

A Study on Snake Bite Victim Treatment Outcome in Tertiary Care Hospital in Bihar, India

Braj Nandan Kumar Sah¹, Sara Sultana², Jeetendra Kumar³

¹Tutor, Department of Pharmacology, Jawahar Lal Nehru Medical College, Bhagalpur, Bihar, India.

²Tutor, Department of Pharmacology, Jawahar Lal Nehru Medical College, Bhagalpur, Bihar, India.

³Associate Professor & Head, Department of Pharmacology, Jawahar Lal Nehru Medical College, Bhagalpur, Bihar, India

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Corresponding author: Dr. Braj Nandan Kumar Sah

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Abstract

Objectives: This present study was to evaluate the treatment outcome of snake bite victim in tertiary care hospital, in northern Bihar, India.

Methods: A total of 50 snake bite victim who were reported in emergency unit were enrolled in this study. The information was recorded in a structured Performa from patient bed –head ticket (BHT). All the information were categorized into type and site of snake bite, time lapsed from the time of bite till the time of hospital admission, clinical characteristics of snake bite, severity, time and quantity of antsnake venom used and treatment outcome.

Results: Most of the cases 32(64%) were males. Preponderance 20(40%) was more in age 21-30 years. Clinical characteristics of snake bite victim was in range from mild cellulitis 27(54%) to severe respiratory difficulty 13(26%). Maximum patient arrival in hospital after the bite was 2-7 hours. Majority 34(68%) of cases were administered 10 vials ASV. Only 6(12%) patients were administered 20 vials ASV.

Conclusions: The preponderance of snake bite victims is more in younger age male populations. Hence, early hospitalisation with recognition of poisonous nature of the snakebite with prompt ASV administration results in reduced complications and improved treatment outcomes.

Keywords: Snake bite victim, ASV, Gender.

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Introduction

Snakebite remains an underrated cause of accidental death in modern India, especially in rural India. Snakebite is a common acute medical emergency faced by rural populations in tropical and subtropical countries. In India, there are 216 species of

snakes of which only four are venomous snakes. India is the world's heavily affected region, due to its high population density, widespread agricultural activities, numerous venomous snake species and lack of functional snake bite control programs [1].

Over 2,000 species of snakes are known worldwide, of which around 400 are poisonous. These snakes belong to the families Elapidae, Viperidae, Hydrophiidae and Colubridae [2]. Viper bites are more common than other poisonous snakebites in human beings [3]. Of the different varieties of vipers, the Russell's viper (*Vipera russelli*) commonly inhabits the Southern Asian countries, and the Russell's viper's bite is regarded as an occupational hazard for the farming community. Every year, 50,000 Indians die in 2, 50,000 incidents of snake bite, despite the fact that India is not home for the largest number of venomous snakes in the world, nor is there a shortage of anti-snake venom in the country [4].

It is even more underestimated as people fail to reach out to modern medicine and fall victim to the handful of quacks using traditional healing methods [5]. Also, timely or erroneous identification of the snake species and analysis of bite marks alters the treatment and outcomes [6]. The clinical presentation of snakebite victims also varies with age, size of the patient, the snake's species, number and location of the bite, and the quantity and toxicity of the venom [7]. Based on toxicity, they are categorized as Neurotoxic, Hematotoxic, and locally toxic. Objectives of our study was to evaluate the treatment outcome of snake bite victim in tertiary care hospital, in northern Bihar, India.

Materials & Methods

This present study was conducted in Department of Pharmacology, with the collaboration of Department of Medicine,

Jawahar Lal Nehru Medical College, Bhagalpur, Bihar during a period from January April 2019 to November 2019. Entire subjects/Attendants signed an informed consent approved by institutional ethical committee, of Jawahar Lal Nehru Medical College, Bhagalpur was sought. Data was collected with irrespective of sex by the use of random sampling methods. A total of 50 snake bite victim who were reported in emergency unit of our Medical College enrolled in this study. Patient with diagnosis of envenomation from arthropods, or other animals were excluded.

The information was recorded in a structured Performa from patient bed-head ticket (BHT). The collected information was categorized into type and site of snake bite; time lapsed from the time of bite till the time of hospital admission, clinical characteristics of snake bite, severity, time and quantity of antsnake venom used, outcome in terms of duration of hospitalization, and clinical status at discharge.

Statistical Analysis

Data was analysed by using SPSS software. All data was tabulated, and percentages were calculated. Mean \pm S.D were observed.

Observations

Total 50 snake bite victims with age group 10 to >50 years were enrolled in this study. Most of the cases 32(64%) were males. Females were 18(36%). Most of the victims 20(40%) were in age group of 21-30 years.

Table 1: Age wise distribution of snake bite victim cases.

