CLINICO-EPIDEMIOLOGICAL PROFILE, HEALTH CARE UTILIZATION AND PRACTICES REGARDING SNAKE BITE AT ILAM DISTRICT OF EASTERN NEPAL

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ABSTRACT

Introduction

Snake bite is neglected problem of the rural agrarian society of the world. Nepal is one of the vulnerable countries of snakebite. The utilization of health care services and practices regarding snake bite is not known.

Objective

This objective of the study was to explore clinico-epidemiological profile, health care utilization and practices regarding snake bite at Ilam District of eastern Nepal.

Methodology

This was a cross-sectional study and conducted from 25thMarch to 25th May 2013 using a systematic random sampling of 300 people from communities of Ilam district. The data was collected after receiving informed consent. The collected data was entered into Microsoft excel and analysed by using SPSS.

Results

The majority (76.7%) of the respondents had seen snakes in their locality. The major snake noticed was mountain pit viper (*Ovophis monticola)*- Grube (94.8%). Among respondents, 5.3% had a history of snake bite which was predominant among productive age of 15-39 years. The most common bitten part of the body was leg (56.3%). There was no any serious injuries and death. Treatment was done by different modalities such as by using local antidote (31.3%) at the bite site and by soap-clean water (25%). Sixty-nine percent of the snake bite victims utilized modern health care system. Charali snake bite management center, Jhapa was the major treatment center. Seven out of 10 had knowledge of using a tourniquet. After full recovery from a snake bite, 1 out of 5 had avoided milk due to their false belief.

Conclusion

Active age group was more victimized. The commonest bitten part was a leg. The knowledge of first aid of snake bite was not adequate and many were unaware of post snake bite practices. Reassurance, early first aid and timely transportation to health center save many victims of snake bite.

KEY WORDS

Geographic locations, Nepal, patient acceptance of health care, snake bites

INTRODUCTION

Snakes have been feared, worshiped, or loathed in South Asia from ancient times. In this region snakes remain a painful reality in the daily life of millions of rural peoples. Cobras snakes appear in many tales and myths and are regarded as sacred by both Buddhists and Hindus. Though anti-snake venom is produced in large quantities by several public and private manufacturers however, most victims of snake bite don't have access to quality care. In many countries, both morbidity and mortality due to snake bites are alarming. The snake bite envenoming is the neglected issue of the modern era.[1] An exact measure of the global burden of snakebite remains limited despite many attempts to estimate it. Apart from few countries, reliable figures on snake bite incidence, morbidity, and mortality are not well defined.[2] In Nepal, each year more than 20,000 cases of envenoming occur with 1,000 recorded deaths.[3] The district hospital records review of Nepal showed that national figures underestimated the incidence of snake bite.[4] In a community based research conducted in southeast Nepal in 2002 found that annual incidence and mortality rates of snake bite envenoming was 1,162/100,000 and 162/100,000, respectively.[5] In Nepal and Bangladesh, envenoming by green pit vipers is very common.[4] In a study, it was reported that bites by the mountain pit viper (*Ovophis monticola*) occur in Nepal where it is the most commonly encountered poisonous snake at altitudes of 900–2,700 m.[6] In a study from hilly region of eastern Nepal, it was reported that many people still use traditional healers service for their day to day health care and the use of government health facility utilization was low as compared to private health care facility. The people having the concept that modern health centres are costly and living for a longer period in that place were the primary user of traditional health care system. This will challenge the modern health care service utilization in eastern Nepal.[7] In Nepal, snake bite is an important cause of many deaths. It is due to poor health services in rural areas especially for the lack of anti snake venom(ASV) treatment facility.[8] Hence this study was conducted with the objective to explore clinico-epidemiological profile, health care utilization and practices regarding snake bite at Ilam district of eastern Nepal.

METHODOLOGY

This study was community-based cross-sectional study and conducted between 25th March to 25th May 2013. The site of study was Pashupatinagar and Fikal community of Ilam district of eastern Nepal. The systematic random sampling method was used to select 300 household for collection of the necessary information. Data was collected by the house to house visit with pretested questionnaire. The collected data was entered in Microsoft excel and analyzed using SPSS. Ethical clearance was taken from concerned authority and informed consent was taken prior to the study.

RESULTS

The various socio-demographic characteristics of respondents was presented in table 1. Regarding distribution of age of respondents more than half (51.3%) were of age 20-39 years with mean age of 38.90 years. Majority (58.3%) of the respondents were male. The major ethnicity was hill Janajati (49%). The majority (83%) were literate among whom one-fourth were middle school certificate holders. Four in every five respondents were married and living together. Nine out of ten (92%) head of households was employed and their major occupation was tea plugging and farming.

