

Impact of First Aid Training in Management of Snake Bite Victims in Madi Valley

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ABSTRACT

Background: Tropical lowland on Nepal is at full of risk to snake bite. The snake bite mortality is due to lack of awareness about proper management of victims. The study aims to assess the change in the pattern of management of snake bite victims after first aid training.

Methods: A retrospective study was done from October 2007 to October 2008 among 43 snake bite victims in rural Madi valley comprising of 4 village development committees where first aid training was conducted one year before.

Results: Only 26% of the snake bite victims approached traditional healer before arriving at the health facility. The case fatality rate dropped to 22% after venomous snake bite. Pressure Immobilization bandaging and local compression pad immobilization technique was used by 56% who went to the health facility. Mean duration for reaching health facility was 61.51 ± 33.55 minutes. Common places of bite were field 16 (37.2%), Indoor 6 (14%), while sleeping 6 (14%), and yard 6 (14%). Lower extremity bites were 32 (74.4%), upper extremity 8 (18.6%) and head 3 (7%). Bicycle was the commonest mode of transport 22 (51%) followed by ambulance 9(27.9%) and Motorcycle 6 (11%).

Conclusions: First aid training changes the attitude of the people in management of snake bite victims and is one of the effective ways in decreasing mortality. Nationwide campaigning should be done especially at snake bite prone area about the proper first aid technique to improve the awareness level of the general population.

Key words: first aid, mortality rate, snake bite, traditional healer, venomous snake

INTRODUCTION

Snake bites are more prevalent and fatal in Africa and Southeast Asia region.¹ In Nepal, it is estimated to be at least 20,000 snake bites with about 1000 deaths in hospitals each year, mainly in the Terai region.²

About 26 districts of the tropical lowland Nepal are at full of risk to snakebite.³ The bites usually happens during midnights, with further delay in treatment due to initial consultation with the traditional healer, lack of transport and availability of resourceful snake bite

treatment center especially in rural Terai region where venomous snakes are more prevalent.^{1,4,5} The need for advocacy for first aid management using bednets, proper immobilization technique, identification of venomous snake and early transport to the center is essential.^{4,8}

The objective of our study is find the knowledge status of the people of Madi valley after first aid training and its subsequent impact on approach to management of snake bite victims.

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METHODS

A descriptive observational study was carried out at two phases in rural Madi valley which comprises 4 VDCs viz. Gardi, Bagauda, Kalyanpur, Ayodyapuri of Chitwan district in central southern part of the country from October 2007 to October 2008. Ethical approval was taken from Nepal Health Research Council. In the initial

phase, in October- November 2007, 165 participant from different sectors were selected purposively and trained for consecutive three days about the first aid measures with emphasis on attitude change towards traditional knowledge for healing, identification of venomous snake, pressure immobilization, importance of quick, best and early transport to nearby snake bite treatment center and environmental importance of snake (Table 1).

Table 1. Types of participants

Participant	Bagauda	Gardi	Kalyanpur	Ayodyapuri	Students	Total
Local healers	7	4	6	3	-	20
Local Non Governmental Organisation	1	-	-	2	-	3
Health workers	1	-	1	1	-	3
Veterinary Paramedic	1	-	-	-	-	1
Farmers	25	18	28	30	-	101
Students	-	-	-	-	37	37
Total	36	22	36	38	37	165

The follow up study of the first-aid education program was carried out during October 2008. Three well instructed interviewer appointed for data collections visited the affected snake bite victims and the health facility and extracted data by the use of pre-tested questionnaires. Consent was taken during the interview. One of the investigators crosschecked for effective data collection. The records of snakebite during impact study were crosschecked with the data records from Primary Healthcare Center (only one snakebite treatment center

in Madi valley), Basantapur, and Bharatpur Hospital (only one referral snakebite treatment center for about 4 adjoining districts), Bharatpur, Chitwan. The data was analyzed using Microsoft excel 2007 and SPSS version 11.5

RESULTS

The demographical profile of the study area is shown below (Table 2).

