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Vasculotoxic Snake Bite: Infusion Antisnake Venom Therapy versus Bolus Antisnake Venom Therapy at Tertiary Care Centre

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Abstract **Original Research Article**

The problem of snake bites is widespread throughout the world and particularly in tropical regions. In India, snake bites are found to be one of the leading causes of mortalities and morbidities. According to statistics, approximately 35 000 to 50 000 fatal bites occur every year in India. However, snake bites are usually prevalent in rainy season. Burden of snake-bite has been documented by many investigators recently, with the consequences of snake bite being explored. Identifying chronic impairments and associated socioeconomic costs is an important part of assessing snakebite burden, however, providing significant data on these respect is difficult. ***Aim*****:** To study infusion antisnake venom therapy versus bolus antisnake venom therapy in vasculotoxic snake bite at tertiary healthcare care. ***Material and methods***: The current study was an observational study. During the study, four different anti-snake venom regimens were used to treat patients with vasculotoxic snake bites by comparing clinical manifestations, laboratory investigations, the amount of anti-snake venom required, the incidence of complications, and the outcomes. ***Results*****:** In the present study, demographic data showed significant preponderance of snakebite amongst farmers (n=44). However, the drill was followed by housewives (n=29), students (n=17), teachers (n=4) and shopkeepers (n=3) amongst the reported cases respectively. ***Conclusion***: study concludes that not only proper regimens but also the modality of treatment for the patients of viperine vasculotoxic snake bite is equally important. In order to decrease the morbidity and mortality of snake bite patients, it is imperative to make ASV available universally in areas with high snake bite incidences and to adequately train health care providers about snake bite treatment.

Keywords: Snake-bite, Antisnake, Venom.

INTRODUCTION

Burden of snake-bite has been documented by many investigators recently, with the consequences of snake bite being explored. Identifying chronic impairments and associated socioeconomic costs is an important part of assessing snakebite burden, however, providing significant data on these respect is difficult [1]. Snakebite victims rarely come to the hospital for follow-up care after they are discharged from hospitals subsequently acute complications have resolved, hence the allopathic system never detects long-term disabilities [2].

Snake bite complications can be generally categorized into two main categories based on its site of manifestation: local and systemic. Few local complications associated with vasculotoxic snake bites include necrosis and cellulitis. Whilst systemic complications are coagulopathy, acute renal failure (ARF), and hemolysis [3].

However, bleeding diathesis by viperine envenomation can be successfully reversed only with snake antivenom [4, 5]. Apart from the above mentioned results few other include need of limb amputations, severe disfigurement and psychological disability. Vasculotoxic snakebites cause necrotoxic, neurotoxic and hematotoxic damage to the body, but the mechanisms by which vasculotoxic snakebites result in psychological illness has not been known yet.

Aim

To study infusion antisnake venom therapy versus bolus antisnake venom therapy in vasculotoxic snake bite at tertiary healthcare care.

MATERIAL AND METHODS

The current study was an observational study. During the study, four different anti-snake venom regimens were used to treat patients with vasculotoxic snake bites by comparing clinical manifestations, laboratory investigations, the amount of anti-snake venom required, the incidence of complications, and the outcomes. Study was carried out for 01 January 2021 to 30 June 2022. A total of 100 patients were divided into four groups of 25 each. Group-I - High dose fixed intermittent bolus regime. Group-II - Continuous low dose intravenous infusion. Group-III - Low dose intermittent boluses. Group-IV - High dose intermittent boluses according to severity.

RESULTS

In the present study, demographic data showed significant preponderance of snakebite amongst farmers (n=44). However, the drill was followed by housewives (n=29), students (n=17), teachers (n=4) and shopkeepers (n=3) amongst the reported cases respectively. Maximum patients (n=16) of Group-IV were diagnosed with coagulation dysfunction/whole blood clotting times (WBCT) more than 10 minutes. However, maximum patients (n=17) of group-IV were found to have minimal clotting time (T= <10) after ASV administration.

Table 1: Degree of envenomation

Degree of envenomation	Group-I	Group-II	Group-III	Group-IV
Mild	0 (0)	10 (40%)	9 (36%)	9 (36%)
Moderate	16 (64%)	12 (48%)	10 (40%)	9 (36%)
SEVERE	9 (36%)	3 (12%)	6 (34%)	7 (28%)

Coagulation dysfunction was graded to see the relative requirement of ASV. In the present study the mild degree of envenomation were found 10 (40%), 9(36%) and 9(36%) in group II to IV respectively. However, 0% patient was observed in group I. Moderate degree of envenomation were found 16 (64%), 12 (48%), 10 (40%) and 9(36%) in group I, II, III and IV respectively. Severe degree of envenomation were found 9(36%), 3 (12 %), 6 (34%) and 7(28%) in group I to IV respectively.

