

Snakebite and its management in rural West Bengal: The unspoken truth

Aditi Chaudhuri¹, Siddalingaiah H S², Partha Pratim Pal¹, Murari Mohan Mondal¹, Raghunath Misra¹

¹Department of Community Medicine, Institute of Postgraduate Medical Education and Research, Kolkata, West Bengal, India, ²Department of Community Medicine, Shridevi Institute of Medical Sciences and Research Hospital, Tumkur, Karnataka, India

Correspondence to: Siddalingaiah H S, E-mail: hssling@yahoo.com

Received: May 09, 2019; Accepted: May 31, 2019

ABSTRACT

Background: Snakebite is a common medical emergency in tropical India where agriculture is a major source of earning livelihood. Snakebite has a significant impact on human health and economy. The situation worsens when the majority of snakebite victims adopt harmful practices such as application of tourniquets due to prevalent myths and misconceptions. **Objectives:** The objective of the study was to study the sociodemographic profile of the study population, to estimate the prevalence of snakebite in the study area, and to assess the knowledge and treatment seeking behavior of the study population regarding snakebite and its management. **Materials and Methods:** A total of 135 households of Muchisa village of West Bengal were selected by consecutive sampling and one adult member of the household was interviewed with a predesigned schedule. **Results:** Majority of the study population were in the age group of 30–60 years (69.5%), females (52.6%), and Hindu (74.8%). Nearly 59.1% (100) of the population were educated up to primary level. Nearly 15.56% of the study population in our study gave a history of snakebite. Nearly 81.1% of study population correctly differentiated between poisonous and nonpoisonous snakebites based on signs and symptoms of the victim. When asked about why snakebite, the villagers said that snakebite when they were touched (57.04%) or hit (33.33%). About 57.78% of the population believed that snakebite can be managed by traditional faith healers (Ojha). The majority preferred tying a tourniquet/similar material above the bite mark. **Conclusion:** It is essential to communicate about the appropriate management of a snakebite victim to the communities at risk of snakebite.


KEY WORDS: Snakebite; Traditional Management; Faith Healers; Myths; Misconceptions

INTRODUCTION

The World Health Organization (WHO) has declared that snakebite is one of the most neglected tropical diseases.^[1] The WHO estimates that around the world about 2,500,000 venomous snakebites occur per year resulting in 125,000 deaths, of which 100,000 are in Asia. The Million Death Study by Government of India supports the figure given

by WHO about the incidence of snakebite mortality, which states it to be approximately 50,000/year and the highest in the world.^[2,3]

India has remained notorious for its snakebites of *Elapidae*, *Colubridae*, and *Viperidae*. Envenomation from the Viper group is mainly hematotoxic, while that from the elapid group is mainly neurotoxic. The post snakebite complications include tetanus, gangrene, neurological, and nephrological disorders.^[4-6] Often, the victims of snakebites are young and active individuals.^[1,4,7] Snakebite is predominantly an occupational hazard of farmers, plantation workers, herdsmen, fishermen, etc.^[1,2] Bites are common while people are walking barefoot on rural tracks, especially at night without a torch or other light source. Snakebite has been recognized as an important occupational disease for the Southeast Asian region.^[1]

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2019.0515631052019	

International Journal of Medical Science and Public Health Online 2019. © 2019 Siddalingaiah H S, et al. This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), allowing third parties to copy and redistribute the material in any medium or format and to remix, transform, and build upon the material for any purpose, even commercially, provided the original work is properly cited and states its license.

In West Bengal, the number of reported hospitalized snakebite cases in the year 2011 was 20,835 with 380 deaths. Besides having a tropical climate, West Bengal has diverse snake fauna in a rural area where 70% of the population earn their living by agriculture, live in risk-prone kutchas and economic distress. The situation worsens when the majority of snakebite victims adopt harmful practices such as application of tourniquets, incising and sucking the wound, use of herbal remedies, and venom stone after bite.^[1,2,8,9] Prevalent myths and misconceptions result in the adoption of different irrational and unscientific snakebite management practices.^[1,8,10] Thus, misconception and false belief among common people have left the snakebite victims at the mercy of traditional faith healers leading to an increased burden of morbidity and mortality.

With the above background, a community-based study on awareness of snakebite management among the adult population of rural West Bengal was conceived with the following objectives:

Objectives

The objectives are as follows:

- i. To study the sociodemographic profile of the adult population of Muchisa Village of Budge Budge II Block, South 24 Parganas, West Bengal
- ii. To assess the knowledge and treatment seeking behavior of the study population regarding snakebite and its management

MATERIALS AND METHODS

The present study was the observational type with a cross-sectional design conducted in December 2017 in Muchisa village of Budge Budge II community development block in South 24 Parganas of West Bengal. Prior approval of Institutional Ethics Committee was obtained to conduct the study.

