

Sociodemographic Characteristics of Patients with Snakebite: An Observational Study

Ashok Kumar¹, Ravi Kumar Raman², Rajan Kumar³

¹Senior Resident, Department of Geriatric, Patna Medical College and Hospital, Patna, Bihar India

²Assistant Professor, Department of General Medicine, Patna Medical College and Hospital, Patna, Bihar India

³Associate Professor, Department of General Medicine, Patna Medical College and Hospital, Patna, Bihar India

Received: 05-12-2022 / Revised: 07-01-2023 / Accepted: 28-01-2023

Corresponding author: Dr. Ravi Kumar Raman

Conflict of interest: Nil

Abstract

Aim: The present study was conducted to understand the sociodemographic profile of fresh cases of snakebite in Bihar region.

Methods: It was an observational, prospective and cross-sectional study. The study was conducted at department of general medicine Patna medical college and Hospital, Patna, Bihar India. Hundred admitted cases of symptomatic snake bite in the Patna medical college and Hospital were selected for the study. The age range was 16 to 60 years. The study was conducted for the period of one year.

Results: The result shows that there were 30% patients belonged to the age range of 16 to 26 years. 25% patients belonged to the age range of 49 to 60 years. 20% patients belonged to the age range of 38 to 48 years. 25% patients belonged to age range of 27 to 37 years. It can be seen in that 73% cases were in the age range of 16-48. The descriptive analysis of the sociodemographic details shows that 60% patients were male and 40% were females. The result shows that 90% patients belonged to rural areas whereas only 10% patients belonged to urban areas. The result shows that 90% patients belonged to lower socioeconomic status and 10% patients belonged to middle socio-economic status.

Conclusion: The present study concluded that majority of the snakebite fresh cases belonged to male gender. Majority of cases fell in the age range of 16-48 years, majority of cases belonged to lower socioeconomic status and rural areas. The time of seeking treatment has reduced because of awareness about snake bite treatment and better transport facility.

Keywords: Snakebite, Lower Socioeconomic Status, Rural Areas.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Snake bite is a common life-threatening condition in many tropical countries; farmers, hunters, and rice pickers are at particular risk and prompt medical treatment is vital. [1] In India, the most

important species are cobras (*Naja*, *N. oxiana*, *N. kaouthia*), common krait (*Bungarus caeruleus*), Russell's viper (*Daboia russelii*), and *E. carintus*. [2] India is the largest single contributor to the global tally of snake bite deaths, with the

numbers ranging between 15,000 and 50,000 a year. Accurate statistics are not available and there is no standardized reporting of bites and identification of snakes. [3] Many victims are treated by various kinds of traditional healers. Small surveys have suggested an annual death rate of 1/10,000 in the early 20th century and 3.1/100,000 in the 1950s. [4]

Based on extensive, carefully planned community-based investigations, the exact extent of death and acute and chronic morbidity from snakebite is only now starting to be understood. Those who have survived snakebite may face social stigma if they have a persistent or permanent physical or psychological condition. Because of insufficient reporting in practically every area in the region, the full extent of human suffering is still unknown. It is strongly advised that all nations in the South-East Asia region designate snakebite as a distinct notifiable disease to address this shortcoming. Since it is primarily an occupational disease of food producers like farmers, plantation workers, herdsmen, and fishermen, as well as of wild life park rangers, military personnel, snake restaurant employees, snake handlers, and collectors of snake skins, snakebite is primarily a rural problem with significant implications for the nutrition and economy of the countries where it occur frequently. [5]

Due to the lack of reliable population-based studies on incidence and mortality, these estimations have large variability. [6-8] The WHO recently re-recognized snake bites as one of the neglected tropical illnesses due to the significant burden of mortality and morbidity caused by snake bites. [9,10] The majority of snakebites and consequent deaths worldwide occur in India. [6] India was estimated to have 46,000 snakebite deaths annually, with an age-standardized snakebite fatality rate of 4.1 per 100,000 people based on a major population-based countrywide survey

conducted over 15 years ago. The largest number of yearly snakebite deaths was reported in three states, including Bihar. [11]

It is always helpful to understand the socio-demographic profile of people suffering from any kind of disease. Hence, present study was conducted to understand the sociodemographic profile of fresh cases of snakebite in Bihar region.

Materials and Methods

It was an observational, prospective and cross-sectional study. The study was conducted at department of general medicine Patna medical college and Hospital, Patna, Bihar India. Hundred admitted cases of symptomatic snake bite in the Patna medical college and Hospital were selected for the study. The age range was 16 to 60 years. The study was conducted for the period of one year. All the confirmed new cases of snake-bite were selected for the study. The exclusion criteria were, patients less than age of 16 years, came to hospital after more than a week after the bites, having non-poisonous/asymptomatic snake bites and patients having previous history of end stage organic diseases as for example, ESRD, ESLD, chronic pulmonary diseases, cardiomyopathy, endocrinopathies, chronic pancreatitis, cerebrovascular accident, coagulation disorders etc.