Table 2. Demographical Profile of Madi Valley, Chitwan (Nepal Census, 2001)

VDCs (Village Development Committee)	Gardi	Kalyanpuri	Bagauda	Ayodhyapuri	Total
Population	10453	7543	11544	11804	41,854
Literacy(able to read and write)	5217	4181	5652	5750	20,800

Out of the total population, the literacy rate of the areas seems to be satisfactory.

Out of the total 43 snake bite victims, the mean age of presentation was 32.42±18.39

with maximum age being 70 years and minimum age being 3 years.

Out of the victims 22 were male and 21 were female.

Table 3. Place of snake bite

Place of bite	Frequency(Percent)
Bed	6 (14.0)
Chautari	1 (2.3)
Field	16 (37.2)
Forest	3 (7.0)
Hut	1 (2.3)
Indoor	6 (14.0)
Tap	2 (4.7)
Toilet	1 (2.3)
Yard	6 (14.0)
Total	43 (100.0)

Majority of the bites occurred outdoors while working in the field followed by while walking in the forest and sleeping during the night (Table 3).

Site of bite	Frequency(Percent)
Hand	8 (18.6)
Head	3 (7.0)
Leg	32 (74.4)
Total	43 (100.0)

Lower extremity bite accounted for the majority of the bite followed by upper extremity (Table 4).

	Number	Minimum	Maximum	Mean	Std. Deviation
Time to nearby health center (minutes)	43	15	135	61.51	33.551

Mean duration for reaching the healthcare facility was approximately one hour however this also comprises the four cases which was send directly to Bharatpur hospital with a mean duration of approximately 2 hours (Table 5).

Means of Transport	Frequency (Percent)
[Walking (30 minute) Stretcher to Bankatta + Ambulance]	1 (2.3)
Ambulance	9 (20.9)
Ridden in Cycle	22 (51.2)
Ridden in Motorbike	6 (14.0)
Walking	4 (9.3)
Walking, motorbike	1 (2.3)
Total	43 (100.0)

Bicycle seems to be the best means of transport in that area followed by ambulance and motorcycle (Table 6).

Venomous bite accounted for 2 pit-viper bites and 9 elapid bites. One fourth of the bite was venomous with one bite unable to identify the characteristics of the bite. Out of 9 elapid bites, 2 victims died accounting for case fatality rate of 22.22%.

Type of Snake	Frequency (Percent)
Nonvenomous	31 (72.1)
Venomous	11 (25.6)
Unknown	1 (2.3)
Total	43 (100.0)

Visit to traditional healer	Frequency(Percent)
No	32(74.4)
Self chanting	2(4.7)
Yes	9(20.9)
Total	43(100.0)

Only 26 % (20.9%+4.7% = 25.6%) of the snake bite victim went to the traditional healer which also included self chanting.

Out of 32 (74%) who didn't visited traditional healer, 56 % adopted pressure immobilization bandaging (PIB) and local compression pad immobilization (LCPI) technique and 18 % directly presented to snakebite treatment center.

DISCUSSIONS

The study assesses the impact of the first aid training in the change in pattern of management of snake bite victims and improvement in morbidity and mortality status of the population.

Study conducted by Pandey in the same area suggested the 56% of the snake bite victims went to traditional healers before arriving to hospital causing substantial delay in intervention.⁵ In Kwazulu Natal study, 62.5% of the victims consulted traditional healer causing delay of 6 hours on reaching the hospital.⁹ Consultation of a traditional healer is a classic cause of delay and exposes the patient to useless or dangerous interventions.¹⁰⁻¹³ In contrast our study showed consultation of healer in 26 % of the victims reflecting the efficacy of the first aid training measures in changing the attitude and approach to manage snake bite victims. It was comparable to the findings of only 22% of the victims initially consulted a traditional healer in a study in southeastern Nepal.⁴

PIB and LCPI has been recommended by World Health Organization (WHO) for first aid management of snakebite victims.¹ Use of local compression technique has also been shown to be effective against Russell viper.¹⁴ Sharma et al. reported the total absence of use of the

pressure-immobilization method.⁴ Presentation of 56% of the snakebite victims in snakebite treatment center with PIB and LCPI further justified the effectiveness of the first aid training although no comparable data were found.