Age group (years)	No. of victims	Percentage
10-20	12	24%
21-30	20	40%
30-40	9	18%
40-50	7	14%
>50	2	4%

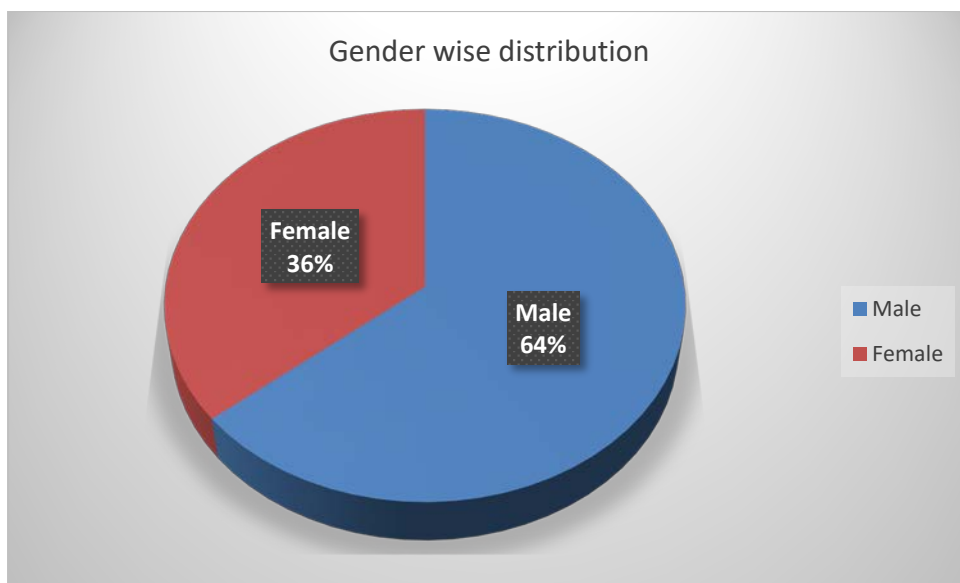


Figure1: Gender wise distributions of snake victim cases.

The most common site of bite was lower limb. Maximum number of cases encountered during May to September of year, reflecting a seasonal disease. That could be because in mansoon season with onset of mansoon rainwater entered the snake pits force them to find refuge elsewhere.

Clinical characteristics of snake bite victim was in range from mild cellulitis 27(54%)

to severe respiratory difficulty 13(26%). Time elapsed from time of bite till the time of hospital admission has been found to play very crucial role in deciding the outcome in case of snake bite. Maximum patient arrival in hospital after the bite was 2-7 hours in our study. Majority 34(68%) of cases were given 10 vials ASV. Only 6(12%) patients were given 20 vials ASV.

Table 2: ASV dose in snake bite victims

ASV dose (Vials)	No. of victims	Percentage
10	34	68%
15	10	20%
20	6	12%

In this presents study, Majorities of the cases 42(84%) were recovered. Only 8(16%) were died due to neurotoxic type of bite. 26% patients need artificial ventilation. Mean duration of hospitalisation for all cases were 6.57±3.12 days.

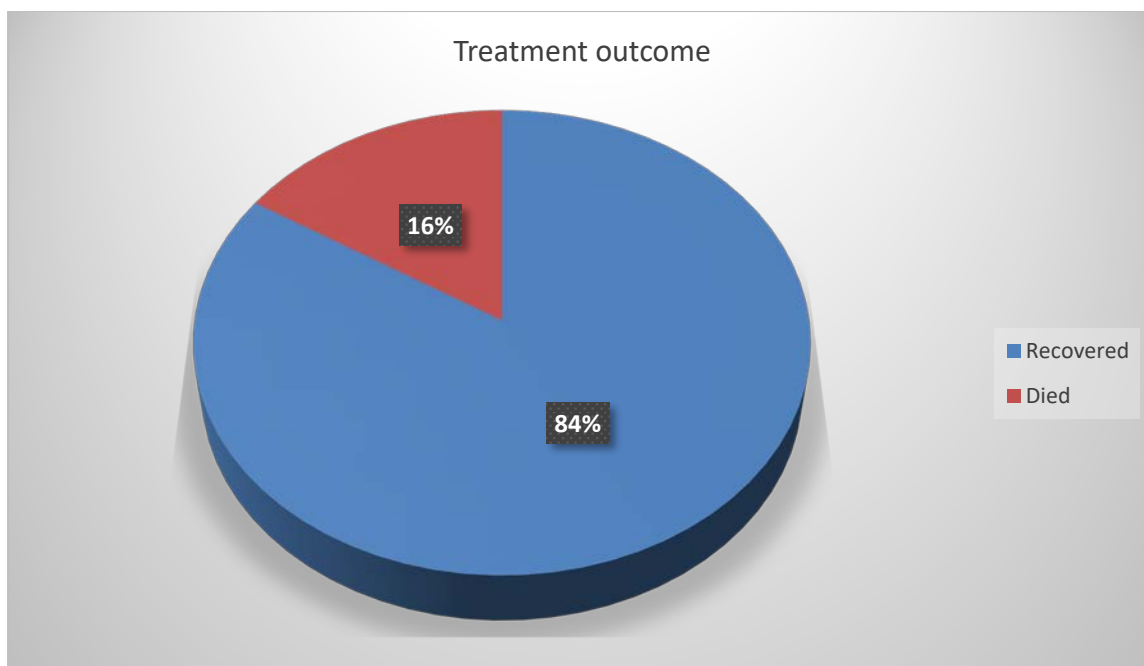


Figure 2: Treatment outcome of snake bite victim.