Table 1: Socio-demographic characteristics of respondents (n=300)

Characteristics	Number	Percent
Age (years)		
15-19	20	6.7
20-39	154	51.3
40-59	96	32.0
≥ 60	30	10.0
Mean ± S.D.	38.90 ± 15.16	
Sex		
Male	175	58.3
Female	125	41.7
Case / Ethnicity		
Brahmin/Chhetri	115	38.3
Hill Janajati	147	49.0
Terai	23	7.7
Dalit	15	5.0
Marital Status		
Married & Living together	253	84.3
Widowed/Separated	11	3.7
Never Married	36	12.0
Major Occupation of HOH		
Employed	276	92.0
Unemployed	24	8.0
Literacy Status		
Illiterate	51	17.0
Literate	249	83.0
Graduate/Post graduagte	25	10.0
Certificagte Level	60	24.1
High School	50	20.1
Middle School	63	25.3
Primary School	51	20.5

Figure 1 shows the respondents who had seen asnake in their locality. Among the respondents, almost every 8 out of 10 (76.7%) had seen snakes in their locality.

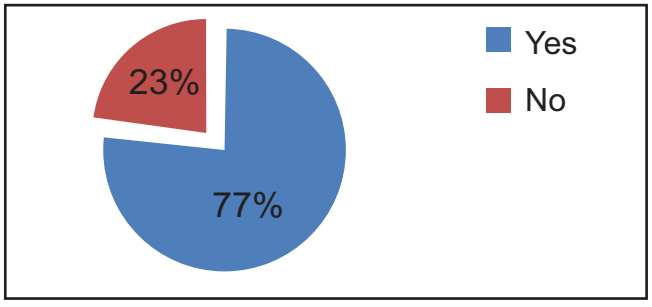

Figure 1: Respondents who had seen snake in their locality (n=300)

As shown in figure 2 and 3,the major snake identified was Gurbe (mountain pit viper, Scientific name: *Ovophis monticola*) (95%) followed by Sabe (eastern trinket snake, Scientific name: *Orthriophis cantoris*) (3.5%) and Dhaman (Rat Snake, Scientific name: *Ptyas mucosa*) (1.8%). Figure 3 illustrate the Gurbe which was identified in eastern Nepal.

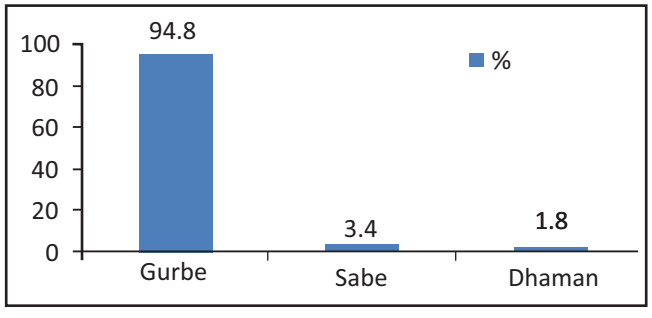

Figure 2: Types of snake seen by respondents (n=230)

Figure 3: Gurbe (mountain pit viper, Scientific name: *Ovophis monticola*)

Table 2 provides different characteristics of snake bite. Among the respondent, 16 persons were bitten by a snake. Snake bite was commonest in the active age group of 15-39 years (43.75%) with no gender difference. The majority (56.3%) were bitten in the leg. None of them have any serious injuries and death. Regarding the first aid measure tourniquet was applied by 31.25% at the bite site followed by cleaning bite site by soap/clean water (25%). Among the snake bite victims, the majority (68.75%) received treatment from Charali snake bite management center, Jhapa where anti-snake venom is available. All the victims were completely cured.

Table 2: Snake bite characteristics

Characteristics	Number	Percent
History of snake bite (n=300)		
Yes	16	5.3
No	284	94.7
Frequency of snake bite (n=16)		
1 bite	16	100.0
Age (years)of snake bite victim (n=16)		
< 15	2	12.50
15-39	7	43.75
40-59	3	18.75
> 60	4	25.0
Gender distribution among snake bite (n=16)		
Male	8	50.0
Female	8	50.0
Parts of body bitten (n=16)		
Hand	7	43.7
Leg	9	56.3
Snake bite first aid used (n=16)		
Soap/clean water	4	25.0
Tourniquet	5	31.25
Mud/soil	1	6.25
Nothing	6	37.5
Snake bite treatment center (n=16)		
Charali snake bite treatment center (Anti-venom available)	11	68.75
Local healing	5	31.25
Outcome of treatment (n=16)		
Completely cured	16	100.0

Table 3 shows the awareness on snake bite treatment. Regarding awareness on first aid management of snake bite victims, every seven out of 10 responded that tourniquet should be used as a method of first aid. Regarding awareness on post snake bite food taboos, after full recovery from a snake bite, 22% had a wrong belief of avoiding milk followed by water (6%). Figure 4a, 4b illustrate the viper bite victims showing their hands.