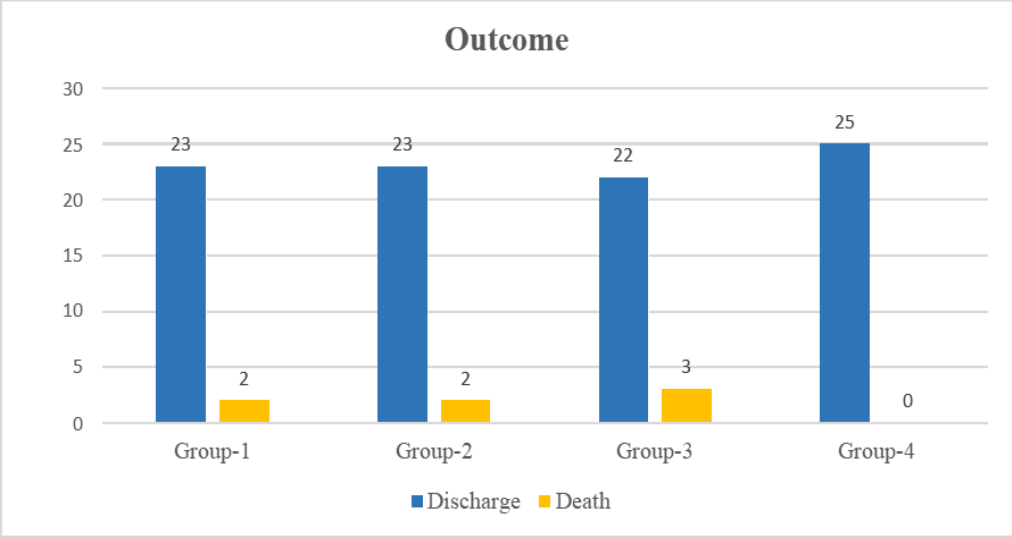

Figure 1: Final outcome of patients

The final results of patients in groups 1 and 2 are shown in table 14 as 2 (8%) and 3 (12%) cases of deaths, respectively, while group 4 shows no deaths.

DISCUSSION

In the present study, demographic data showed significant preponderance of snakebite amongst farmers (n=44). However, the drill was followed by housewives (n=29), students (n=17), teachers (n=4) and shopkeepers (n=3) amongst the reported cases respectively. As found in Pramod Sagar B. K *et al*., [6] these findings are in similar with our findings, who reported that majority of the snakebite cases were either farmers or daily laborers. Maximum patients (n=16) of Group-IV were diagnosed with coagulation dysfunction/whole blood clotting times (WBCT) more than 10 minutes. However, maximum patients (n=17) of group-IV were found to have minimal clotting time (T= <10) after ASV administration.

Coagulation dysfunction was graded to see the relative requirement of ASV. In the present study the mild degree of envenomation were found 10 (40%), 9(36%) and 9(36%) in group II to IV respectively.

However, 0% patient was observed in group I. Moderate degree of envenomation were found 16 (64%), 12 (48%), 10 (40%) and 9(36%) in group I, II, III and IV respectively. Severe degree of envenomation were found 9(36%), 3 (12 %), 6 (34%) and 7(28%) in group I to IV respectively. Envenoming leads to a prolonged prothrombin time owing to decreased fibrinogen and factor V, FVIII and FX levels. (A prolonged APTT (activated partial thromboplastin time) and an increased international normalized ratio (INR) [7].

A metalloproteinase that activates FX and FV results in the procoagulant property of the venom [8]. In spite of ongoing controversy, repeated doses of antivenom (initial dose of 10 or 20 vials) and the use of factor replacements continue to be used. In the present study, we observed that patients need 24–48 hours to recover from coagulopathy [9].

CONCLUSION

The present study concludes that Group –IV showed the most efficient outcome against vasculotoxic snakebite than the other groups. Moreover, patients of group-IV who received higher dose of ASV according to the severity had minimal incidence of complications. This further necessitates that not only proper regimens but also the modality of treatment for the patients of viperine vasculotoxic snake bite is equally important. In order to decrease the morbidity and mortality of snake bite patients, it is imperative to make ASV available universally in areas with high snake bite incidences and to adequately train health care providers about snake bite treatment

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