According to Census 2011, Budge Budge II includes 64 inhabited villages with a total population of 192,134. Muchisa with a population of 4023 and 1280 households is the sixth largest village in Budge Budge II Block and has been adopted as the field practice area of the Department of Community Medicine, Institute of Postgraduate Medical Education and Research (IPGMER). In our study, we considered 10% of the households, i.e., a total of 128 households as samples. An extra 5% of 128 samples, i.e., seven more samples were added to account for any missing data.

During data collection, the first household of the village was selected randomly. A glass bottle was rotated on the ground in the middle of the village, and the house toward which the mouth of the bottle pointed was considered as the first sample. Thereafter every consecutive household living on the on the right-hand side of the first house was considered as

the samples until data collection from 135 households were completed. One cooperative adult member of each household who was available during the data collection period and gave informed verbal consent was interviewed with a pre-designed, pre-tested structured schedule.

The schedule consisted of three parts – the first part consisted questions on the sociodemographic profile of the study population, the second part on the history of snakebite among the study population, and the last part on knowledge and treatment seeking behavior of the study population regarding snakebite and its management. Assessment of knowledge was done by comparing the answers of the study population against the worldwide accepted Reassurance, immobilization, go to hospital, tell the doctor (RIGHT) protocol for initial first aid after snakebite. During data analysis, we got no missing data and the final result of the study was based on 135 samples.

RESULTS

Majority of the study population were in the age group of 30–60 years (69.5%), females (52.6%), and Hindu (74.8%). About 59.1% (100) of the population were educated up to primary level and more than 50% had reported to have per capita income <Rs. 1000 [Table 1]. About 15.56% of the

Table 1: Socio-demographic profile of the study population (*n*=135)

Variable	Category	N (%)
Age (years)	Below 30	22 (16.2)
	30–60	94 (69.5)
	Above 60	19 (14.07)
Sex	Male (M)	64 (47.4)
	Female (F)	71 (52.6)
Religion	Hindu (H)	101 (74.81)
	Muslim (M)	34 (25.19)
Per capita monthly income (Rs.)	<500	13 (9.63)
	500–1000	66 (48.89)
	>1000	56 (41.48)
Education	Illiterate	39 (28.8)
	Primary	41 (30.3)
	Middle school	21 (15.5)
	Secondary	18 (13.3)
	Higher secondary	8 (5.9)
Occupation	Graduate	8 (5.9)
	Professional	0 (0)
	Semi professional	9 (6.67)
	Skilled worker	25 (18.52)
	Semi-skilled worker	30 (22.22)
	Unskilled worker	40 (29.63)
	Unemployed	27 (20)

study population in our study gave a history of snakebite [Figure 1].

About 81.1% (110) of the study population correctly differentiated between poisonous and nonpoisonous snakebites based on signs and symptoms of the victim. About 55.5% (75) of the total population could rightly point out the difference of snakebite marks from other bites [Table 2]. When asked about why snakebite, the villagers said that snakebite when they were touched (57.04%) or hit (33.33%). About 57.78% (78) of the population believed that snakebite can be managed by traditional faith healers (Ojha) [Figure 2].

About 40.7% (55) of the total population believed that snakebite can be managed at home [Table 2] and when all of them were interviewed about different types of home management for snakebite majority preferred tying a tourniquet/similar material over the bite mark (76%), washing with antiseptics (6%), tying the root of a of a tree and cutting bitten area (4%), and feeding neem leaves and sucking wound (2%) [Figure 3].

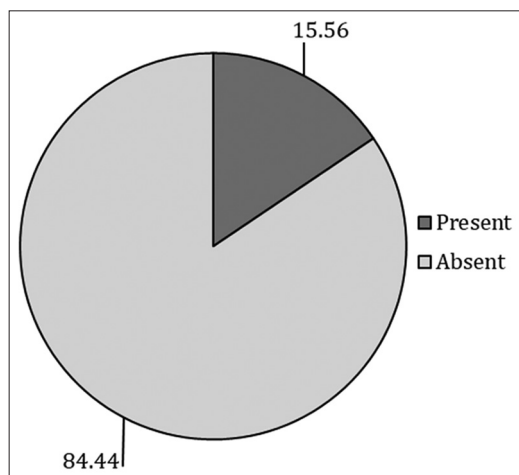


Figure 1: Distribution of study population according to the history of snakebite (n=135)

