Original Article

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Snake Bite Poisoning in Tertiary Care Hospital of North Karnataka

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Abstract

Total 79 cases of snakebite poisoning were studied between 1st January 2013 to 31st December 2013. Males were 58 (73.41%) and females were 21 (26.59%). Maximum sufferers were agriculturists 51 (64.55%). 51 (64.55%) were married. 74 (93.68%) victims of snake bite were Hindus. 67 (84.8%) cases belong to rural population. 51 (64.5%) cases shown the most common site of bite is lower limb. 18 cases (22.8%) were elapidae bites and 14 cases (17.7%) were viperidae bites among poisonous snakes. 37 cases (46.8%) were non poisonous bites. Maximum 39 cases (49.3%) were reported from July to September. 69 cases (87.3%) discharged after successful treatment where as 10 (12.7%) cases expired.

Keywords: Snake bite; Poisonous snakes; Lower limb bite.

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Introduction

Snake bite still stands a major cause of mortality and morbidity in resource limited counties like India [4]. Snake bite is a public health problem distributed mainly in the tropical and sub-tropical countries. India is one of the high prevalence countries [1]. Snake bite was included in the list of neglected tropical diseases by World Health Organization in the year 2009 [2,3]. An authentic measure of the global burden of snakebite envenoming remains obscure despite several attempts to estimate it and, apart from a few countries, reliable figures on incidence, morbidity, and mortality remains elusive. Globally every year, an estimated more than 5 million people are bitten by snakes [6,7]. Though no clear cut data is available due to poor reporting system and poor maintenance of hospital data in India, 35,000-50,000 people die every year in this country due to snake bite [5]. Seasonal peaks in the incidence of snake bite are associated with agricultural activities such as ploughing or to fluctuations in the activity or populations of venomous snakes. Severe flooding by concentrating the human and snake populations has given rise to epidemics of snake bite in Columbia, Pakistan, India Bangladesh and Vietnam. Penetration of jungle areas during construction of new highways, and irrigation and hydroelectric schemes may also be other cause [8].

India is inhabited by more than 60 species of venomous snakes of which only four have been popularly known to be dangerously poisonous to man; Spectacled cobra (Naja naja), common krait (Bungarus caeruleus), saw-scaled viper (Echis

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carinatus) and Russell's viper (Daboia russelii) [9]. The most common poisonous snake among them is common krait [10].

Aims and objectives

1. To assess the epidemiologic burden of snake bite including the incidence, mortality, population at risk.
2. In order to provide recent and useful data to improve the management of snake bite in this region.

Materials and Methods

This is a prospective study conducted carried out from 1st January 2013 to 31st December 2013 in department of Forensic Medicine and Toxicology of BLDEU`S Shri B. M. Patil Medical College Vijayapura, Karnataka. All the patients attending the casualty and emergency department with history of snake bite were included in the study. Scorpion bites and other bites and cases without definitive history were carefully excluded from the study. Preliminary data of each subject were entered in proforma at the time of admission. Preliminary data includes age sex, occupation educational status domicile marital status, time of bite, site of bite, signs and symptoms at the time of admission and treatment given were noted down. Results were expressed as frequency percentages. Ethical clearance was obtained from institutional ethical committee before the start of study.

Results

Table 1: Age and sex distribution of victims

Age	Male	Female	Total
Less than 10	01	00	01
10-19	04	01	05
20-29	18	09	27
30-39	19	04	23
40-49	13	02	15
50-59	02	02	04
More than 60	01	03	04
	58 (73.41%)	21 (26.59%)	79 (100%)

Table 2: Occupation status of the victims

Occupation	Male	Female	Total
Agriculture	43	08	51 (64.55%)
Student	07	01	08 (10.12%)
Housewife	00	11	11 (13.92%)
Unemployed	08	01	09 (11.39)

Table 3: Marital status of victims

Marital status	Male	Female	Total
Married	39	15	51 (64.55%)
Unmarried	19	06	25 (31.64%)

Table 4: Distribution according to religion

Religion	Male	Female	Total
Hindu	54	20	74 (93.68%)
Muslim	04	01	05 (6.32%)

Table 5: Domiciliary status of victims

Domicile	Male	Female	Total
Urban	09 (11.4%)	03 (3.8%)	12 (15.2%)
Rural	49 (62%)	18 (22.8%)	67 (84.8%)

Table 6: Site of snake bite

Site of bite	Male	Female	Total
Lower limbs	40 (50.8%)	11 (13.9%)	51 (64.5%)
Upper limbs	16 (20.2%)	06 (7.6%)	22 (27.8%)
Other sites	02 (2.5%)	04 (5.1%)	06 (7.7%)

Table 7: Type of snakes involved

Type of snake	No of cases
Poisonous	
Elapidae	18 (22.8%)
Viperidae	14 (17.7%)
Non poisonous	37 (46.8%)
Unidentified	10 (12.7%)
Total	79

Table 8: Time interval for hospital admission and bite

Interval	No of cases
0-6 hr	25 (31.6%)
7-12 hr	31 (39.2%)
13-18 hr	17 (21.5%)
>18 hr	06

Table 9: Monthly distribution of cases

Season	No of cases
Jan – mar	11 (13.9%)
April - June	13 (16.5%)
July - Sept	39 (49.3%)
Oct - Dec	16 (20.3%)

Table 10: No of cases who received anti snake venom

ASV	No of cases
Given	42 (53.2%)
Not given	37 (46.8 %)

Table 11: No of cases expired.

Final outcome	No of cases
Cured	69 (87.3%)
Expired	10 (12.7%)

Discussion

In poor rural communities living in the tropics snake bite is one of the most overlooked upon public health issue. The true global burden of snake bite is unknown due to serious misreporting/ non-reporting of the cases. South Asia has high population density and the people are indulged in widespread agricultural activities. A large number of venomous snake species are found in this region and there is a serious lack of efficient snake bite control programs. That is why it is the world's most affected region in regard to this problem.

