | |
| <40 years | 29 | 0.032 |
| >40 years | 73 | |
| Education | | |
| Primary and high school | 38 | <0.0001 |
| UG and PG | 64 | |
| Occupation | | |
| Farmer and labours | 45 | <0.0001 |
| Business, student, govt service | 57 | |
| Income | | |
| <Rs 10000 | 82 | 0.041 |
| >Rs 10000 | 20 | |

As per Table – 2, the association of knowledge on snake bite with demographic and socio-economic factors. Knowledge on snake bite was assessed by the scoring system dichotomized by the median score. Those having score above median i.e. ten were considered having good knowledge. Analysis revealed that Education (<0.0001) and occupation (<0.0001) were significantly associated with good knowledge. All these variables were entered in multivariable analysis. p-value <0.0001 is used as level of significance.

## Discussion

Snake bite is a dangerous issue and most research on snake bite have been conducted in hospital settings. There are rare Community baseline studies on this topic in India. A cross-sectional Community-based study among 130 households in rural Bastar revealed very little awareness in all subjects.This emerged however that educated people have more knowledge than the uneducated people (with p <0.001). Education was significantly associated with knowledge in the present study. There was suboptimal knowledge about some measures of first aid, such as collar application and wound sucking, while fair knowledge was prevalent in other fields.

A study was conducted in rural Sri Lankan where 176 part-time and full-time farmers' awareness and perceptions were studied. 89.5 percent of the study participants were aware that the initial first aid step was the immobilization of the affected portion compared to 68 percent in the present study. In 74.9 percent of cases, the application of tight band (tourniquet) proximal to the bite site was considered as an effective first aid measure whereas in our case it was 26.9 percent. 98.3 percent of the people suggested that cleaning the area without leaf litter and grass around the house was considered an important preventive measure. In this study 90.8 percent reported that weed cleaning could lead to a reduction in the incidence of snake bites. 86.8 percent of the individuals in the Srilankan study preferred western treatment from a government hospital. In the present study, 56.2 percent of the study population acknowledged that specific treatment was available at government facilities. Lack of anti-venom availability in district hospitals of Chhattisgarh is found to be the major cause of death due to snake bite. In present study, 50 percent reported the lack of knowledge on availability of anti-venom medication for specific treatment.

To save lives, it is imperative that measures to reduce delays in getting patients to hospital must be included in snakebite management, alongside

continued availability of antivenom and assisted ventilation. Snake bite is a neglected, life-threatening emergency in developing countries such as India and demands immediate anti-venom therapy. Hospital studies are a key source of information about snake bites. The ready availability and appropriate use of AVS, close monitoring of patients, the institution of ventilator support and if required, early referral to a larger hospital all help to reduce the mortality. Thus, knowledge of the varied clinical manifestations of snake bite is important for effective management in hospitals by a complete health care team.

**Conclusion:**

This study points to some lacunae in the snake bite knowledge. These gaps shall be addressed at the personal, community and government level. Personal protective measures should be emphasized in an agricultural country like India. It is important to encourage the use of gumboots, LED torches at night and keep the area clean by removing the weeds. Lack of community awareness to reduce snake bite incidence remains an area of concern. Right first aid measures should be propagated among villagers so they can take the right first aid measures and send the patient to appropriate treatment facilities. Community-based awareness programs on the prevention and treatment for snakebite should be implemented. People should be aware that the saying not every snake bite is 100 percent lethal. It is curable if adequate, timely medical treatment is provided to the patient. At government level, the peripheral health workers should be trained with the 2007 national Community Health workers should be trained for treatement according to National Snake bite protocol (2007). Availability of Anti Snake Venom Should be ensured in health facilities at all levels for prompt treatement.

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