Original Research

A clinico-epidemiological study on snake bite in a tertiary care hospital of West Bengal

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Abstract

Background: Snake bite has been described as one of the neglected tropical diseases by World Health Organization. Deaths due to snake bite per 100,000 population varied from 5.28 to 31.75 over 10 years in West Bengal.

Objectives: (i) To describe the socio-demographic profile of the snake bite cases admitted in a tertiary care level hospital, (ii) to assess the clinical profile of the cases, and (iii) to find out factors affecting the outcome of those cases.

Material and methods: It was a hospital-based observational study with longitudinal design conducted in the both male and female Medicine ward of Burdwan Medical College and Hospital, Burdwan. Data were collected with the help of pretested, predesigned schedule through interview of patients/patient party and hospital records. Data analysis was carried out with the help of SPSS version 22.0.

Results: Majority of patients were Hindus, general caste from rural areas. Majority were bitten by poisonous snakes (84.6%). Cure rate was associated with age, residence, literacy rate, occupation, distance from hospital, delay in care seeking, and type of snake.

Conclusion: Increase of literacy status along with intensive IEC on first aid and care seeking of snake bite may help in improving the situation.

KEY WORDS: Clinico-epidemiological study, snake bite, tertiary care hospital

Introduction

Snake bite has been described as one of the neglected tropical diseases by World Health Organization and it could be the most neglected of all tropical diseases in the 21st century.[1] It is mainly a problem of tropical and subtropical countries. India is one of the worst affected countries.[2] "Million Death Study" carried out by the Registrar General of India revealed that the expected deaths nationally are 45,900 with a rate of 4.1/100,000 population annually.[3]

Out of 216 species of snakes identifiable in India, 52 are known to be poisonous. The major families of poisonous snakes in India are Elapidae which includes common cobra (*Najanaja*), king cobra and common krait (*bungaruscaerulus*), viperidae includes *Russell's viper*, *echiscarinatus* (saw scaled or carpet viper) and pit viper and hydrophidae (sea snakes).[4] Although deaths due to bite of non-poisonous snakes may occur due to fear. Deaths due to snake bite per 100,000 population varied from 5.28 to 31.75 (average 16.4) over 10 years in West Bengal.[5] Snake bite cases still seek care from the "Ojhas" and attend the hospital at critical stage.

With this background the study was conducted with the objectives (i) to describe the socio-demographic profile of the snake bite cases admitted in a tertiary care level hospital,

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(ii) to assess the clinical profile of the cases, and (iii) to find out factors affecting the outcome of those cases.

Material and Methods

It was a hospital-based observational study with longitudinal design. The study was conducted in the both male and female Medicine ward of Burdwan Medical College and Hospital, Burdwan. Burdwan town is located about 100 km away from Kolkata. The study period was from March 2015 to November 2015, i.e., 9 months. Permission from the Institutional Ethics Committee of Burdwan Medical College and the Medical Superintendent cum Vice Principal of Burdwan Medical College and Hospital was obtained. All the 208 snake bite cases admitted during the study period were included in the study by complete enumeration. Patients or the patient party (in case of moribund cases) was informed about the study and informed consent was obtained prior to data collection. Data collection was done with the help of a pre-tested pre-designed schedule and hospital records. The study techniques used were interview of the patients or the patient party and review of hospital records. Patients were followed up daily from the time of admission until discharge, referral or death. The data were entered in a MS Excel spreadsheet and checked for accuracy. Data were analyzed using mean and proportion. Chi-square test was used as test of significance with the help of statistical software SPSS 22.0. The *p*-value of < 0.05 was considered as significant.

Results

This study revealed that majority of the patients were males (79.8%) from rural areas (85.1%), Hindus (79.3%), and of general caste (54.3%). Mean age of the patients was 27.82 ± 9.68 years (range 10–72 years). Patients aged 20–39 years contributed to 53.8%. Majority of them were educated up to middle school level (55.3%). Nearly half of the patients were agricultural labors. In majority of the cases the patients came from more than 10 km distance (64.9%). Most of the cases occurred between 6 PM and 6 AM (61.1%). About 15% patients visited Ojhas first for treatment. Delay in attending hospital was 2 hours to less than 5 hours in majority of the patients (55.3%). Even in 11.15% of patients local treatment was applied after the bite. Tourniquet and Inj. Tetanus toxoid were almost universal practice. But immobilization was applied in only 6.3% cases. Most of the patients were bitten by poisonous snakes (84.6%). Local burning sensation, pain, and edema were the most commonly found symptoms in the patients. RBC was found in 71.6% of cases. About 90% of cases were treated with anti-venom serum. Almost 80% of the patients were cured.

Then bivariate analysis was performed. Cure rate was declined with age and it was statistically significant ($p < 0.05$) (Table 1). Cure rate of males was more than females but it was not statistically significant. Majority of urban patients were cured (93.5%) which was statistically significant. Literates had more cure rate while agricultural labors had least, both were significant statistically.

In case of snake bite during day time the cure rate was more but not significant (Table 2). Patients living within 2 km distance from hospital/health center had maximum cure rate which was statistically significant. In case of bite by non-poisonous snake, cure rate was 100% which was statistically significant.

