

Original Article

Snake bites with Neuropsychiatric Presentation — A Study in Hill Tracts of Bangladesh

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Abstract

Background: Snake bite is a common medical emergency and one of the important causes of mortality and morbidity in hill tracts of Bangladesh. Neurological and psychiatric features predominate as both early and late features of snake bite patients and need to be identified correctly for proper management. **Objective:** The aim of this study was to find out the pattern of early and late neuropsychiatric manifestations of snake bite in hill tracts with clinical outcomes. **Materials and Methods:** This descriptive hospital-based study was done on 121 snake bite patients during the period from January 2015 to July 2016 using simple, direct, standardized questionnaire with history, neurological examination and psychiatric evaluation. **Results:** Majority of cases (71.9%) were admitted into hospital after two hours of snake bite. Lower limb was the commonest site (75.2%) of bite. Generalized weakness (50.4%) and anxiety (52.9%) were the commonest early neurological and psychiatric manifestations. Numbness (57%) and depression (33.9%) were the commonest late neurological and psychiatric manifestations among survivors; 37.2% needed referral to tertiary care hospital and 34.7% received antivenom. Death rate was 17.4% and 73.6% were cured completely without complication. **Conclusion:** As neurological and psychiatric manifestations are common in both early and late stages in snake bite in hill tracts, these are to be considered in the total management to decrease mortality and morbidity.

Key words: Snake bite; Neurological and psychiatric manifestations; Hill tracts

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Introduction

Snake bite results in a punctured wound inflicted by the animal fangs and sometimes resulting in envenomation. Snake species mostly are not venomous and they typically kill their prey by constriction rather than venom. In every continent except Antarctica, venomous snake can be found. Between 1.2 to 5.5 million snake bite occurs worldwide each year, with 421,000–1,841,000 envenomation and 20,000–94,000 deaths.^{1,2} Such wide-ranging estimates reflect the challenges of collecting accurate data in the regions most affected by venomous snakes; many victims do not seek hospital treatment, and reporting and record

keeping are generally poor. There are more than 3500 species of snakes, but only 250 are venomous.^{3,4} In South Asia due to low death rate with high nonvenomous snakes, less than 25% cases reported to hospital for management.⁵

In Bangladesh about 200 species are found of which 52 are poisonous and 1500 to 3000 people die every year out of about 30 thousand snake bite cases.⁶ Only five snake species of them are dangerously poisonous to humans. These are King Cobra, Common Cobra, Common Krait, Russell's Viper and Saw Scaled Viper. The most common poisonous snake is Common Krait. The King Cobra lives in the dense rain forest of the hills.^{7,8}

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As there are no proper guidelines about management of snake bite in hill tracts, haphazard and ineffective treatment is being given to the tribal victims, thus adding to mortality and morbidity among hill tract people. This aspect is important because management of snake bite starts from proper identification of type of snake, effective first aid given at the site of bite, proper reassurance of the victim and speedy transport to the hospital for timely administration of proper dosage of anti-venom serum along with other supportive measures. This can invariably reduce the mortality and morbidity of these cases to a great extent.

Due to lack of transport facility and trained health care workers to identify early and late neurological and psychiatric presentations in hill tracts, it is common to delay for hospital admission. A large number of deaths in hilly areas can be prevented with prompt treatment, timely administration of anti-venom and other supportive measures.

In our country few studies are available regarding snake bites. So the present study was carried out in hill tracts to determine the neurological and psychiatric manifestations with outcome in both poisonous and nonpoisonous snake bites. This will help to manage the snake bite cases as early as possible to decrease the mortality and morbidity.

Materials and Methods

This descriptive observational hospital-based study was done in Rangamati Sadar Hospital, Rangamati, Bangladesh during the period January 2015 to July 2016. The study population included all those tribal patients who were admitted as snake bite cases during this period. Both poisonous and nonpoisonous snake bite cases were included for the study. Patients with history of trauma, insect bite or thorn prick were excluded. The data were also obtained from hospital case records, direct interrogation from relatives, friends and persons accompanying the patients. A full detailed history and proper systemic, neurological and psychiatric evaluation was performed by authors with consultant physicians. Early features were evaluated immediately after hospital admission. Late features were evaluated after four weeks among survivors. Data were collected, tabulated and statistical analysis

was performed using software SPSS version 16.0.

Ethical considerations

Informed written consent was obtained from all participants. Those identified to have severe psychological distress were referred to appropriate psychiatric services for further assessment and follow-up. Ethical clearance was obtained from Chittagong Medical College Hospital Ethical Committee (CMCH: Ref: 123/004/2015).

