

A STUDY OF COMPLICATIONS IN SUBJECTS WITH SNAKE BITE IN RELATION TO TIMING OF ASV ADMINISTRATION IN A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND

India is a tropical country, where snake bite is a major public health problem. It is a common occupational hazard mainly in farmers and rural population are affected mainly. India is reported to have highest number of snake bites. Apart from the mortality, the morbidity caused by snake bite is also high in India. Administration of ASV as early as possible can prevent many of the complications and even death if given in time.

The aim of this study is to study the various complications of snake bite in relation to the timing of ASV administration.

MATERIALS AND METHODS

The study was carried out over a period of 8 months by including 50 cases of snake bite. A detailed clinical history regarding bite time since bite, symptoms of envenomation and complications were taken at the time of presentation. Thorough clinical examination was then carried out and also relevant laboratory investigations were sought.

RESULTS

Among these 50 patients, 66% were males and 34% were females. Male preponderance may be attributed to their lifestyles involving outdoor activities and occupational exposures. Majority of the patients were < 30 years of age, 34%. Among the 50 patients 30 had complications, out of these 50% of them had haematological complication, 4% had neurological complications, 28% had renal complication, 4% had cardiovascular complications and 26% had local complications. Those who presented within 6 hours complications were 50% and those who presented late i.e. after 24 hours complication rate was high 100% as we noted in our study.

CONCLUSION

The complication rate was less in those who presented within 6 hours since bite, whereas complication rate was high in those who presented late, though ASV was administered immediately wherever indicated. This implies the importance of early presentation to hospital and initiation of treatment with ASV will prevent the complications in snake bite.

KEYWORDS

Envenomation, Snake Bite, ASV, Complications, WBCT, AKI.

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BACKGROUND

Snake bite is a major health problem in tropical countries like India, where rural population are mainly affected. The true global burden of snake bite is not known due to lack of standardised reporting. However, India is reported to have highest number of snake bites and about 15,000 patients are reported dying every year from venomous snake bites in India.¹ Apart from the mortality, the morbidity caused by snake bite is also high in India. Administration of ASV as early as possible can prevent many of the complications and even death if given in time. However, superstitions, lack of prompt medical access, late reporting to health care systems and cost of ASV delays the administration of ASV.

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Therefore, we are taking this priority area to study the various complications of snake bite in relation to the timing of ASV administration.

MATERIALS AND METHODS

The present study is an observational study and it was carried out over a period of 8 months in our hospital, which is a tertiary care centre and a teaching hospital in the state. All those patients who are > 18 years age and presenting to the casualty department with snake bite were included in the present study and prospectively studied. Snake bite and species identification was confirmed by a reliable history from the patient, those who witnessed the bite and patient's bystanders. All patients were interviewed using a standard questionnaire to maintain a record of patient's history relevant to snake bite envenomation.

In this study, all cases of snake bite ≥ 18 years age who gave informed written consent were included. Those who are < 18 years of age, pregnant patients and those with pre-existing comorbidities like diabetes mellitus, hypertension and ischaemic heart disease are excluded. By going through the above-mentioned inclusion and exclusion criteria, 50 patients were included for the study.

A detailed clinical history regarding bite, time since bite, symptoms of envenomation and complications were taken at the time of presentation. Thorough clinical examination was then carried out. Relevant laboratory investigations like complete blood count, whole blood clotting time, renal function test, liver function tests, prothrombin time, activated partial thromboplastin time, international normalised ratio, random blood glucose and serum electrolytes were done. The time taken by the patient to arrive at the hospital from the time of bite was noted. The patients were then prospectively studied to note the development of any complications.

Haematological envenomation is said to be present if the patient has whole blood clotting time > 20 minutes, thrombocytopenia and deranged coagulation profile. Neurological envenomation was said to be present if the patient has ptosis, diplopia, dyspnoea or respiratory muscle weakness. Local complications like cellulitis, gangrene and compartment syndrome were noted. Oliguria and deranged renal function tests were taken as renal complication.

Statistical Methods

The statistical methods used are descriptive, Chi-square test and cross-tabs (Cramer’s V test).

RESULTS

The study was done on total 50 patients with snake bite who got admitted in our hospital. Among these patients, 66% (n=33) were males and 34% (n= 17) were females.

Male	66%
Female	34%

Table 1. Gender Distribution

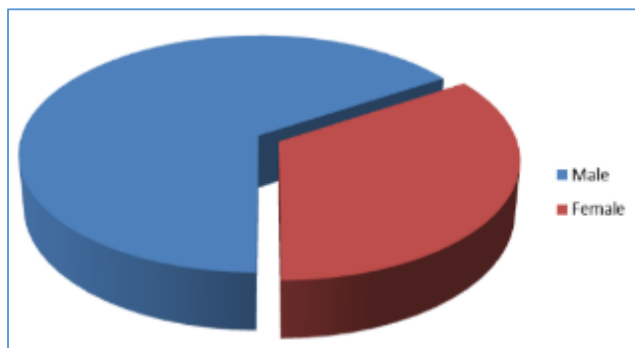


Figure 1. Gender Distribution

Majority of the patients were < 30 years of age 34% (n= 17) and 8% (n= 4) belonged to age > 60 years.