Prior approval for this study was granted by the institutional ethics committee. The patients or their relatives were counselled and a willful, written informed consent was obtained. The demographic data of the 100 selected cases were recorded in pre-designed standard study forms by means of structured personal interview of patients and attendants. The data obtained were analysed by using SPSS-26. Descriptive statistics was used for the analysis purpose.

Results

Table 1: Demographic details

Variables	N%
Gender	
Male	60 (60)
Female	40 (40)
Age groups	
16-26	30 (30)
27-37	25 (25)
38-48	20 (20)
49-60	25 (25)
Locality	
Urban	90 (90)
Rural	10 (10)
Socio-economic status	
Lower	90 (90)
Middle	10 (10)

The result shows that there were 30% patients belonged to the age range of 16 to 26 years. 25% patients belonged to the age range of 27 to 37 years. 20% patients belonged to the age range of 38 to 48 years. 25% patients belonged to age range of 49 to 60 years. It can be seen in that 73% cases were in the age range of 16-48. The descriptive analysis of the

sociodemographic details shows that 60% patients were male and 40% were females. The result shows that 90% patients belonged to rural areas whereas only 10% patients belonged to urban areas. The result shows that 90% patients belonged to lower socioeconomic status and 10% patients belonged to middle socioeconomic status.

Table 2: The mean, median, mode, standard deviation and range of age in the sample

Age (Years)	Variables
Mean age \pm SD	37.35 \pm 13.123
Median	36
Mode	29
Minimum	18
Maximum	60

The mean age \pm standard deviation of age in the present study was 37.35 \pm 13.123 years. The mode is 29 years suggesting higher representation of this age among the patients under the present study. The minimum and maximum age of the patients with snake bite was 18 years and 60 years respectively.

Table 3:

Age range (Years)	Gender, n (%)	
	Male	Female
16-26	18	12
27-37	15	10
38-48	12	8
49-60	15	10
Total	60	40

It could be seen in the table that 18 male and 12 female fell in the age range of 16 to 26 years. 15 male and 10 female belonged to age range of 27-37 years. 12 male patients and 8 female patients fell in the age range of 38 to 48 years. It can be seen in the table that 15 male and 10 female patients belonged to the age range of 49 to 60 years.

Discussion

Snakebite is one of the neglected tropical diseases that World Health Organization (WHO) aimed to eradicate. [12] However, it has been excluded from WHO report of 2010 and 2013 on neglected tropical diseases. Currently, snakebite has been included along with other neglected non-tropical diseases such as strongyloidosis, scabies, mycetoma, etc. [12,13] The problem of snakebites has been persistently neglected by public health personnel, clinicians and policy makers even though its social and economic impact are wide-spread. [14]

It could be seen in the table that 18 male and 12 female fell in the age range of 16 to 26 years. 15 male and 10 female belonged to age range of 27-37 years. 12 male patients and 8 female patients fell in the age range of 38 to 48 years. It can be seen in the table that 15 male and 10 female patients belonged to the age range of 49 to 60 years. A study reported that 58% cases were women in 121 patients of snake bite in their study. [15] The finding of this study is not consistent with the finding of the present study. But there are other studies which has reported that 74.2% and 52.4% of their respective cases were males and 25.8 % and 52.4% of their respective cases were females in their study. [19-20] The gender distribution of the above-mentioned studies is similar to the gender distribution of the cases in the present study. These results indicate that males are more prone to snake bite than females. It can also be inferred from this result that young male (16-48 years) population are

vulnerable group for snake bite in Bihar region. It is also inferred that as most of the cases were young in age and fell victim to snake bite due to active participation in outdoor engagement. The females between 49-60 years of age were found to be vulnerable to snake bite more than female belonging to younger age. [16,17]

The mean age \pm standard deviation of age in the present study was 37.35 ± 13.123 years. The mode is 29 years suggesting higher representation of this age in the sample studied. The median of the age of the participants was 36 in the present study. A study found the median age to be 41.5 years in their study. [16-18] One another study reported mean age to be 42.8 years in the cases of snake bite. [17-19] The mean age and standard deviation reported in a different study on snake bite was found to be 42.2 ± 15 years. [15] These findings are consistent with the findings of the present study.

The ninety percent cases in the present study were from rural area which suggests that snake bite is a serious problem in rural area. Other studies conducted on snake bite in India have reported that majority of the cases in their studies were from rural area 18-19 which is similar to the finding of the present study. The sociodemographic analysis showed that 90% patients were belonging to lower socioeconomic status and 10% were belonging to middle socioeconomic status. It suggested that people from lower socio-economic background are more affected by snake bite problem. It is inferred that as people from lower socio-economic status are engaged in works more related to raw materials, fields, cultivation or any other primary sector of occupation. There are other studies which have obtained similar findings. [20,21] The result of the present study also showed that majority of the cases belonged to lower socioeconomic status and rural areas. [22] It can be inferred that young tribal people from rural part, who have a lower socio-economic

status, tend to be victims of snakebite as they mostly are engaged in primary sector work specially agriculture and cultivation. The working in agricultural and cultivation activity exposes them to forest and nearby areas, making them more susceptible to snakebite. Many studies have found that snake bites are a frequent occupational, environmental, and climatic risk in rural areas. Agricultural labourers frequently get their lower legs, ankles, and feet bitten and members of their families. [6-8]

Conclusion

The present study concluded that majority of the snakebite fresh cases belonged to male gender. Majority of cases fell in the age range of 16-48 years, majority of cases belonged to lower socioeconomic status and rural areas. The time of seeking treatment has reduced because of awareness about snake bite treatment and better transport facility.