Discussions

Snake bite is a significant public health problem causing considerable morbidity and mortality worldwide, particularly in the tropics. The mortality due to venomous snakebite in India is estimated between 35,000- 50,000 per annum, which is the Highest in the world according to World Health Organization (WHO) direct estimates [8,9]. The principal effects of envenomation is on the nervous system, kidneys, heart, lungs, liver, blood coagulation system, vascular endothelium and local effects at the site of bite [10].

In this present study, 50 snake bite victim were included. Preponderance of males 32(64%) were more in this study. Most of the cases 20(40%) were belonged in age group of 21-30 years. These observations similar of the study done by Russel et al. [11] Bhat et al. [12] in 1974 reported the incidence as 7:3 (M: F). In the study by Gaurav Bhalla et al [13], out of 150 patients, 99 (66%) patients were male victims, whereas the female victims were 51 (34%) in number. It may be because of more number of male workers working in

the field and were engaged in agriculture and outdoor activities hence prone for exposure to snake bite. The most common site of snake bite was lower limb as lower limb has maximum probability of touching ground whether working or standing or sitting. This finding was also similarly reported by other author[14,15]. At the time of presentation 36(72%) of bite were of vasculotoxic nature followed by 16(32%) % were of neurotoxic nature as observed by Shradha M et al [14], Virendra .C Patil [16], Majority of bite encountered during monsoon season of year i.e from May to September as in most studies like Gimkala et al, and kakaria et al (17) due to flooding of dwelling of snake force them to come out and cause accidental human victimization.

Time elapsed from time of bite till the time of hospital admission has been found to play very crucial role in deciding the outcome in case of snake bite. In this present study, maximum patient arrival in hospital after the bite was 2-7 hours.

In the study done by Gaurav Bhalla et al [13], 76% of neuroparalytic bites got admitted within the first 6 hrs, 52 patients

were admitted within the first 24 hrs but after 6 hrs, among which 15 were vasculotoxic and 4 were neurotoxic. Two neurotoxic bites expired within 1 to 2 hrs after admission.

In this present study, Out of 50 snake bite victims, 27(54%) cases had cellulitis at the site of bite, 24(48%) cases directly presented as bleeding, & 15(30%) cases with ptosis and 13(26%) cases with respiratory difficulty and 11(22%) cases with haematuria which is similar with Virendra C Patil [13]. Virendra. C Patil [18] stated use of ASV in dose range of 15-25 vials and 30 vial & more used in another study [19] dose were 50 and 90 vials in Sharma et al [20] Agarwal et al [21] respectively. This shows gross variation in ASV dose administration and lack of evidence in support to national guideline, which is associated with differential outcome in managing snake bite victims in different region of India.

The anti-snake venoms may be species specific (monovalent/monospecific) or they may be effective against several species (polyvalent/poly specific). As per the recommendations of the WHO, the most effective treatment for snake bite is the administration of monospecific ASV; however, this therapy is not always available for the snakebite victims because of its high cost, the frequent lack of its availability, and the difficulty in correctly identifying the snake. Anti-snake venom (ASV), its rational and timely use is the only definite treatment to neutralize venom in circulation and in tissue fluid to save life in snake bite victim. According to national protocol [22], the recommended initial dose is 10 vials (100 ml) of ASV. If there is no improvement or deterioration in muscle power, this is followed by another 10 vials within 2 h (in all 20 vials. Children should receive same ASV dosage as adult.

In this present study, total dose of ASV administered ranged from 10 to 20 vials, which was in accordance to national

protocol. Majorities of cases 17(34%) were administered 10 vials ASV.

In this present study, outcome of 50 snake bite victim, 42(84%) patients were recovered and 8(16%) died mainly because of respiratory difficulty specially those patients who already brought late with critical conditions. Mean duration of hospitalization in this present study was 6.57 ± 3.12 days.

Snake bite may be termed as an occupational disease, as farmers, plantation workers, herdsmen, hunters or workers on the development sites are mostly affected [18]. Farmers are more prone to accidental contacts with snakes while they work in the field barefooted [23,24].

Conclusions

This present study concluded that the preponderance of snake bite victims is more in younger age male populations. Hence, early hospitalisation with recognition of poisonous nature of the snakebite with prompt ASV administration results in reduced complications and improved treatment outcomes.

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