ORIGINAL RESEARCH PAPER

General Medicine

CORRELATION BETWEEN BITE TO NEEDLE TIME AND COMPLICATIONS IN SNAKE BITES

KEY WORDS: snake bite, envenomation, ASV, complications, durations

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ABSTRACT

INTRODUCTION: The World Health Organization (WHO) estimates that 81,000–138,000 people die each year from snakebites worldwide, approximately half of global snake bite deaths, estimated at 100,000 per year, occur in India. The present study was carried to analyze correlation between the time delay in administering Anti Snake Venom (ASV) in patients with symptomatic evidence of snake bite and subsequent development of complication. MATERIAL: The study was carried out on forty patients admitted with snake bite in the Department of Medicine in Jhalawar Medical College. Detailed clinical history, clinical examination and investigations were carried out. ASV administered in symptomatic patients and bite-to-needle time was noted. And patients were followed for subsequent development of complications. OBSERVATION: Forty patients of snake bites became eligible for the study over a period of 5 months, 15 patients (37.5%) had developed complications while remaining 25 patients (62.5%) were uncomplicated. The Chi square test was used to find the significance of the relationship between the timing of ASV administration after bite due to late arrival at hospital (bite to needle time) with subsequent development of complications. It was found to be significant at 5% level of significance ($p<0.05$) (i.e., $p=0.04$ at degree of freedom 2). **CONCLUSIONS:** In our study we came to a conclusion that the incidence and severity of post snake bite complications is directly proportional to Bite-to-needle time. To prevent this complication and reduce health care burden, timely arrival at health care centres and prompt administration of ASV is encouraged.

INTRODUCTION

India is inhabited by more than 60 species of venomous snakes – some of which are abundant and can cause severe envenoming1. Spectacled cobra (Naja naja), common krait (Bungarus caeruleus), saw-scaled viper (Echis carinatus) and Russell's viper (Daboia russelii) have long been recognised as the most important, but other species may cause fatal snakebites in particular areas, such as the central Asian cobra (Naja oxiana) in the far north-west, monocellate cobra (N. kaouthia) in the north-east, greater black krait (B. niger) in the far north-east, Wall's and Sind kraits (B. walli and B. sindanus) in the east and west and hump-nosed pit- viper (Hypnale hypnale) in the south-west coast and Western Ghats[1&8].

The World Health Organization (WHO) estimates that 81,000–138,000 people die each year from snakebites worldwide, and about three times that number survive and but are left with amputations and permanent disabilities 2. Snakebite deaths and envenomation are largely neglected topics in global health. However, in 2017, the WHO included snakebite envenoming in the priority list of neglected tropical diseases and launched in 2019 a strategy for prevention and control of snakebite, aiming to halve the numbers of deaths and cases of serious disability by 2030 as compared to 2015 baseline. Achieving this goal will require substantial progress in India, which is home to approximately half of global snake bite deaths, estimated at 100,000 per year, occur in India3. As per the Registrar General of India- Million Death Study (RGI-MDS) the number of deaths due to venomous snakebite in India is 46,900 per year. Anti-snake venom (ASV) can prevent many of these complications and death if given in time. However, superstitions, lack of prompt medical access, late reporting to health care system and cost of Anti-snake venom delays the administration of Anti-snake venom.

CASE STUDY

The study was carried out on forty patients admitted with snake bite in the Department of Medicine in Jhalawar Medical College.

Inclusion criteria:

Signs of systemic or local envenomation:

- Haematological envenomation: whole blood clotting time of >20 mins with history of snake bite.
- Neurological envenomation: ptosis, diplopia, dysphagia, dysphonia, muscle paralysis/weakness, respiratory distress, confusion with history of snake bite.

Exclusion criteria:

Persons who did not show any signs of envenomation. the patients who had received anti- snake venom prior to presenting to our institution.

Using the above inclusion and exclusion criteria 40 patients became eligible for the study.

Data collected includes

Clinical history:

Demographic history
Site of bite
Time since bite
symptoms of envenomation and complication.
Through clinical examination:
Vitals
Systemic examination
Local examination of bite site
Examination for signs and complications of envenomation

Laboratory investigations:

- coagulation study (including whole blood clotting time, bleeding time, clotting time, prothrombin time)
- renal function test
- liver function test
- complete blood counts
- urine examination.

Special investigations such as chest X ray and ultrasonography were carried out as and when required.