References

1. Jones AL, Karalliedde L. Poisoning. In: Boon NA, Colledge NR, Walker BR, editors. Davidson's Principles and Practice of Medicine. 20th ed. Philadelphia: Churchill Livingstone Elsevier; 2006; 203–26.
2. Warrell DA, Cox TM, Benz EJ, Firth JD, editors. Oxford textbook of medicine. Oxford university press; 2003.
3. Bakshi SA. Snake bites in rural area of Maharashtra state, India. Tropical doctor. 1999;29(2):104-5.
4. Bambery P. Snake Bites and Arthropod Envenomation. In: Shah SN, editor. API Textbook of Medicine. 8th edn. Mumbai: The Association of Physicians of India Publication; 2008. pp. 1517–20.
5. Thakur V. Sociodemographic profile of patients with snakebite in Jharkhand. Int J Adv Med. 2022; 9:100 1-5.
6. Kasturiratne A, Wickremasinghe AR, de Silva N, Gunawardena NK, Pathmeswaran A, Premaratna R et al. The global burden of snakebite: a literature analysis and modelling based on regional estimates of envenoming and deaths. PLoS Med. 2008;5(11): e218.
7. World Health Organization. Prevalence of snakebite envenoming.: WHO. Available at: <http://www.who.int/snakebites/epidemiology/en/>. Accessed on 25 August, 2022.
8. Gutierrez JM, Warrell DA, Williams DJ, Jensen S, Brown N, Calvete JJ et al. The need for full integration of snakebite envenoming within a global strategy to combat the neglected tropical diseases: the way forward. PLoS Neglect Trop dis. 2013;7(6):e21 62.
9. Snake bite-the neglected tropical disease. Lancet (London, England). 2017;390(10089):2
10. Chippaux JP. Snakebite envenomation turns again into a neglected tropical disease. J Venomous Animals Toxins Including Trop Dis. 2017; 23:38.
11. Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, Jotkar RM, et al. Snakebite mortality in India: a nationally representative mortality survey. PLoS Neglect Trop Dis. 2011; 5(4):e1018.
12. World Health Organization. Sustaining the drive to overcome the global impact of neglected tropical diseases: second WHO report on neglected diseases. World Health Organization; 2013.
13. World Health Organization. Working to overcome the global impact of neglected tropical diseases: first WHO report on neglected tropical diseases. World Health Organization. 2010.
14. Bhaumik S. Snakebite: a forgotten problem. BMJ. 2013 Jan 31;346.
15. Sanjay Vikrant, Ajay Jaryal, Anupam Parashar. Clinicopathological spectrum of snake bite-induced acute kidney injury from India. World J Nephrol. 2017;6(3):150-61

16. Jarwani B, Jadav P, Madaiya M. Demographic, epidemiologic and clinical profile of snake bite cases, presented to Emergency Medicine department, Ahmedabad, Gujarat. *J Emerg Trauma Shock*. 2013;6(3):199-202.
17. Gajbhiye R, Khan S, Kokate P, Mashal I, Kharat S, Bodade S, Yadav A, Mahale S. Incidence & management practices of snakebite: A retrospective study at Sub-District Hospital, Dahanu, Maharashtra, India. *The Indian Journal of Medical Research*. 2019 Oct; 150 (4):412.
18. Mao YC, Liu PY, Chiang LC. *Bungarus multicinctus multicinctus* Snakebite in Taiwan. *Am J Trop Med Hygiene*. 2017;96(6):1497-504.
19. Jayawardana S, Arambepola C, Chang T, Gnanathanan A. Long-term health complications following snake envenoming. *J Multidiscip Healthcare*. 2018; 11:279-85.
20. Sharma SK, Chappuis F, Jha N, Bovier PA, Loutan L, Koirala S. Impact of snake bites and determinants of fatal outcomes in southeastern Nepal. *The American journal of tropical medicine and hygiene*. 2004 Aug 1;71(2):234-8.
21. Ariaratnam CA, Sheriff MR, Theakston RD, Warrell DA. Distinctive epidemiologic and clinical features of common krait (*Bungarus caeruleus*) bites in Sri Lanka. *The American journal of tropical medicine and hygiene*. 2008 Sep 1;79(3):458-62.
22. Khaleel H. Morgagni's diaphragmatic hernia with Large ASD secundum and sever PHT mimicking a severe congenital heart disease in a newborn and cause delayed diagnosis of Morgagni's diaphragmatic hernia. a case report. *Journal of Medical Research and Health Sciences*. 2022; 5(3): 1832–1837.