Results

Total 121 snake bite cases were admitted into hospital during our study period (eighteen months). Among them, 68 (56.2%) cases showed sign symptoms of envenomation due to poisonous snake bite and 53 cases were nonpoisonous snake bites. Timing of hospital admission is very important both for management and prognosis purpose. We studied admission time from snake bite to hospital arrival. Only 28.1% patients (n=34) were admitted within two hours and 71.9% were admitted after two hours of snake bite (Table I).

Table I: Snake bite to hospital admission time

Admission time	Number	Percentage
Immediately	11	9.1
Within 2 hours	23	19
After 2 hours	87	71.9

We also assessed body parts involved in snake bite. As spread of venoms depends on body part involved, blood supply and movement of the bite area, it is important to assess the common site involved. Our study found lower limb as the commonest site for snake bite (75.2%, n=91). Lowest incidence occurred in head neck region (2%) (Table II).

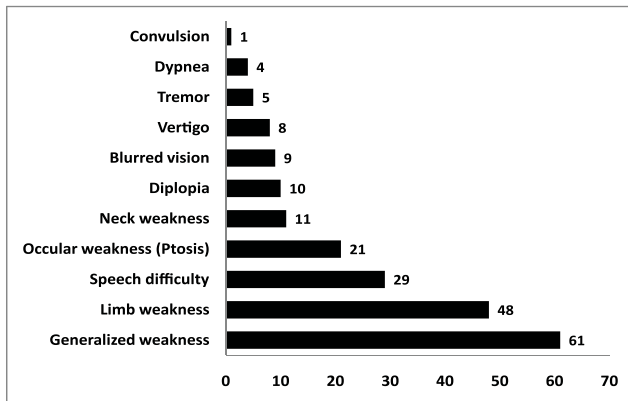
Table II: Sites of snake bites

Sites	Number	Percentage
Lower limb	91	75.2
Upper limb	21	17.4
Trunk	7	5.8
Head Neck	2	1.6

This study revealed immediate and late neurological and psychiatric features of snake bite. Each patient was allowed for multiple answers. Immediate features were assessed after hospital admission. Late features were assessed after one month of snake bite. Both

poisonous and nonpoisonous cases showed the neurological and psychiatric features.

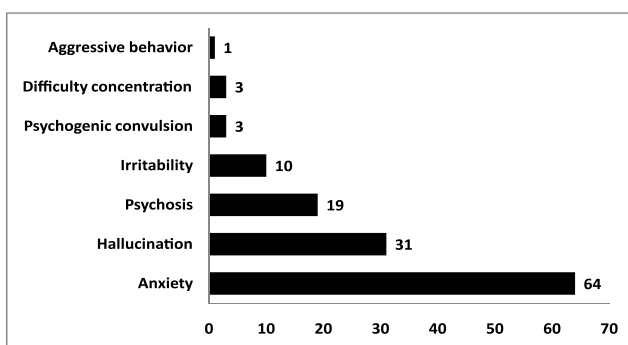
Analysis of early neurological features revealed that generalized weakness was the commonest early manifestation (50.4%, n=61). Limb weakness was found in 48 patients (40%, n=48). Speech difficulty (24%), ocular weakness or ptosis (17.4%), neck weakness (9%), diplopia (8.3%), blurred vision (7.4%), vertigo (6.6%), tremor (4.1%), dyspnea (3.3%) and convulsion (0.8%) were also found as immediate features in our study (Fig 1).



*Each patient was allowed to respond with multiple answers

Fig 1. Immediate neurological presentations of snake bites

Early psychiatric feature analysis shows that anxiety was the commonest presentation (52.9%, n=64) and 31 patients complained hallucination (25.6%). Acute psychosis (15.7%), irritability (8.3%), psychogenic convulsion (2.4%), difficulty in concentration (2.4%) and aggressive behavior (0.8%) were also found during psychiatric assessment (Fig 2).



*Each patient was allowed to respond with multiple answers

Fig 2. Immediate psychiatric manifestations of snake bites
Among 121 snake bite patients 110 (90.9%) survived.

Late neurological features were assessed after 4 weeks and eight different types of presentations were found. Numbness was the commonest late manifestation (57%, n=69). Forty three patients complained severe asthenia and tingling (18.2%), generalized pain (9.1%) and localized pain (7.4%) were also common late features (Fig 3).

