

Health seeking behaviours of snakebite victims in rural areas of Rajasthan, India

V. Dhikav¹, A. Shandiliya¹, J. Saini²

¹Vector Biology Laboratory, ICMR-NIIRNCD, Jodhpur, Rajasthan, India

²All India Institute of Medical Sciences, Jodhpur, Rajasthan, India

ABSTRACT: Snakebite envenomation is a neglected tropical disease and India accounts for maximum mortalities related to snakebites. This could be due to typical health seeking behaviour, inadequately trained manpower at the primary care centres or misbeliefs in community that hinder timely treatments of snakebites. The current study reports a total of 76 bites (M:F=40:36) from rural Rajasthan in Western India (Mean age= 29±17 years). The majority of victims went to health care centres e.g., primary care centres (n=44/76=57.8%), including 14 victims who reported to community health centres (18.4%). Although the majority visited health care centres (76.2%) but a total of 23/44 victims (52%) approached faith healers before going to health facilities. A sizable number took consultations from place of worship as per their faith (n=15) and snake charmers (called as bhopa in local language; n=8). Snake charmers performed the dangerous act of sucking the blood from the victim's wound (n=5).

— **Keywords:** Snakebite, Health seeking, Primary health care.

INTRODUCTION

Snakebite is a potentially life-threatening disease¹. Snakes bite about 2-3 million Indians annually with >50,000 deaths, with highest snakebite burden in the world. Snakebite is more of a seasonal problem (e.g., rainy season) in the state of Rajasthan, as is so in India, with rural areas being predominantly affected. The peak incidence of snakebite is with the onset of the monsoons. Rajasthan which is the largest state by area in India is one of the states that report a high incidence of death due to venomous snakebite in the One Million Death study (1 MDS)¹. The current study was planned to assess various predictors and health seeking behaviour of snakebites in rural areas of Rajasthan.

SUBJECTS AND METHODS

A telephonic survey of the community living in various villages (n=76) was done from the data collected from the list of snakebites victims obtained from Integrated

Disease Surveillance Portal Unit, Udaipur (Rajasthan) during the study period (January-June 2021). Upon initial telephonic call, only patients belonging to rural areas were selected. Patients in the current study came from rural areas of various districts of Rajasthan such as *Pratapgarh, Dungarpur, Banswara and Chitorgarh*.

Telephonic call was given to them starting from the period January-June 2021. A semi-structured questionnaire was used to collect information about various predictors of snakebites and health seeking behaviours related to snakebite.

RESULTS

A total of 76 bites (M:F=40:36) were reported (Mean age= 29±17 years). A total of 23 bites were reported in children (30.2%) and there were a total of 8 elderly (60 years or more; 10.5%). A majority of 46/76 (60%) bites were noted in summers, the rest in winters (n=30). A total of 20% bites (n=15) were noted in twilight time while the majority of bites were reported in daytime



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/)

(n=61) during working in fields. Legs were most common site of bites (n=45; 59.2%); rest sites were hands (n=31; 40.7%).

The majority of them went to health care centres e.g., primary care centres (n=44; 57.8%), including 14 victims who reported to community health centres (18.4%). Private consultations (n=17) were mainly sought in paediatric age group (n=14; 18.4%). The majority of the victims visited health facilities within 6 hours (n=51; 67.1%).

Most of the times victims were working (n=62; 81.5%) at the time of bite (the rest were playing). A total of 31 patients (40.7%) had no idea of anti-snake venom, followed by 45 (59.2%) who knew about anti-snake venom ASV which was given to their victims. No one had any idea about the dose of ASV administered. No one knew of any adverse reactions that occurred due to ASV. A total of 46 had local reactions to snakebite (60.5%).

Although the majority visited health care centres (76.2%) but a total of 23/44 victims (52%) approached faith healers in current study before going to health facilities. A sizable number took consultations from place of worship as per their faith (20%) and snake charmers (called as *bhopa* in local language; n=8). Snake charmers performed the dangerous act of sucking the blood from the victim's wound (10%). They also performed bizarre acts of diagnosing the type of snakebite whether it is poisonous or not depending upon if taste of red chilli in the victim was present or not after bite. Likewise, chewing leaves of *azadirachta indica* (neem in local language) by the patient was considered indicative of poisonous snake if bitter taste was present (non-poisonous) or absent (poisonous). In addition tantric activities, magic tricks and rituals were also performed upon the victims in place of worship.

DISCUSSION

It has been reported in western literature that rural victims of snakebite rarely seek medical help from hospitals². A significant number of snakebite victims sought care from faith healers in the current study. Since doctors in primary care lack the confidence in treating the snakebites at the periphery³, it is suggested that training programs could be introduced for healthcare workers for snakebite management at primary care level⁴. To be able to reduce mortality, training in emergency management has been suggested in India⁵, while it is heartening to know that snakebite is no longer the neglected tropical disease, but challenges still remain in management of snakebite in primary care⁶⁻⁸. Every year, snakebites kill between 81,000 and 138,000 people in the world and cause long-lasting disabilities in another 400,000 people. This disease burden is likely to be an underestimate given snakebite is rarely notifiable, as many bites and deaths go unrecorded. It has been estimated that the burden of snakebite death and disability is equal to that of prostate or cervical cancer and it is greater than any other neglected tropical disease⁹. The current study has some limitations as this is a telephonic survey and relies upon the data taken by telephonic means. However, data were taken and verified

by medical doctor (Dr. JS) and MPH Intern (AS), both trained public health professionals.

