

Epidemiology and fatal outcomes of snakebite in the union territory of Dadra and Nagar Haveli

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Received: October 11, 2016; Accepted: May 01, 2017

ABSTRACT

Background: Snakebite is one of the most neglected public health issues in the tropical and subtropical countries; India, being one of them. It is a medical emergency requiring immediate medical attention issues in poor tribal communities living in the forest area. **Objectives:** The indigenous factors of any geographical region are unique, and it contributes to the incidence of the snakebite and the outcome. It is necessary to consider the indigenous factors in the preventive and curative policies. The study was conducted to understand the epidemiological, geographical, and demographical aspect of snakebite in the union territory (UT) of Dadra and Nagar Haveli. **Materials and Methods:** Information concerning incident of venomous snakebite on weekly basis from all government health-care providers as presumptive surveillance. Furthermore, the victim's demographic information, age, sex, addresses, biting site, and the outcome of the snakebite victims were recorded through Integrated Hospital Management System. **Result:** The crude incidence rate of snakebites was 21.65/10000, and annual age-standardized mortality rates per 100,000 were 1.1. The males were outnumbered on females. The male and female ratio was observed 1.4:1. **Conclusion:** The fatal outcomes of snakebite can be reduced in high risk area with implementation of a systematic behaviors change communication and mobilization of victims to the hospital, along with prompt administration of anti-snake venom serum.

KEY WORDS: Snakebite; Epidemiology; Fatal Outcomes

INTRODUCTION

Snakebite, a recent inclusion to the list of neglected tropical diseases drawn up by the World Health Organization, could be the most neglected of all tropical diseases in the 21st century. India has long been considered the nation with the highest snakebite incidence.^[1] It is a common medical emergency and an occupational hazard, more where farming is a major source of employment. Every year, 50,000 Indians die in 2,50,000 incidents of snakebite despite the fact that India is neither a

home for the largest number of venomous snakes in the world nor is there a shortage of anti-snake venom in the country.^[1] The main cause of this incidence of snakebite fatalities is that people try out all kinds of "bizarre remedies" initially, instead of going to the nearest hospital. The available data on the epidemiology of snakebite from the Indian subcontinent are sparse because most of the snakebites occur in illiterate, rural people who use traditional healers.^[1] Selected workers have indicated the epidemiology of snakebite in different parts of the country.^[1-2] Similarly, investigation has been done by few investigators in selected state, Delhi, Karnataka, Jammu, West Bengal, Kerala, Maharashtra, and Uttar Pradesh.^[3-11] The available literature indicates no published report is available on the venomous snakebite cases in the UT of Dadra and Nagar Haveli. This study was carried out to describe the epidemiology, demography, and the outcome of snakebites which were seen in the health provider unit of UT of Dadra and Nagar Haveli.

Access this article online	
Website: http://www.ijmsph.com	Quick Response code
DOI: 10.5455/ijmsph.2017.1058801052017	

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MATERIALS AND METHODS

The present study was conducted retrospectively for a period of 1 year during the year 2012 in UT of Dadra and Nagar Haveli (Latitude -20°2' 51" N to 20°21' 36" N, Longitude - 72°54'41"N to 73°13'13"N). The Medical and Health Department routinely collects information concerning incident of snakebite on weekly basis under Integrated Disease Surveillance Program from all health-care providers as presumptive surveillance. The medical officers follow the ICD-10 codes X20-X29 (contact with venomous animals and plants), X20 (venomous snakes). The inclusion criteria for the study included all confirmed cases of venomous snakebite to the mentioned all reporting units during the study period; the exclusion criteria included doubtful cases of snakebite in the study. The victim's demographic information, age, sex, addresses, biting site, and the outcome of the snake bite victims were recorded through Integrated Hospital Management System. The mortality was defined on the basis of the registered cause of death. We reviewed the health department's computerized records to identify snakebite information to avoid the duplication cases.

