



Epidemiology of Cobra bite In Bhagalpur & surrounding area

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ABSTRACT Envenomation by poisonous snakes is considered as an occupational hazard. Cobra bite is commonly encountered in the South Asian countries. The prospective research was conducted in the Department of medicine and pediatrics, Jawaharlal Nehru medical college, Bhagalpur to study the epidemiology, manifestations and treatment of cobra snakebite cases admitted to College Hospital, Bhagalpur during August 2015 and November 2016. Twenty cases of cobra bite were reported during the study period. The victims of cobra bite predominantly were females. Mean age of victims was 41.9 years. Maximum cases occurred during the summer and pre-monsoon months, during daytime and involved the upper limbs. Ptosis was the chief neurotoxic feature followed by dysarthria. Cellulitis as a complication was observed in most of the cases. Polyvalent Anti Snake Venom (ASV) vials were used as specific treatment. No mortality was reported during the study period.

KEYWORDS : Snakebite; Cobra; Epidemiology; Bhagalpur, eastern India

Introduction:

World population of snakes is comprised of about 2,800 species of which 375 are venomous. Of this vast number of faunal spectrum of snakes only 242 species of snakes have been known from the Indian region of which only 57 species are poisonous or harmful [1]. Poisonous snakebites are a serious health challenge in tropical regions due to their incidence, morbidity and mortality [2]. More than 200,000 cases of snake bite are reported in India each year. Envenomation by poisonous snakes is an occupational hazard for the farmers and farm laborers, plantation workers, herders and hunters in tropical and subtropical countries [3-12]. The actual incidence of snake bites may be much higher as majority of cases occurring in rural population go unreported

The four common venomous land snakes which are found in this region include the Common cobra (*Naja naja*), the Common krait (*Bangarus caeruleus*), the Russell's viper (*Vipera russelli*) and the Saw scaled viper (*Echis carinatus*) [12, 13]. The principal effects of envenomation are on the nervous system, kidneys, heart, blood coagulability, vascular endothelium, and locally at the site of bite. [11, 12, 14] Envenomation due to cobra and krait bites causes paralysis of the ocular, bulbar, and limb girdle muscles where as viper bites mainly cause bleeding from muco-cutaneous sites, hemolysis, acute renal failure, and occasionally shock. [14] Although venomous snake bite is a life threatening emergency, it is rarely considered as a priority for health research in developing countries like India. This hospital based prospective research is aimed to study the clinico-epidemiological features of cobra bite envenomation.

Material and Methods:

The prospective research was conducted in the Department of Medicine and pediatrics, Jawahar Lal Nehru Medical college and hospital, bhagalpur during August-2015 and November-2016. Bhagalpur is a rural township located in the Bhagalpur district of Bihar. Bhagalpur and its adjoining districts comprise of forests and agricultural areas. JLNMC is a tertiary care center and teaching hospital of JLNMC, and the main referral center for cases of snakebite in the region

All the patients admitted to JLNMC with history of snakebite were followed up from the time of admission throughout their stay in hospital. Snakes were identified based on the description given by the patients/ relatives/ bystanders and by correlating the clinical manifestations. All cases of cobra bite (n=20) were included in the study. Case details including age, sex and occupation of the victims, the site of bite, time of bite, delay in admission to the hospital, clinical manifestations, specific treatment, complications and outcome were obtained from patients, their relatives and hospital records. The demographic and clinical details of each patient were registered and analysed using Statistical Package for Social Sciences (SPSS) version 10.0 and a clinico-epidemiological profile was made

Results:

During the study period 20 cases of confirmed cobra snake-bite were

admitted to JLNMC. Maximum number of victims were females (n=12, 60%), male-female ratio being 1: 1.5. The victims were aged between 12 years and 70 years. Mean age of victims was 41.9 years (40.6 years in males and 42.8 years in females). Age distribution of the victims in decades was observed to be uniform. Most of the victims in our study were bitten during the day time (n=16, 80.0%) and in outdoors settings (n=11, 55.0%). Upper limbs were involved in maximum number of cases (n=11, 55.0%) followed by lower limbs (n=8, 40.0%) and trunk (n=1, 5.0%). Most of the patients (n=16, 80.0%) were involved in farming related activities. Definitive fang marks were observed in 19 patients of cobra bite. Double punctured (fang) marks were present in the majority of cases (n=14, 70.0%). Detailed victim profile of cobra bite cases is presented in Table 1. Half of the cobra bite cases were reported during April and August. Monthly distribution of cases.