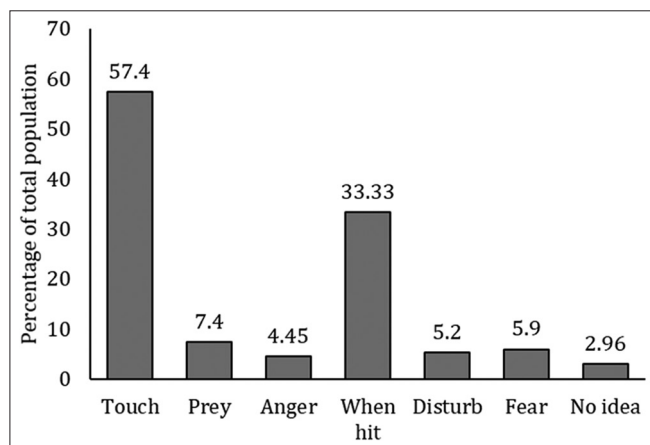


Figure 2: Distribution of study population according to their response to the question, “why do snakebite?” (n=135)

About 59.3% (80) population who were in favor of management outside the home – the majority (49%) preferred Manasha worship, followed by antivenom injection (34%) and floating the snakebite victim on velamen (5%), and catching the snake for species identification before initiation of treatment (4%) [Figure 4].

DISCUSSION

In the present study, the majority of the study population were in the age group of 30–60 years (69.5%), females (52.6%), and Hindu (74.8%). About 59.1% (100) of the population were educated up to primary level and more than 50% had reported to have per capita monthly income <Rs. 1000. Furthermore, 81.1% (110) of the study population correctly differentiated between poisonous and nonpoisonous snakebites based on signs and symptoms of the victim. About 55.5% (75) of the total population could rightly point out the difference of snakebite marks from other bites. When asked about why snakebite, the villagers said that snakebite when they were touched (57.04%) or hit (33.33%).

A study done previously in Sri Lanka by Silva *et al.*^[11] had the subjects where 56.8% of the population were males and 43.2% females with a mean age of 42 years, and majority were educated above Grade 12. Interestingly, 15.56% of the study population in our study gave a history

Table 2: Distribution of study population according to their knowledge about snakebite and its management (n=135)

Question on knowledge domain	Response	N (%)	
Can you differentiate between poisonous and non-poisonous snakebites from signs and symptoms?	Correct	110 (81.1)	
	Incorrect	25 (18.9)	
Which time of the day do snakebite?	Morning	2 (1.4)	
	Day	9 (6.6)	
	Night	55 (40.74)	
	Any time	49 (36.2)	
Can you identify snakebite marks from other bites?	Correct	75 (55.)	
	Incorrect	60 (44.5)	
Where do you think should the snakebite victims be managed?	At home	55 (40.7)	
	Outside home	80 (59.3)	
Who can treat snakebite?	Allopathy	53 (39.25)	
	Homeopathy	2 (1.48)	
	Ojha	78 (57.78)	
	No idea	2 (1.4)	
How do you transport snakebite victims?	Walking	33 (24.44)	
	Running	3 (2.2)	
	Vehicle	97 (71.85)	
	Bamboo stretcher	2 (1.4)	

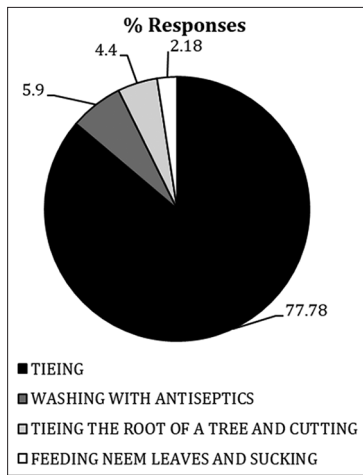


Figure 3: Distribution of study population according to their knowledge of home management of snakebite (n=55)