Age in Years	Number
<30	17
31-40	10
41-50	10
51-60	9
>60	4

Table 2. Age Distribution

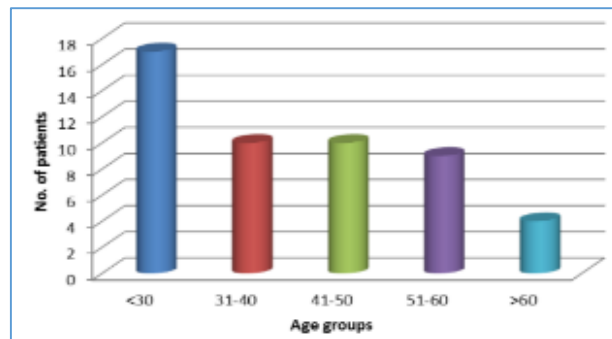


Figure 2. Age Distribution

Among the 50 subjects 30 had complications such that 50% of them had haematological complications, 4% had neurological complications, 28% had renal complications, 4% had cardiovascular complications and 26% had local complications.

WBCT	Cobra	Viper	Krait	Unknown	Total
<20 min	4	1	0	22	27
>20 min	4	7	1	10	22
Not done	0	1	0	0	1
Total	8	9	1	32	50

Table 3. WBCT at Admission in Relation to Type of Snake

(Chi-square test, p value 0.02)

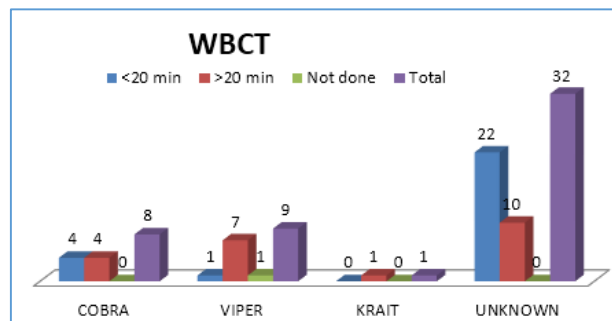


Figure 3. WBCT at Admission in Relation to Type of Snake

Whole blood clotting time is increased in patients with viper bites and unknown bites at presentation, may be because of majority of the unknown bites are poisonous.

Total 14 patients developed AKI, 5 viper bite patients and 9 unknown bite patients developed AKI.

AKI	Cobra	Viper	Krait	Unknown	Total
Yes	0	5	0	9	14
No	8	4	1	23	36

Table 4. AKI in Relation to Type of Snake

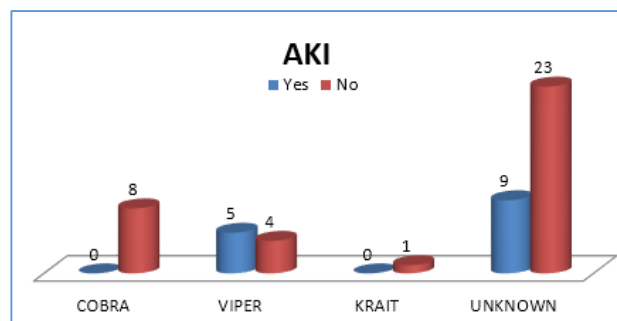


Figure 4. AKI in Relation to Type of Snake

All patients who attended our hospital received treatment without delay. Those who presented within 6 hours, complications noted were 50% and those who presented after 24 hours complication rate was high as 100% as we noted in our study.

Complication	<6 hours	7-12 hours	13-24 hours	>24 hours
No	50%	20%	25%	0%
Yes	50%	80%	75%	100%

Table 5. Complication Rate in Relation to the Time since Snake Bite

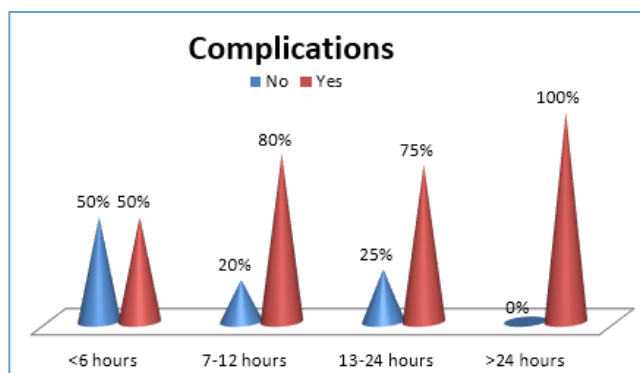


Figure 5. Complication Rate in Relation to the Time since Snake Bite

The number of ASV requirement also depends on type of snake- 3 viper bites, 1 cobra bite and 1 unknown bite required more than 30 vials of ASV in the present study.