RESULTS

A total of 758 cases of venomous snakebite (439 hemotoxic and 319 neurotoxic) were reported during the study. A total of 143 (18.9%) cases reported from Primary Health Centers, 440 (58.1%) cases from Community Health Center and 175 (23%) cases from District Hospital. The crude incidence rate was 21.65/10000, and annual age-standardized mortality rates per 100,000 were 1.1. Most of the cases were males (57.7%) and the male to female ratio was 1.4:1 (Table 1). Out of 758 victims, 2.3% belonged to the age group of 0-5 years, 2.7% to the age group of 5-10 years, 8.1% to the age group of 11-15 years, 12.2% to the age group of 16-20 years, 14.9% to the age group of 21-25 years, 12.6% to the age group of 26-30 years, 11.7% to the age group of 31-35 years, 10.4% to the age group of 36-40 years, 8.6% to the age group of 40-45 years, 8.6% to the age group of 46-50 years, 3.6% to the age group of 51-55 years, and 4.5% to the age group of more than 55 years. The mean age of the male victim was 31.5 years (range 3-65 years) and that of the female victim was 30.8 years (range 1-65 years). Incidence of venomous snakebite was observed to be a resident problem in the UT of Dadra and Nagar Haveli. One hundred and thirty-five incidences (17.8%) of snakebite cases were recorded in the pre-monsoon period (1-20 weeks). During the monsoon period (21-40 weeks), four hundred and seventy-two incidences (62.3%) were recorded. In post-monsoon period (41-52 weeks), one hundred and fifty-one incidence were reported (19.9%). Incidence of snakebite was mainly reported during the monsoon with maximum incidence of snake bite, 172 (22.7%) were reported during the 26th-30th week followed by 31st week to 35th, 127 cases (16.8%) (Table 1).

Table 1: Detail of snakebite surveillance

Parameters	Value (%)
Age distribution	
Children (<15 years)	99 (13.1)
Adult (>15 years)	658 (86.9)
Gender distribution	
Male	437 (57.7)
Female	321 (42.3)
Seasonal variation	
Pre-monsoon	135 (17.8)
Monsoon	472 (62.3)
Post-monsoon	151 (19.9)
Type of toxicity	
Neurotoxic	319 (42.1)
Hemotoxic	439 (57.9)
Epidemiological aspect	
The crude incidence	21.65/10000
Annual age-standardized mortality rates	1.1/100,000
Geographical location	
Urban	89 (11.8)
Rural	669 (88.2)
Reporting unit	
PHCs	143 (18.9)
CHCs	440 (58.1)
District hospital	175 (23.0)

PHCs: Primary Health Centers, CHCs: Community Health Centers

Four patients died, due to acute respiratory distress syndrome, disseminated intravascular coagulation, and intracerebral hemorrhage, thus giving a mortality rate of 0.52%.

DISCUSSION

The UT of Dadra and Nagar Haveli has explored the crude annual incidence of snakebite which was 21.65/100,000 populations. Annual age-standardized mortality rates per 100,000 from snakebite varied between states, from 3.0 in Maharashtra to 6.2 in Andhra Pradesh. Thirteen states have high prevalence rate of an average of 4.5 compared to 1.8 in the rest of the country.^[1] A 3-10% variation in the mortality rates which were caused by snakebites was reported in various studies.^[1,4,6,8,10-13] In the present investigation, low mortality and annual age-standardized mortality in contrast of previous works was found. The cause of low mortality and annual age-standardized mortality may be mobilization and the prompt transport of the snakebite victims to the hospital, along with the prompt administration of anti-snake venom serum (ASVS). Snakebite may be termed as an occupational disease, as farmers, plantation workers, herdsmen, hunters, or workers on the development sites are mostly affected.^[14] Farmers are more prone to accidental contact with snakes while they work in the field barefooted.^[3,9] Most of the human

snakebites occur during the monsoon season (21st-40th week) because of the flooding of the habitats of the snakes and their prey. It is the life cycle of the natural prey of these reptiles that govern their contact with humans. The breeding habits of frogs closely follow the monsoons, and rats and mice are always in close proximity to human dwellings. Males are affected more often than the females, as they constitute the working majority who are actively engaged in farming and other outdoor activities. Our findings concurred with those of earlier studies.^[1,5,15-17] Men are the dominant earning members of the family, working outdoors, and sleeping in the farmyards during harvesting. This could probably be the main cause of the male preponderance which was seen in our study. In our study, predominantly the younger population was involved (20-40 years of age), probably due to their more ambulant nature. The mortality rate was also found to be very low due to better health facility, early administration of ASVS, and an excellent treatment facility.

CONCLUSION

The fatal outcomes of snakebite can be reduced in high risk area with implementation of a systematic behaviors change communication and mobilization of victims to the hospital, along with prompt administration of anti-snake venom serum.

ACKNOWLEDGMENT

We would like to thank the Mission Director (NRHM) UT of Dadra and Nagar Haveli Silvassa, and Integrated Disease Surveillance Programme for provide necessary support.

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How to cite this article: Khan V, Zala DB, Kakadiya M, Das VK. Epidemiology and fatal outcomes of snakebite in the union territory of Dadra and Nagar Haveli. *J Med Sci Public Health* 2017;6(7):1201-1203.

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