Table 3: Awareness on Snake bite treatment

Characteristics	Number	Percent
Awareness on snake bite first aid		
Traditional methods	66	22.0
Incision and drainage	24	8.0
Tourniquet	210	70.0
Post Snake bite food Taboos		
Avoid Milk	66	22
Avoid Water	18	6
Avoid Medicine	3	1
No Avoidance	213	71

Figure 4a, 4b: Viper bites victims showing their hand at eastern Nepal

DISCUSSION

In the present study, the majority of the head of households were employed. Ilam is the city which has a rich source of tea farming. Tea farming gives employment to lot of people in Ilam which ultimately strengthen their economic status. Tea plucking was major occupation because of famous tea farming culture in Ilam district. Similar to this study, dominant profession among the victims of snake bite were farmers, plantation workers, herders, fishermen, snake restaurant workers and other food producers.[8] In this study majority of the snake seen were of viper groups such as Gurbe and Sabe. This is further supported by the studies conducted by Shah KB et a land Tillack F et al where the mountain pit viper encountered at altitudes of 900–2,700 meters was the most common.[6,9] The present study found that the majority of snake bite envenoming victims were from the productive age of 15-39 years. Similarly to this study, the mean age of snake bite envenoming victims was 32 years.[5] Almost similar result was found, where majority of the snake bite envenoming victims were in the productive age of 15 and 45 years.[10] No gender difference on snake bite envenoming was found in the present study. In contrast, the study done by Jarwani B et al showed the majority of the victims were male.[10] It was found that the snakebite cases were almost equally distributed in both the sexes although, males have shown slightly higher proportion.[11]

The lower extremities were the most common site of snake bite envenoming in our study which is similar to the study by Devkota U N et al.[11] Similar to this study it was reported that, snake bite was mostly on the lower extremities (83%).[12]

In the present study, none of the victims had any serious complications and death. It may be due to non-fatal poisoning from viper group of the snake. The timely transfer of snake bite victims to snake bite management center may be the another region behind no serious complication and fatality from snakebite. Palangasinghe DR et al reported a previously healthy male who is young 18 years had bilateral severe pulmonary hemorrhages resulting in a fatal outcome following Russell's viper envenoming.[13] Seignot Preported 44 year European who was bitten on the foot in Djibouti, probably by an African viper had fatality.[14]

Regarding the use of first aid measure in this study, tourniquets were applied followed by cleaning bite site with soap/clean water. This is a wrong practice of snake bite envenoming first aid management. This study is supported by the study of Deb Prasad Pandey which state that no victims followed the first-aid recommended by World Health Organisation in Nepal.[15] This is also supported by the study of Hansdak G et al where more than half of snake bite victims used harmful and inappropriate first aid methods after snake bite envenoming.[16] Two studies in Nepal and Bangladesh showed that 90% and 98% of snake bite envenoming, respectively, used tourniquets.[17-18] The majority of victims of snake bite envenoming first report to traditional healers. Tourniquets were the main first aid measure used by the victims (86%).[19] Incisions at and around the bite site were made in 28% of envenomed victims of snake bites and in 13%–14% of those without signs of snake bite envenoming.[18] After snake bite envenoming first aid given was use of tourniquet (16.2%), local application of chillies, herbal medicine and lime, etc., (1%).[10] In contrast to the above practice reassurance to the victim, immobilization of the bitten part, applying a pressure bandage and timely referral to the appropriate health centre is a correct technique in snake bite management.[20] However, time factor plays a very important role in the survival of the victims of snake bite envenoming. The strong aspect of our study was that majority received treatment from Charali snake bite management center which is biggest snake bite treatment centre in eastern Nepal with modern health care system where anti-snake venom is available regularly. Even though the distance was quite long. Cruz LS reported that delay and scarcity of administration of antivenom in victims of snake bite envenoming, poor health care services, and transportation difficulties from rural areas to health centers are important significant factors that contribute to the high case-fatality ratio of snakebite victims.[21]

In this study regarding awareness on first aid management, 70 percent cited the use of tourniquet, 22 percent traditional method and 8 percent of practicing sucking blood by mouth

from bite site and doing incision and drainage. These first aid practices deteriorates the condition of the victims of snake bite envenoming. We have to encourage them to change this type of awareness on snake bite envenoming. Pandey DP reported that first aid training on snake bite envenoming changes the people's attitude in management of snake bite envenoming victims and this is one of the effective ways in decreasing mortality of snake bite victims.[15]

This research also assessed awareness on post snake bite food taboos, after full recovery. Estimated figure showed that, 22 percent had wrong myths of avoiding milk, 1 percent medicine and 6 percent water. These all myths are wrong. They can continue these food items after full recovery of snake bite envenoming.

CONCLUSION

The snake bite in the hilly region of eastern Nepal is common. The most common snake reported was Gurbe. The productive age group was the major victims of snake bite. The leg was the common site of envenoming without serious complication and death. Lack of awareness regarding snake bite first aid and post snake bite food consumption practices were common among the surveyed population.

RECOMMENDATIONS

We recommended conducting series of awareness program on snake bite focusing on tea-pluckers. Proper transportation facility to snake bite victims and local availability of anti-snake venom in primary health care centre is the utmost need.

LIMITATION OF THE STUDY

Being a short duration study, we are not able to include large geographical area and respondents. There may be a selection bias, as we asked the question to one of the family members. Due to questions related to past events, we could not fully omit the recall bias.

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CONFLICT OF INTEREST

We declare no conflict of interest.

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