Duration since Snake Bite in Hours	Number of Cases Presented	Number of Cases, ASV given	Number of Cases Complicated	Percentage of Cases Complicated
0-6	34	19	17	50%
7-12	5	3	4	80%
13-24	8	7	6	75%
>24	3	0	3	100%

Chi-square test for trend 'p' value is 0.035

Table 6. Administration of ASV in Relation to Duration since Snake Bite and Complications

The number of subjects presented to hospital is more in 0-6 hours and ASV was administered immediately. Among these subjects, 50% of them developed complications. Subjects presented later, though the ASV instituted immediately wherever indicated, the complication rate has increased in relation to the duration since snake bite and ASV administration.

No. of Vials of ASV	Cobra	Viper	Krait	Unknown
NIL	0	2	0	19
1-9	0	0	0	1
10-19	4	2	0	9
20-29	3	2	1	2
>30	1	3	0	1
Total	8	9	1	32

Table 7. ASV Requirement in Relation to Type of Snake

(Chi-square test, p value 0.017)

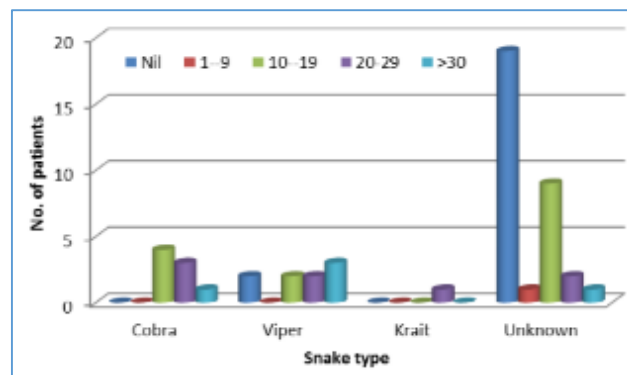


Figure 6. ASV Requirement in Relation to Type of Snake

DISCUSSION

The present study was carried out on 50 cases of snake bite. Male preponderance seen in our study (66%) is in close agreement with earlier studies.^{2,3,4,5} Sharma et al⁴ found 73% males and 27% females in their study and also Brunda et al² found male preponderance of 76%. It may be attributed to their lifestyles involving outdoor activities and occupational exposures,³ while most of the females in our state are usually housewives, thus less prone for snake bites.

It is evident that maximum number of cases belong to <30 years' age group (34%), while only 8% belong to > 60 years. It may be attributed to their lifestyles and occupational exposures. Also, most of the patients in the present study belong to rural areas, which are nearby to Mysore.

	Sharma et al ⁴	Brunda et al ²	Chattopadhyay et al ⁵	Present Study
<30 years	76%	60%	60%	34%
>60years	10%	11%	15%	8%

Table 8. Comparison of Present Study with Other Studies

Among the 50 patients, 30 cases (60%) had variety of complications and the remaining 20 cases did not have any complications. An attempt was made in the present study to find the relationship between the development of complications and timing of ASV administration and other treatment since bite due to late arrival of patient to hospital.

In the present study, 34 cases presented to hospital within 6 hours following bite. Among these 17 cases had complications at the time of presentation, whereas 3 cases presented after 24 hours since bite and all 3 of them had complications. Another 10 cases with complications are presented between 6 - 24 hours since bite. Cramer's V test was employed which showed approximate significance of 0.22 (0.438). Hence, it shows that incidence of complications is directly proportional to the duration of venom in the blood prior to neutralisation by ASV as studied earlier by Vijetha SR et al.⁶ Among the 50 subjects 30 had complications such that 50% of them had haematological complications, 4% had neurological complications, 28% had renal complications, 4% had cardiovascular complications and 26% had local complications.

In the present study 14 patients had AKI and among them only 2 cases went for haemodialysis. These 2 patients presented late as well, i.e. after 24 hours from bite time. A study conducted by Ash et al⁷ and Thomas L et al⁸ documented a positive correlation between severity of renal

failure and increase in time interval between the bite and ASV administration.

Among 8 cases of cobra bite only 2 cases had neuromuscular and respiratory failure and required mechanical ventilator support.

Limitation of the Study

In the present study, the limitation was less number of study subjects.

CONCLUSION

In the present study 30 cases had complications such that 50% of them had haematological complications, 4% had neurological complications, 28% had renal complications, 4% had cardiovascular complications and 26% had local complications.

All patients received treatment without delay. The complication rate was less in those who presented within 6 hours since bite, whereas complication rate was high in those who presented late, though ASV was administered immediately wherever indicated. This implies that importance of early presentation to hospital and initiation of treatment with ASV will prevent the complications in snake bite.

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