Most of the patients were brought to the hospital within the first twelve hours of cobra bite (n=18, 90.0%). Fifty five percent received first aid measures prior to hospitalization. Local and/ or systemic signs of envenomation were evident in ninety five percent victims. A case where fang marks could not be appreciated showed signs of envenomation while one case with scratches did not show any signs of envenomation. Local pain and swelling, vomiting, confusion, and difficulty in breathing were the presenting complaints at the time of admission. Systemic manifestations observed in cases of cobra bite included blurring of vision, ptosis, ophthalmoplegia, dysarthria, muscular weakness and respiratory embarrassment (Figure 4). Ptosis was the chief neurotoxic feature followed by dysarthria. Cellulitis as a complication was observed in 15 cases. As a specific treatment, a number of polyvalent Anti Snake Venom (ASV) vials were used during treatment. The number ASV vials administered to each patient of cobra bite ranged from 0 to 26 vials, at an average of 12.4 ASV vials per patient. No fatalities were reported from cobra bites during the study period. Seventeen victims completely recovered in the hospital while the other three left the hospital against medical advice. Victim details of hospitalization and clinical manifestations in cobra bite cases are presented in Table 2

Discussion:

Age distribution of the victims of snakebite in our study was fairly uniform after the first decade. The more ambulant population involved in farming is at increased risk of snakebite. Age group of thirty to fifty years with a peak incidence of the victims in their third decade has been observed in the earlier studies in India and SEAR [15-19]. Mean age of victims in our study was comparatively higher than that reported in earlier studies. A male preponderance among snake bite victims with a male to female ratio 2:1 is frequently observed [15]. In our study snakebite victims were predominantly females. In India, female preponderance in Himachal Pradesh [13] and Maharashtra [20] and a male preponderance in Davangere [12], Jammu [21] and Haryana [22] is reported. Most of the victims were involved in farming related activities. Farming community is increasingly prone for accidental contact with the snakes while working in the fields. The maximum victims of snakebite in our study are reported during daytime

corresponding to the period of their outdoor activities. A study conducted at Davangere [22] and Maharashtra [23] also reported high incidence during daytime. Upper limbs were involved in maximum number of cases. Bites on the lower limbs occur usually due to the accidental stamping of a snake while working, while bites on the upper limbs occur because of accidental contact with snakes while trying to hold the grass during harvesting. Victims bitten on the trunk was sleeping at the time of the incident. Fangs of cobra are fixed and immobile [24]. Definitive fang marks were observed in all but one victims of cobra bite and double punctured (fang) marks were present in the majority of the cases. A victim of snakebite who had only scratch marks and another with unappreciable fang marks also showed signs of envenomation. This suggests the importance of keeping the patient under observation in all the alleged cases of snakebite irrespective of the presence or absence of fang marks. Second quarter of the year (April to June) witnessed half of the cobra bite cases. This time of the year corresponds to the summer and pre-monsoon months in the region. During the summer months, snakes usually come out of their burrows due to the heat in search of cooler places, thereby increasing the risk of accidental contact with humans. During the harvesting season, abundant vegetation attracts the rodents to the fields and the snakes come out of their burrows in search of their prey. Thus harvesting season with busy agricultural activity creates an ideal atmosphere for snakebites. Most of the patients were brought to the hospital within the first twelve hours of cobra bite and more than half of the victims had received first aid measures prior to hospitalization. Most of the victims showed local and/or systemic signs of envenomation. Ptosis remained the chief neurotoxic feature followed by dysarthria. Ptosis has remained a commonly observed manifestation in neurotoxic envenomed patients in the earlier studies. [12, 25, 26] Polyvalent Anti Snake Venom (ASV) vials were used during specific treatment of cobra bites. No fatalities were reported from cobra bites during the study period that may be attributed to the early arrival in the tertiary care center and prompt initiation of specific therapy.

Conclusions:

All age groups were just about equally involved. Females are affected more often than males; male to female ratio being 1:1.5. Half of the cases occurred during the months of April to June coinciding with end of summer and start of rainy season. Maximum snakebites occurred in outdoor settings to farming related occupations inferring this to be an occupational hazard. Maximum incidence of cobra bites during the daytime corresponds to the period of outdoor activities and the fact that cobra being active diurnally. Envenomation was observed even when fang marks were unappreciable, suggesting the importance of keeping the victim under observation in all the alleged snakebite cases even in the absence of fang marks. Ptosis was observed as the major neurotoxic feature in envenomed victims. Cellulitis was observed as a common complication of bite due to cobra. Prompt hospitalization and specific treatment and prior first aid measures may be responsible for preventing systemic envenomation and reducing the mortality.

Table 1 Victim Profile and Salient Features in Cobra Bite

	No. of cases (%)
Gender distribution	
Male	08 (40.0)
Female	12 (60)
Occupation	
Farming	16 (80.0)
Others	04 (20.0)
Diurnal variation	
Day	16 (80.0)
Night	04 (20.0)
Place	
Outdoors	11 (55.0)
Indoors	09 (45.0)
Site of bite	
Upper limbs	11(55.0)
Lower limbs	08 (40.0)
Trunk	01 (05.0)
Fang marks	
Single	03 (15.0)
Double	14 (70.0)
More than two	01 (05.0)
Scratches	01 (05.0)
Not appreciable	01 (05.0)

Table 2 Manifestations in Cobra Bite Cases

	No. of cases (%)
Hospital Admission	
Within 1 hour	02 (10.0)
1-6 hours	13 (65.0)
7-12 hours	03 (15.0)
2 days	01 (05.0)
>3 days	01(05.0)
First Aid Prior to Hospitalization	
Tourniquet	10 (50.0)
Tourniquet & Incision	01 (5.0)
No first aid	09 (45.0)
Clinical Manifestations	
Local only	06 (30.0)
Neurotoxic only	04 (20.0)
Both local & neurotoxic	09 (45.0)
None	01 (5.0)
Final Outcome	
Recovered	17 (85.0)
LAMA	03 (15.0)
Expired	00 (00)

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