# A Retrospective Study on Snake Bites in a Tertiary Care Center in Mid Western Nepal

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## ABSTRACT

***Background:*** *Snake bites are common in tropical countries. Snakes bites are prevalent in terai and inner terai consisting of 23 districts in southern part of Nepal especially during monsoon. The morbidity due to snake bite in this area is not known. Thus we aimed to analyze the hospital records and snake bite registers to know about the epidemiological and clinical aspects of snake bite patients.* ***Methodology:*** *This was a retrospective study conducted at Bheri Hospital Nepalgunj, Nepal between may 2020 to november 2020. The patients' records were collected and relevant details were noted down. Descriptive statistics like frequency and percentages were used for analysis.* ***Results:*** *107 cases of snake envenmation were admitted during the study period. 57(53.27%) of them were males and 50(46.72%) were female. Snake bite was most prevalent in 16-30 age group 45(42.05%). Most of the people were bitten inside the house during sleeping or work 62(57.94%). Most of the patients developed neurotoxic symptoms and krait was the common snake responsible for envenomation. Ptosis 81(75.70%) was the most common clinical feature followed by shortness of breath 50(46.72%) and epigastric pain/ throat discomfort 31(28.97%). Polyvalent Anti Snake Venom (ASV) was used. The average number of ASV vials used was 8.75 vials. 103(96.26%) of the cases was successfully discharged after treatment with mortality of 4(3.73%) patients.* ***Conclusions:*** *Snake bite is common health hazards during monsoon season. Krait bites are common bites with neurotoxic features. Early recognition and treatment by ASV is life saving. Health facility strengthening is key to success. Snake bite awareness campaign should be run at community level.*

***Key words:*** *Snake bite, envenomation, krait, anti snake venom, neurotoxin*

## 1. INTRODUCTION

Snake bite is a neglected public health problem in tropics and sub tropics globally.[1] The Snake bite is a occupational hazard, affecting poor rural communities like farmers, plantation workers and fishermen around the world.[2] In Nepal, WHO estimates that 20,000 people are bitten by snakes each year, resulting in over 1000 deaths. [3] So far, 89 snake species have been recorded in Nepal . Among them 17 species of snakes found in Nepal have front-fanged venom apparatus and are considered to be highly venomous and dangerous.[4] The commonest poisonous snakes in the terai and inner terai regions of Nepal are Krait and Cobra.[5]

Snake bite can be treated by polyvalent Anti Snake Venom (ASV). The early recognition and transfer of patient to snake bite treatment center is the mandatory to reduce the mortality. Snake bite awareness progamme should be launched at local levels. Appropriate interventions can be planned if data regarding different aspects of snake bite are available which is scarce even at national level. Thus we aimed to study the demographic and clinical aspects of snake bite at Bheri Hospital, Nepalgunj.

## 2. METHODOLOGY

This was a retrospective study conducted at Bheri Hospital Nepalgunj, Nepal between May 2020 to November 2020. The ethical clearance for the research was taken from hospital administration as well as Nepal health research council. The patients record files and snake bite register was collected from the Emergency Department and record section of the hospital. The patients' demographic details, history of snake bite, clinical features, hospitalization, treatment and final outcomes were noted in preformed proforma. The collected data were entered in Microsoft Excel 2010. Frequency and percentages were calculated and represented in tables.

## 3. RESULTS

A total of 107 cases of snake bite envenomation was admitted during may 2020 to november 2020. Out of 107 patients, 57(53.27%) of them were male and 50(46.72%) were female. All age groups were victim of snake bites but patients in 16-30 age group were most prevalent 45(42.05%) followed by 25(23.36%) in 0-15 age group. Most of them were bitten inside the house during sleep or work 62(57.94%). 67(62.61%) of the people could recognize the bite site and fang marks were present. Among them most of the people were bitten in the upper limb 65(60.74%). Majority of the patients 77(71.96%) were bitten at evening or night between 6pm to 6am. Tourniquet was only used in 10(9.34%) of the cases. 61(57%) of the patients or relatives were able to recognize the snake. Krait was the most prevalent bite 42(39.25%), cobra 13(12.24%), viper 6(5.60%). However 46(42.99%) bites were unidentified but they were having Neurotoxic features most probably krait.

**Table 1: Demographic profiles of snake bite patients.**

| Variable | | Number of Patients | Percentage |
|---|---|---|---|
| Age in years | 0-15 | 25 | 23.36 |
| | 16-30 | 45 | 42.05 |
| | 31-45 | 15 | 14.01 |
| | 46-60 | 14 | 13.08 |
| | >60 | 8 | 7.47 |
| Sex | Male | 57 | 53.27 |
| | Female | 50 | 46.72 |
| Location | Rural | 82 | 76.63 |
| | Urban | 25 | 23.36 |
| Place of bite | indoor | 62 | 57.94 |
| | Out door | 45 | 42.05 |
| Site of Bite | Upper limb | 65 | 60.74 |

| | | | |
|---|---|---|---|
| | Lower limb | 27 | 25.23 |
| | Trunk | 15 | 14.01 |
| Time of bite | Day | 30 | 28.03 |
| | Night | 77 | 71.96 |
| Type of snake | Krait | 42 | 39.25 |
| | Cobra | 13 | 12.14 |
| | Viper | 6 | 5.60 |
| | Unidentified Neurotoxic | 46 | 42.99 |