The patients who presented with signs of envenomation were

administered ASV. The time taken by the patient to arrive at the hospital from the time of bite (i.e. time between the bite and administration of ASV on arrival at our hospital) was noted.

The patients were then prospectively studied to note development of any complications.

The complications observed were:

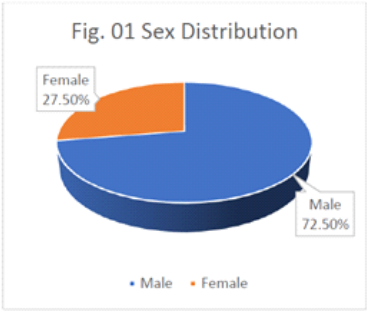
- Acute renal failure (serum creatinine >1.5 mg/dl or oliguria <400ml/day)
- Disseminated intravascular coagulation or primary fibrinolysis
- Compartmental syndrome
- Gangrene
- Cellulitis/necrosis that needed debridement;
- Shock
- Sepsis
- Acute respiratory distress syndrome
- Neurological paralysis requiring ventilatory support.

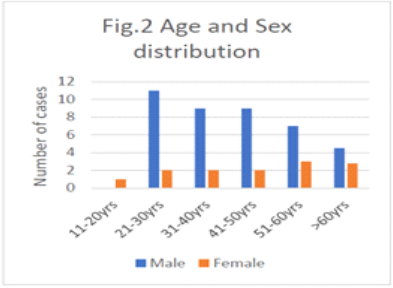
Chi square test was used to study the relationship between the timing of ASV administration (bite-to-needle time) after the snake bite due to late arrival of the patients to the hospital with subsequent development of complications. Further treatment as per complications was given as and when required.

The endpoint of study was normalization of haematological and neurological parameters.

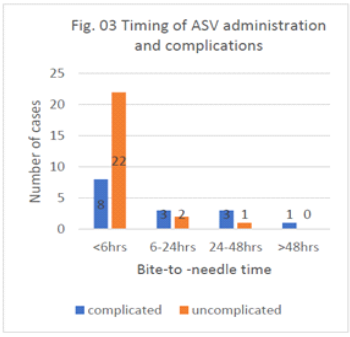
Forty patients of snake bites became eligible for the study over a period of 5 months, 15 patients (37.5%) had developed complications while remaining 25 patients (62.5%) were uncomplicated.

The youngest patient was of 19 years old while the oldest one had age of 75 years. Twenty-nine patients were males (72.5%) while eleven were females (27.5%). Age and sex distribution of cases under study is given in figure 1 and 2.





Out of 40 patients, 15 cases (37.5%) had presented with complications as defined in materials and methods. An attempt was made to study the relationship between the timing of ASV administration after bite due to late arrival of the patient at hospital (bite to needle time) with subsequent development of complications. These findings are summarized in Fig. 3 Chi square test was used to find the significance of this relationship. It was found to be significant at 5% level of significance ($p<0.05$) (i.e. $p=0.04$ at degree of freedom 2).



CONCLUSIONS

In our study majority of patients were found to be males (72.5%) with male to female ratio (3:1), This male preponderance was similar to the findings of most of the Indian studies like Rojnuckarin et al4 had majority of male patients (59%), while Sharma et al 5 had a male to female ratio of 4.25:1, increased risk in males can be attributed to their occupational exposure Majorities of cases were from age group of 21 to 50 years, where most of clustering of case in both genders seen, it would be expected as these people belong to outdoor working group. Increased incidence of complications was seen in those patients who presented late owing to various sociocultural, financial and other factors. Our study Chi-square test was used to find the significance of the same. It was found to be significant at 5% level of significance ($p<0.05$) (i.e., $p=0.04$, at degree of freedom 2). This finding is similar to the observation made by Vijeth SR et al6., JIPMER that the incidence of complications was directly proportional to the duration of venom in the blood prior to neutralization by ASV. In the study by Narencar K.7, J Assoc Physicians India., 2006 Sep;54:717-9 also showed the similar results. In our study we came to a conclusion that the incidence and severity of post snake bite complications is directly proportional to Bite-to-needle time. Various contributary factors like superstitions, unawareness, lack of resources etc. were responsible for the delay in receiving medical care. To prevent these complications and reduce health care burden, timely arrival at health care centres and prompt administration of ASV is encouraged.

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