Delay in attending health facility affected cure rate which was statistically significant (Table 3). Local treatment at the site of bite, immobilization and administration of anti-venom serum although found to affect cure rate but not found to be statistically significant. On the other hand, seeking of care first at health facility had cure rate more and significant. Application of tourniquet lowered the cure rate and was statistically significant.

Discussion

This hospital-based longitudinal study revealed many features of snake bite. Mean age of the patients in present study is similar to a study conducted at Multan, Pakistan.[6] Males were affected more in many other studies in North India, Bangalore, Nepal, and Pakistan.[7–10] This may be due to more outdoor activities of males. Majority of the victims were from rural areas corroborating with the findings of studies conducted in India and abroad.[7,8] This may be due to availability of habitat for snakes in rural areas. Occupation of most of the victims of snake bite was agricultural labor which was also reported by study in North India.[7] This may be due to more chance of exposure to snakes. More snake bite occurred in evening or night probably because of more chance of bite in the dark.

Proportion of patients seeking treatment for first time from traditional healers was more found in a study in Pakistan.[11] But still 15% practiced this which indicates need for more IEC in this regard. Time of attending the hospital after snake bite was less than found in Maharashtra and Himachal Pradesh.[12,13] Application of local treatment was less than reported in Pakistan study.[11] Tourniquet application was more than Pakistan study but similar to Bangalore study which reflects the age old idea of first aid in snake bite.[11,8] Signs and symptoms after snake bite corroborated with other studies.[8,9,13] Cure rate was more in study by Harshabardhana et al.[12] Death rate was less than that found in Himachal Pradesh.[12]

More cure rate in males may be due to earlier care seeking due to gender bias. Because of close proximity of hospitals probably urban patients were cured more. Educational

Table 1: Distribution of patients according to socio-demographic variables and outcome of treatment of snake bite (*n* = 208)

Variable	Outcome		Total	χ^2, d.f.	*p*-Value
	Cured No. (%)	Not cured No. (%)			
Age (in years)					
10–19	23 (88.5)	3 (11.5)	26		
20–39	122 (81.7)	27 (18.3)	149	6.96, 2	0.03
≥40	21(72.7)	12 (27.3)	33		
Sex					
Male	137 (82.5)	29 (17.5)	166	3.78, 1	0.05
Female	29 (69.0)	13 (31.0)	42		
Residence					
Rural	137 (77.4)	40 (22.6)	177	4.26, 1	0.03
Urban	29 (93.5)	2 (6.5)	31		
Literacy status					
Illiterate	25 (50.0)	25 (50.0)	50	36.29, 1	0.00
Literate	141 (89.2)	17 (10.80)	158		0.00
Occupation					
Agricultural labor	68 (66.7)	34 (33.3)	102	29.94, 2	0.00
Home maker	18 (72.0)	7 (28.0)	25		
Others	80 (98.8)	1 (1.2)	81		

Table 2: Distribution of patients according to features of snake bite and treatment outcome (*n* = 208)

Variable	Outcome		Total	χ^2, d.f.	*p*-Value
	Cured No. (%)	Not cured No. (%)			
Time of bite					
6 AM–6 PM	73 (90.1)	8 (9.9)	81	8.76, 1	0.06
6 PM–6 AM	93 (73.2)	34 (26.8)	127		
Distance of hospital/ health center					
< 2 km	33 (100.0)	0 (0.00)	33	10.43, 2	0.005
2–5 km	32 (80.0)	8 (20.0)	40		
> 5 km	101 (74.8)	34 (25.2)	135		
Type of snake					
Poisonous	134 (76.1)	42 (23.9)	176	9.56, 1	0.02
Non-poisonous	32 (100.0)	0 (0.0)	32		

status played a role for cure probably by early care seeking. Delay in attending health facility naturally affected the prognosis. First care seeking at health facilities obviously increased the cure rate by proper treatment.

The strength of the study was that it was longitudinal in nature. The limitation of the study was that it was a hospital-based study.

Conclusion

This study in a tertiary care hospital revealed many factors for snake bite as well as its cure. Increase of literacy status along with intensive IEC on first aid and care seeking of snake bite would pave the way of curbing the problem of this neglected tropical disease.

Table 3: Distribution of patients according to treatment-related variables and outcome of treatment of snake bite (n = 208)

Variable	Outcome		Total	χ^2, d.f.	*p*-Value
	Cured No. (%)	Not cured No. (%)			
Delay (in hours)					
< 2	72 (94.7)	4 (5.3)	76	51.3, 1	0.00
2–5	91 (79.1)	24 (20.9)	115		
> 5	3 (17.6)	14 (82.4)	17		
Local treatment					
Given	143 (77.2)	42 (22.8)	185	0.01, 1	0.91
Not given	18 (78.2)	5 (21.8)	23		
First care seeking					
Ojhas (traditional healers)	18 (58.1)	13 (41.9)	31	10.68,1	0.001
Health facility	148 (83.6)	29 (16.4)	177		
Immobilization					
Done	13 (100.0)	0 (0.0)	13	3.5, 1	0.061
Not done	153 (78.5)	42 (21.5)			
Tourniquet					
Applied	138 (66.3)	40 (33.7)	178	3.98,1	0.04
Not applied	28 (93.3)	2 (6.7)	30		
Anti-venom serum					
Given	128 (78.5)	35 (21.5)	163	0.76, 1	0.38
Not given	38 (84.4)	7 (15.6)			

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