**Table 2: Clinical profile and outcome of snake bite patients.**

| Variable | | Number of patients | Percentage |
|---|---|---|---|
| Sign and symptoms | Ptosis | 81 | 75.70 |
| | Shortness of breath | 50 | 46.72 |
| | Throat discomfort | 31 | 28.97 |
| | Epigastric pain | 31 | 28.97 |
| | Salivation | 19 | 17.75 |
| | Dysphonia | 16 | 14.95 |
| | Myalgia | 11 | 10.28 |
| | Dysphagia | 10 | 9.34 |
| | Swelling | 8 | 7.47 |
| | Vomiting | 6 | 5.60 |
| | Bleeding | 2 | 1.86 |
| | Diplopia | 2 | 1.86 |
| Numbers of ASV vials | 0-10 | 95 | 88.78 |

| | | | |
|---|---|---|---|
| used | 11-20 | 12 | 11.21 |
| | >20 | 0 | 0 |
| Outcome | Improved | 103 | 96.26 |
| | Death | 4 | 3.73 |

During the course of presentation and stay in the hospital, ptosis 81(75.70%) was the most common clinical feature followed by shortness of breath 50(46.72%) and epigastric pain/ throat discomfort 31(28.97%). The patients were treated according to the World Health Organization treatment protocol of snake bite. Polyvalent Anti Snake Venom (ASV) was used. Ninety five (88.78%) of patients was treated with ASV 0-10 vials. 12(11.21%) received ASV vials between 11-20. No patient required ASV above 20 vials. The average number of ASV vials used was 8.75.The minimum ASV vials was 4 and maximum of 16. Most of the cases 103(96.26%) cases were treated successfully and discharged home. However there was mortality of 4(3.73%) patients.

## 4. DISCUSSION

A total of 107 snake envenomation cases were admitted during the study period. In this study higher number of males 53.27% were victim of snake bite which is supported by different studies over the country.[2,6,7] Female predominance was found in numerous studies.[8,9] However study by Vp Poudel show comparable number of male and females.[10] Predominant snake bites were in the age group 16-30 42% followed by 14% in 31-45 age group. Similar results were found in the studies where young adults and middle age persons were victim of snake bite.[8,10-12] A study from Bangladesh revealed higher number of snake bites in 10-19 age group.[2.] The people between 16 to 45 are the most active and productive population involved in fields, agriculture, business and outdoor activities. Therefore they are at high risk to encounter snake during their activities.

Snakes bites were more in the villages and rural areas 76.63% in this study, supported by other studies.[8,13-16] Village areas has farms, bushes, woods, rat holes where snake have their habitat. During rainfall season they come out try to find safe place and they may enter houses and encounter humans indoor or outdoors. Around 58% of the people were bitten inside the house and usually during evening and night 72% hours especially during sleep. Other studies revealed day time bites were more predominant.[7,17,18] which contradicts to our finding. This may be due to the fact during monsoon all the habitats are flooded with water and snakes rise to higher lands and they enter the human habitats. Snakes are active during night where they can encounter humans and thus bite may occur.

In this study the snake bite occurred mostly in the upper limbs 60.74% in the fingers and arms. This was similar to the findings of other studies.[10,11] However numerous studies show bites were more in the lower limbs than the upper limbs.[2,6,7,9,12] Lower limbs are more vulnerable to bites as they are most dependent part of body and accessible while standing and there is chance of stepping over the snakes while walking. In this study the upper limbs may be bitten during encounter with snakes while working in fields, cutting grass, taking out fire woods from store house etc. Most of the victims could not identify the type of snakes 43%, among the identified krait 39% was the most common. This finding was consistent with other studies where around 60% of snakes were not recognized.[7,8,19]

Ptosis 75.7% was the most predominat clinical feature of snake bite followed by breathing difficulty 46.7% which was similar with the studies where ptosis were present in more than 90% and breathing difficulty in above 70%.[8,10] Another study reports ptosis in 100% of the cases in 628 patients.[11] Throat discomforts,dysphonia, salivation, dysphagia, were common presentations as compared to this study.[2,8,10,11] The average ASV vials used was 8.75 which was much lower than 20 to 29, 22 and 21, vials used in previous studies respectively.[8,10,11] This may be due

to the strict monitoring and avoidance of unnecessary over use of ASV and also due to early recognition of snake bite and treatment according to the National and WHO protocols of management of snake bite.

103(96.26%) of patients were discharged after successful treatment. There was mortality of 4(3.73%) cases which was similar with the study Hansdak SG et al.[20] Other studies reports mortality of 6.17%, 16.1% respectively,[8,11] which is quite high than the present study. The lower mortality in the present study points toward the improving standards of care in managing snake bite, provision of training to Emergency staffs and management of intensive care unit and ventilator supports for those with respiratory paralysis. The mortality is ought to raise if there is delay in seeking services, the traditional healers like *dhami/ jhakri*. There for early transport of patients to snake bite center is mandatory. Every local bodies should arrange ambulance services preferably or arrange motorcyclist volunteers to take snake bite victims to hospitals.

## 5. CONCLUSIONS

Snake bite is a major health problem in the terai and inner terai of Nepal during monsoon season. Neuro toxic snake bites especially krait bites are common. Snake bites can be treated by polyvalent ASV. Early recognition and treatment of snake bite is life saving. Snake bite centers should be well equipped with critical care facilities and trained manpower.Delayed transfer of patients may increase mortality. Traditional healing practices should be discouraged. Awareness about snake bites, first aid should be done at community levels.

## 6. ACKNOWLEDGEMENT: None

**7. Conflicts of interest**: None

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