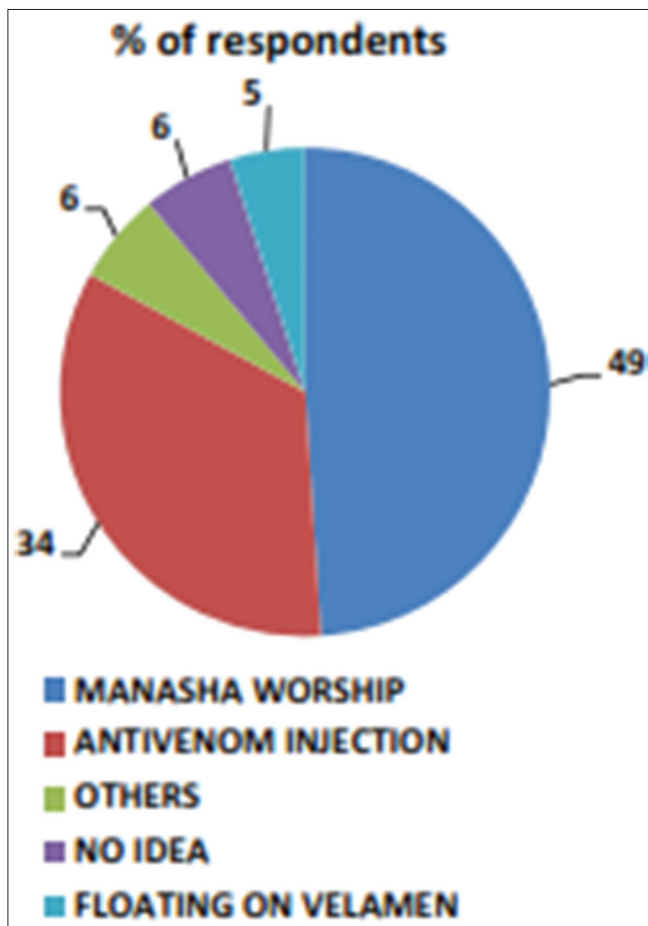


Figure 4: Distribution of study population according to their knowledge about the management of snakebite outside the home (n=80)

Others-Special chantings by ojha, rubbing venom stone over bite area, capturing the snake for species identification is essential for treating the victim.

of snakebite which is similar to the history of 17% among the farmers in the Sri Lanka study,^[11] both indicating the burden of snakebite for respective study areas. In a study

at Laos,^[12] 72.3% of the study population, had inadequate knowledge regarding poisonous and nonpoisonous snake identification. Knowledge in relation to the management of snakebite patients was inadequate for 54.6% participants.

Further, in our study 57.78% (78) of the population believed that snakebite can be managed by traditional faith healers (Ojha). Management of snakebite victims by snake charmers or faith healers (Ojhas) is a common practice in rural areas according to other studies.^[2,9,13,14] About 40.7% (55) of the total population in our study believed that snakebite can be managed at home and when all of them were interviewed about different types of home management for snakebite majority preferred tying a tourniquet/similar material over the bite mark (76%), washing with antiseptics (6%), tying the root of a of a tree and cutting bitten area (4%), and feeding neem leaves and sucking wound (2%). Similarly, in the study on Sri Lankan farmers,^[11] it was evident that a very high percentage of participants preferred the application of a tourniquet as a first aid measure following snakebite. The uneducated villagers being unaware of snakebite treatment continue to trust the traditional faith healers and their age-old techniques of applying a tight tourniquet, using herbal products, multiple incisions at the bite site, and other different rituals.^[4,9,14,15] Lack of awareness about first aid and management of snakebite cases among common people has led to the development of superstitions which dominates the treatment-seeking behavior of the people.^[14]

In our study, of 59.3% (80) population who were in favor of management outside home – the majority (49%) preferred Manasha worship, followed by antivenom injection (34%) and floating the snakebite victim on velamen (5%), and catching the snake for species identification before initiation of treatment (4%). Most participants in the Sri Lankan study^[11] believed the fact that snakebites could be successfully treated by allopathic doctors provided that the snake is captured for species identification. However, it is evident that most of the traditional methods of snakebite have been found to be the cause of delay and ultimately leading to deterioration and death of the victims.^[9,13]

While recommended first-aid methods emphasize on reassurance and immobilization of the patient, particularly the bitten limb, the use of a tourniquet is discouraged in the updated protocol.^[9,16] Anti-venom serum with other supportive measures such as hemodialysis, still continues to be the main treatment until date for a poisonous snakebite victim.^[4,6,9,16-18]

Since this study was a cross-sectional observational study, few limitations such as responder bias, recall bias, social desirability bias, and interviewer bias cannot be ruled out.