Mean time duration of transport to hospital suggested by our study was 61.51±33.55 minutes. Some studies suggested early transport to medical care using proper vehicles^{1,4} and seeking help of a traditional healer causing substantial delay in reaching the healthcare.^{4,5} A study done in Nawalparasi and Chitwan, a place with a similar geography suggested one to two hours delay in reaching healthcare services and reported the proportion of snake bite cases and death were higher when the duration exceeded more than 6 hours.⁵ Another study done by in southeastern Nepal suggested the presentation of 90% venomous bite in hospital was after 3 hours.¹⁵ A study done at Hospital in Northern India where the venomous biting species shows similar pattern to the tropical lowlands of Nepal suggested nine hours of delay in transport time.¹⁶ The figure of our study reflects improvement in the early transport especially due to drop in seeking of healer on their way to the health care facilities.

Sharma et al. noted both the non-availability and the inappropriateness of transport means in southeastern Nepal that were found associated with an increased risk of death.⁴ Bicycle was found to be the preferred source of transport followed by motorbike and ambulance and some preferred walking. But, Sharma et al. found motorcycle (42%) more preferred source of transport followed by bicycle (22%), bus (15%), Taxi (10%), carried by human (4%).⁴ Sharma et al. conferred that the use of a motorcycle, the quickest means of transport on the simple trails linking most villages in rural Nepal, was strongly associated with survival.⁴ The figure suggested that the training made them use of the available local transport system in bringing the victim quicker to the healthcare and hence improvement in overall morbidity pattern. The promotion of rapid transport of victims to medical facilities enables to manage patients with severe signs of neurotoxicity⁶ because 80% of deaths caused by snake bites in this region occur in the village or during transport to the treatment center.⁴

Venomous bite accounted for 11 (25%) of the cases, out of which 9 were elapids and 2 were pit vipers bites. Out of 9 elapids victims, 2 died, one on their way to hospital and other in the hospital accounting for case fatality rate of 22%. The figure is decreased as compared to similar studies done by Sharma et al. which shows 27%⁴ and Pandey which shows 27%⁵ and 25%.¹⁷ Although, the figure shows the decreasing trend it is too small to compare the values.

Majority of bites occurred while working in the field 37% followed by indoors 14% and while sleeping (14%). Sharma et al. study in southeastern Nepal shows field (47%), indoor (18%)⁴ and Pandey study in the similar areas shows field (32%), indoor (24%) and while sleeping (24%) which are comparable.⁵ This shows that first aid training does not show the change in pattern of bites at different places. It only emphasizes the focal areas where the training has to be centered.

Lower extremity bite accounted for 74% of the cases followed by upper extremity 18% and head 8%. Sharma et al accounts lower extremity bite (79%), upper extremity bite (20%) and trunk (1%) akin to our study.⁴ Pandey figures are also comparable which shows upper extremity (66%), lower extremity (24%) and head (2%).⁵ Among these cases male and female both accounted approximately 50% cases with the mean age group of 32 years. Other studies showed male preponderance more citing the reason that male are working more in the field.³⁻⁵

Poorly informed rural populations often apply inappropriate first-aid measures and vital time is lost before the victim is transported to a treatment centre, where cost of treatment can constitute an additional hurdle.¹⁸ Care-givers need better training and supervision, and national guidelines should be fed by evidence-based data generated by well-designed research studies.¹⁸ The deficiency of snake bite management in South Asia is multi-causal and requires joint collaborative efforts from researchers, antivenom manufacturers, policy makers, public health authorities and international funders.¹⁸

Although the study was done to delineate the impact of change in attitudes in management of snake bite victims the study still has its limitation. The study needs to be done for longer duration of period with more study subjects and also highlighting on other aspect of first aid training. Hence, further studies are still recommended to validate the finding especially in tropical areas where the mortality rates are higher.

CONCLUSIONS

First aid training for snake bite management changes the attitude of the people toward early management of snake bite victims before reaching the health facility and is one of the effective ways in decreasing mortality of the snake bite victims.

Further study should be done at different regional level to authenticate the finding of the research and nationwide campaigning is recommended to boost the level of knowledge of the general population against the problem.

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