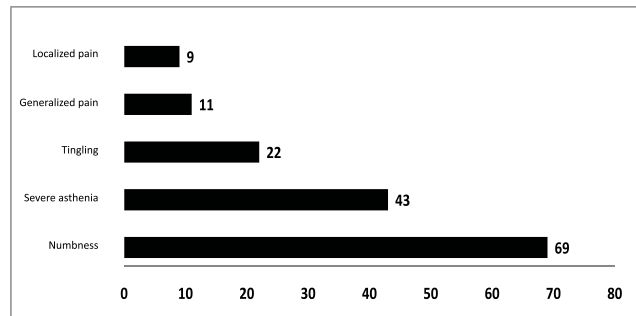


Fig 3. Late neurological manifestations of snake bite

Four weeks after snake bite, psychiatric features were analyzed by consultant psychiatrist. Depression (33.9%, n=41) and post-traumatic stress disorder (PTSD) (27.3%, n=33) were present among majority patients. Only 9 patients (7.4%) had anxiety which was common in early stage of snake bite (Fig 4).

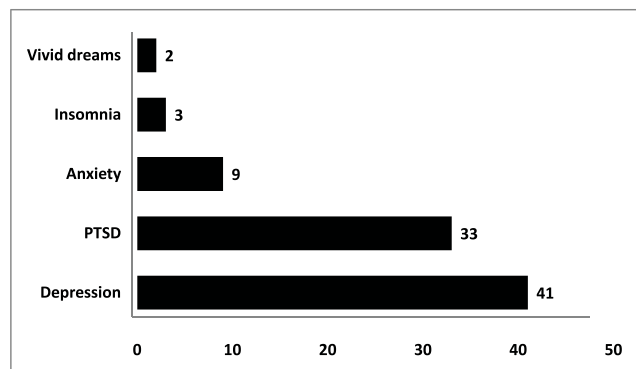


Fig 4. Late psychiatric presentations of snake bite

We found that after hospital admission only 42 cases (34.7%) received anti-venom and 79 patients were managed with symptomatic treatment. Out of them 45 cases (37.2%) were referred to tertiary care hospital for further management of complications after initial treatment. Twenty one subjects (17.4%) died due to venom toxicity and respiratory failure, 89 (73.6%) were cured completely and 11 (9.0%) cases had late complications like limb weakness, numbness, pain and chronic depression during follow-up after one month (Table III).

Table III: Final outcome of snake bite with neuro-psychiatric manifestations

	Number	Percentage
Treated with anti-venom	42	34.7
Treated without anti-venom	79	65.3
Referred to tertiary care hospital	45	37.2
Death	21	17.4
Complete cure	89	73.6
Cured with complications	11	9.0

Discussion

This study assessed for both neurological and psychiatric features of snake bites in the hill tracts with final outcomes. Both early as well as delayed stage features were assessed by consultant physician. According to the study findings the highest neurological features observed were generalized weakness (early) and numbness (late). Neurological features were observed both in poisonous and nonpoisonous snake bite cases. In nonpoisonous cases it is probably due to anaphylactic reaction from bite area and psychological stress. The highest psychiatric manifestations found were anxiety (early) and depression (late). Anxiety was reduced in late cases probably due to survival from snake bite.

This study also showed lower limb as the commonest body area to snake bite which is similar to the studies done in Nepal, Malaysia and Bangladesh.^{3-5,8-10} A study done in India showed 37% cases as upper limb area involvement which is dissimilar to our study.⁴ Most of the cases were admitted into hospital after two hours. Similar observations were reported from Nepal, India and Malaysia.³⁻⁵ In 2014 another research work at Bangladesh found ptosis was the commonest neurotoxic feature which is dissimilar to our study.⁶ The difference happens due to different snake species in hill tracts and delay in hospital admission.⁷ Death rate was low in our study compared to previous studies done in Bangladesh.⁸⁻¹⁰ About one-third cases received anti-venom which is lower compared to the studies done in India, Sri Lanka and Thailand.¹¹⁻¹⁴

To our best knowledge, both early and late neuropsychiatric features are assessed for the first time in hill tracts of Bangladesh. Total mortality and morbidity in snake bite in hill tracts is also determined

for the first time by our study. This study reveals that only one-third patients received anti-venom after snake bite. Death rate was high relative to other studies done in Bangladesh. It may be due to late arrival to hospital or due to failure of early administration of anti-venom.

Early evaluation of neurological and psychiatric manifestations will improve the diagnostic accuracy and treatment outcome in hill tracts. This can ameliorate the prognosis in snake bite patients. Primary care doctors and consultants need to develop systematic strategies to screen for early and late neuro-psychiatric features to decrease the mortality and morbidity of snake bite in hill tracts.

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