CONCLUSION

The burden of snakebite is greatest in the poor economic zones where survival is of no guarantee, and thousands of victims are left permanently disabled. Unfortunately, management of snakebite remains a challenge even in today's era of modern health-care facilities.^[9,16-18] Considering the poor socio-economic condition of the study population and their lack of education, it is quite evident that age old superstitions and misconceptions about snakes still exist among the villagers. In rural area people still believe in traditional faith healers (Ojha) for the management of snakebite along with tying a tourniquet as a first aid which has led to delay in initiating medical treatment and ultimately death or disability of the victims. It is essential to communicate about the appropriate first aid of a snakebite to the communities at risk of snakebite. Campaigning should be done to raise the awareness level of the common people about snakebite and its management so that people are encouraged to shift snakebite victims to health facilities where antivenoms are available.^[9,13,16-18]

To ensure early initiation of modern medical treatment, health care providers at all levels including local faith healers need to be trained in the management of snakebite cases as per existing protocol. They should also be motivated to coordinate with government hospitals and refer to snakebite victims as early as possible to avert further deterioration.

ACKNOWLEDGMENT

The author acknowledges Director, IPGMER for necessary administrative approvals and support.

REFERENCES

- World Health Organization. Rabies and Envenoming: A Neglected Public Health Issue. Geneva: World Health Organization; 2007. p. 1-38.
- Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, Jotkar RM, *et al.* Snakebite mortality in India: A nationally representative mortality survey. *PLoS Negl Trop Dis* 2011;5:e1018.
- Report on Causes of Death in India, 2001-2003. Government of India. New Delhi: Office of the Registrar General, Ministry of Home Affairs; 2005. p. 1.
- Ghosh MK. Management of snakebite cases by national treatment protocol at Jalpaiguri district hospital in West Bengal in the year 2010 a retrospective study. *J Indian Med Assoc* 2011;109:533-60.
- Simpson ID. Snakebite Management in Asia and Africa. A Guide to Snakebite in the key Areas for Mortality and Morbidity. Pakistan Medical Research Council; 2013.
- Kamal FB, Barry MB. Vascular injury in kidney disease. In: Kaspar DL, Fauci AS, Longo DL, Braunwald E, Hauser SL, Jameson JL, *et al.*, editors. *Harrison's Principles of Internal Medicine*. 17th ed. New York: McGraw-Hill; 2005.
- Sharma SK, Chappuis F. Impact of snake bites and determinants of fatal outcomes in south eastern Nepal. *Am J Trop Med Hyg* 2004;71:234-8.
- Cruz LS, Vargas R, Antonio AL. Snakebite envenomation and death in the developing world. *Ethn Dis* 2009;19:42-6.
- Warrell DA. Guidelines for the Management of Snake-bites. New Delhi: WHO Library Cataloguing-in-Publication Data; 2010.
- Chandio AM, Sandelo P, Rahu AA, Ahmed ST, Dahri AH, Bhatti R, *et al.* Snake bite: Treatment seeking behaviour among Sindh rural population. *JAMC* 2000;12:3-5.
- Silva A, Marikar F, Murugananthan A, Agampodi S. Awareness and perceptions on prevention, first aid and treatment of snakebites among Sri Lankan farmers: A knowledge practice mismatch? *J Occup Med Toxicol* 2014;9:20.
- Inthanomchanh V, Reyer JA. Assessment of knowledge about snakebite management amongst healthcare providers in the provincial and two district hospitals in Savannakhet province, Lao PDR. *Nagoya J Med Sci* 2017;79:299-311.
- Kasturiratne A, Wickremasinghe AR, de Silva N, Gunawardena NK, Pathmeswaran A. Estimating the global burden of snakebite: A literature analysis and modelling based on regional estimates of envenoming and deaths. *PLoS Med* 2008;5:e218.
- Gupta SM. *Plant Myths and Traditions in India*. Leiden, Netherland: E J Brill; 1971.
- Yanamandra U, Yanamandra S. Traditional first aid in a case of snake bite: More harm than good. *BMJ Case Rep* 2014;10:1136.
- Simpson ID. Snakebite management in India, the first few hours: A guide for primary care physicians. *J Indian Med Assoc* 2007;105:324-35.
- Mondal TK, Das M, Sarkar AP, Dudhe AP, Ghosh S. A clinico-epidemiological study on snake bite in a tertiary care hospital of West Bengal. *Int J Med Sci Public Health* 2017;6:266-9.
- Gupta R, Gupta BM, Gupta A. Drug usage in the management of snake bite patients in a tertiary care teaching hospital a retrospective study. *Int J Med Sci Public Health* 2018;7:954-8.

How to cite this article: Chaudhuri A, Siddalingaiah HS, Pal PP, Mondal MM, Misra R. Snakebite and its management in rural West Bengal: The unspoken truth. *Int J Med Sci Public Health* 2019;8(7):580-584.

Source of Support: Nil, **Conflict of Interest:** None declared.