Results in the current study are consistent with large Sri Lankan study⁸ (n=1,65,665) where both allopathic and traditional treatments were sought. In another study⁹, the issue of significant number of snakebite victims seeking snakebite treatment from alternative system of medicine has been raised. A similar study¹⁰ (n=1018) has highlighted the issue of native remedies and use of inappropriate first aid after snakebite treatment in Sri Lanka.

Most of the victims of snakebite at the time of biting were young adults or children, working in the field, and were bitten in twilight zone. Legs were the most common site of biting. A retrospective study¹¹ from Southern India reported the prevalence of mortality among snakebite victims was reported to be about 10%. One study¹¹ underscores early reporting of victims to healthcare facilities. Agricultural workers among others have been recognized to be high risk workers¹.

It is important to understand that snakebite envenoming is a frequently overlooked cause of mortality and morbidity due to lack of awareness¹². Additionally, delayed presentation to the hospital, and treatment by non-qualified personnel also add to the risk of mortality¹³.

It has been observed that inappropriate perception about snakebites, inadequate awareness, and knowledge about snakebites may predispose the rural community to increased risks of venomous snakebites. Unproven and harmful methods for snakebite treatment practiced by the community and traditional faith healers could be dangerous leading to high mortality¹⁴.

CONCLUSIONS

The current study highlights the importance of educating⁹ and creating awareness among rural people about the snakebites to modify health seeking behavior and health outcomes on one hand and emphasizes the need of training healthcare workers on the other hand for better handling of snakebite victims at primary care. There are some attempts in this direction as well. A large study¹⁵ covering around 3 million people used a combination of direct engagement and education *via* social media to generate awareness about snakebites in rural areas.

CONFLICT OF INTERESTS:

The authors declare that they have no conflict of interests.

REFERENCES

1. https://www.who.int/health-topics/snakebite#tab=tab_1 (Accessed online dated February 19th 2022).
2. Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, Jotkar RM, Rodriguez PS, Mishra K, Whitaker R, Jha P; Million Death Study Collaborators. Snakebite mortality in India: a nationally representative mortality survey. *PLoS Negl Trop Dis* 2011; 5: e1018.

3. Sapkota S, Pandey DP, Dhakal GP, Gurung DB. Knowledge of health workers on snakes and snakebite management and treatment seeking behavior of snakebite victims in Bhutan. *PLoS Negl Trop Dis* 2020; 14: e0008793.
4. Alcoba G, Chabloz M, Eyong J, Wanda F, Ochoa C, Comte E, Nkwescheu A, Chappuis F. Snakebite epidemiology and health-seeking behavior in Akonolinga health district, Cameroon: Cross-sectional study. *PLoS Negl Trop Dis* 2020; 14: e0008334.
5. Kshirsagar VY, Ahmed M, Colaco SM. Clinical profile of snake bite in children in rural India. *Iran J Pediatr* 2013; 23: 632-636.
6. Bawaskar HS, Bawaskar PH, Bawaskar PH. Primary health care for snakebite in India is inadequate. *Lancet* 2020; 395: 112.
7. The Lancet. Snakebite-emerging from the shadows of neglect. *Lancet* 2019; 393: 2175.
8. Ediriweera DS, Kasturiratne A, Pathmeswaran A, Gunawardena NK, Jayamanne SF, Laloo DG, de Silva HJ. Health seeking behavior following snakebites in Sri Lanka: Results of an island wide community based survey. *PLoS Negl Trop Dis* 2017; 11: e0006073.
9. Shahmy S, Kularatne SAM, Rathnayake SS, Dawson AH. A prospective cohort study of the effectiveness of the primary hospital management of all snakebites in Kurunegala district of Sri Lanka. *PLoS Negl Trop Dis* 2017; 11: e0005847.
10. Kularatne AM, Silva A, Maduwage K, Ratnayake I, Walathara C, Ratnayake C, Mendis S, Parangama R. Victims' response to snakebite and socio-epidemiological factors of 1018 snakebites in a tertiary care hospital in Sri Lanka. *Wilderness Environ Med* 2014; 25: 35-40.
11. Kalantri S, Singh A, Joshi R, Malamba S, Ho C, Ezoua J, Morgan M. Clinical predictors of in-hospital mortality in patients with snake bite: a retrospective study from a rural hospital in central India. *Trop Med Int Health* 2006; 11: 22-30.
12. Longbottom J, Shearer FM, Devine M, Alcoba G, Chappuis F, Weiss DJ, Ray SE, Ray N, Warrell DA, Ruiz de Castañeda R, Williams DJ, Hay SI, Pigott DM. Vulnerability to snakebite envenoming: a global mapping of hotspots. *Lancet* 2018; 392: 673-684.
13. Kumar KS, Narayanan S, Udayabhaskaran V, Thulaseedharan NK. Clinical and epidemiologic profile and predictors of outcome of poisonous snake bites - an analysis of 1,500 cases from a tertiary care center in Malabar, North Kerala, India. *Int J Gen Med* 2018; 11: 209-216.
14. Chaaithanya IK, Abnave D, Bawaskar H, Pachalkar U, Tarunkar S, Salvi N, Bhoje P, Yadav A, Mahale SD, Gajbhiye RK. Perceptions, awareness on snakebite envenoming among the tribal community and health care providers of Dahanu block, Palghar District in Maharashtra, India. *PLoS One* 2021; 16: e0255657.
15. Samuel SP, Chinnaraju S, Williams HF, Pichamuthu E, Subharao M, Vaiyapuri M, Arumugam S, Vaiyapuri R, Baksh MF, Patel K, Trim SA, Duncombe TE, Vaiyapuri S. Venomous snakebites: Rapid action saves lives-A multifaceted community education programme increases awareness about snakes and snakebites among the rural population of Tamil Nadu, India. *PLoS Negl Trop Dis* 2020; 14: e0008911.