Alirol Emilie et al. in their study in South Asia found out that the mean age of snake bite victims is around 30 years and three-quarters of the victims are in the 10- to 40-year age group. They also found a clear preponderance of males among snake bite victims. A 2:1 male to female ratio was observed [11].

Similarly, in our study too we found clear preponderance of males among snake bite victims with the male victims being thrice more than the female gender. Also, More than three-fourth of the victims come under 20-49 year age group. 30-39 year age group had the most male victims followed by 20-29 and then by 40-49 year age group. Deviating a little from these statistics the women victims had the majority in 20-29 age group followed by the 30-39 year age group. This might be because the male counterparts are more involved in the agricultural activities in the region. Also the decline in female victims in age group 30-39 and then more in age group 40 onwards might be because of marriage and household responsibilities that are taken up by women in the region predominantly.

Pandey DP in his study in Nepal found that farmers account for more than half of the victims in snakebite cases. Students and housewives are also frequently bitten [12].

Our study too was in concordance to that and found that more than half the victims were farmers followed by housewives and then students. Male victims were found to be more than four times the female ones. This might be because the males predominantly work in fields especially after dark and they are aided by their wives, if married in terms of providing them food and help in them with the agricultural activities also.

Our study also shows that married men were double the number of victims in comparison to unmarried men. This might be because of married men doing regular work in fields to get food for the family and also the unmarried youth is more indulged in studies keeping them away from the prone areas. Married women were thrice the victim compared to the unmarried ones.

Our study also showed that Hindu men were 10-14 times more the victim of snake victims compared to Muslim men while Hindu women were 20 times more the victim compared to their Muslim counterparts. This must be because traditionally Hindu men and women have been practicing agriculture in India while Muslim community is more tilted towards opening shops and doing business be it on small scale.

Further our study shows that rural population is more prone to snake biting cases. The ratio is 1:5 for urban: rural (males) and 1:6 urban: rural (females). This is because rural households and people are predominantly indulged in agriculture and fields which are more prone to be habitat to the snakes. While the urban households are situated away from fields and forests they are less prone while the rural huts and houses are situated in proximity to fields and also have kaccha foundation. Also rural people have a habit of sleeping on ground/floor which makes them prone to snake bites. Many a times the bites occur at night while the victims are asleep on the floor [13,14].

Pandey DP in his study in Nepal found that extremity bites accounted for 94%, with 66% in the lower extremities and 28% in the upper extremities [12].

Hansdak et al. in concordance with the above study found that Sixty per cent of the bites were in the lower limb (Nepal) [15].

Similarly in Sri Lanka, Ariaratnam et al. found that 82% of krait victims were bitten on their lower limbs [14].

We too in our study found similar results showing that about sixty percent of the bites were on lower limbs. Rest all were on upper limbs bar few. Bite on the head & trunk happens mostly due to the nocturnal species biting sleeping people.

In a study Bhalla et al. studied 150 patients in their hospital. Out of 150, 76 patients were of poisonous snake bite and 74 patients were of non-poisonous snake bite. Out of these 76 poisonous snake bites, 42 were viperine snake bites, 21 were neuroparalytic snake bites and 13 were locally toxic (LT) snake bites [16].

In a study done by De Silva he found that Russell's viper was responsible for 30.3% of bites with a mortality of 29.6%. Corresponding figures

for the other species were: common krait 14.8% and 33.9%, cobra (Elapidae) 17.2% and 35.4%, hump-nosed viper (Viperidae) 22.2% and 0%. Other bites were caused by mildly venomous Boiga species, Trimeresurus *trigono-cephalus* and non-venomous snakes [17].

Similarly in our study we found that poisonous cases were 18 (Elapidae) + 14 (Viperidae). 37 cases were found to be of non poisonous bites and 10 were not identified.

The bite-to-treatment delay varies greatly, ranging from 30 minutes to 15 days. Most studies show that at least 60% of victims reach a health centre within six hours but very few in less than one hour [11]. 90% of cases are presented to the hospital within 3 hrs of being bitten [15].

Our study shows that most of the cases were brought in the window period of 7-12 hrs closely followed by the 0-6 hr window. The earlier the case is brought for care more are the chances of the survival of the victim. The snake bite is treated by giving ASV to counter the venom, if any, envenomated by the snake (if poisonous). In our study it should be noted that during the care ASV was given to 42 cases and not given to 37 cases. The latter was because the bites were of non-poisonous snakes and didn't require any ASV. Poor access to health care services, difficult transportation and consequent delay in ASV administration result in high fatality. The time elapsed after the bite is of vital importance, because with the passage of time more venom gets bound to the tissues and is thus less manageable for neutralization by ASV [18].

Snakebites show a classical seasonal variation, being more common in summers and in the rainy season, when it is associated with agricultural activities [19]. Most frequently in September through November [14].

In our study we noted that July-Sept window period was the one where most cases occurred followed by April-June and Jan-March.

Conclusion

It is evidenced by this study that agriculturists are most affected population. So the people who engaged in agriculture work should be advised to wear shoes while working in the field as the most common site of bite is lower limb. Dominance with male population as sufferers is found. The time lapse between the snakebite and treatment seems to be the major concern. The people should be educated to visit the doctor at the earliest which may help to reduce the mortality to the greater extent. The incidence of snake bite found to be more in rainy season. The care should be taken to keep premises clean and avoiding working or playing in dark. The government also should take initiatives to educate the vulnerable population as to how to avoid bites and immediate measures to be taken after the snakebite.

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