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EVALUATION OF SNAKE BITE-TO-NEEDLE TIME AND ITS RELATIONSHIP TO SNAKEBITE MORTALITY AND MORBIDITY

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ABSTRACT

Background: Snakebite is a major environmental and occupational hazard commonly observed in tropical countries. Snakebite is treated with antivenomous, supportive care and wound care. Time is a critical factor in reducing snakebite-related mortality and morbidity.

Objective: The objective of this study was to evaluate the time from bite to needle and its correlation with mortality and morbidity in snakebite subjects.

Methods: Detailed histories were recorded by 200 subjects, including snake bite symptoms, species of snake, location of bite, and time after the snake bite, as well as signs of bleeding, oliguria, respiratory failure, ptosis, cellulitis and level of consciousness. The time from bite to needle was also taken into account. All subjects were administered multivalent snake antivenom. Associated mortality, complications and length of hospital stay were also noted.

Results: The most common snake species involved was the Krait, and the lower limb was the most commonly involved site. ASV was administered to 72 subjects within 6 hours and 30% of subjects within 6-12 hours. Decreased length of hospital stay and complications were observed in subjects with more deaths, length of hospital stay and complications within 24 hours of needle tip, and use of an ASV vial.

Conclusion: Increased systemic envenoming is associated with bite-to-needle time, which further increases the risk of mortality, morbidity and severity of complications. The value of ASV administration and the need for timing should be emphasized in the worm bite.

Keywords: Antisnake venom, complications, bite-to-needle time, mortality, snakebite

INTRODUCTION

Snake bite is a major environmental and occupational hazard in tropical countries and significantly increases mortality. In India, nearly 58,000 deaths are reported every year from snakebite alone. 70 years ago, the risk of death from snakebite in India was one in 250 of the Indian population.[1] Most deaths related to snakebite in India occur between the ages of 20 and

39 years. The potentially fatal consequences of a snake bite are tissue necrosis, muscle paralysis and extensive bleeding. Snake bites have been shown to cause permanent disability, even leading to blindness and amputation. Long-term consequences of snakebite have been reported to include renal failure due to acute kidney injury.[2] Management of snakebites results from early administration of antivenom, supportive care, and wound care. An antivenom is administered first to neutralize the effects of the snake's venom.[3] Despite adequate snakebite control in the United States, snakebite deaths cannot be prevented. In countries like India, snakebite treatment is delayed due to lack of access to health facilities, use of traditional therapies and underreporting of snakebite cases. In India, snakebites are treated with suction of venom from the bite site, use of herbal remedies, incision and tourniquet.[4] The use of these idiosyncratic practices delays appropriate management of issues by health professionals. Delay in administering antivenom to victims is a critical factor in determining snakebite-related mortality and complications.[5] The time from bite to needle is critical in reducing snakebite-related mortality and morbidity. Previous literature studies have been conducted on the mortality and morbidity associated with snakebite.[6] However, further studies are needed to assess the morbidity and mortality resulting from delayed treatment of snakebite. The aim of this study was to evaluate the bite-to-needle time and its association with mortality and morbidity in snakebites.

MATERIALS AND METHODS

The aim of this study was to evaluate the bite-to-needle time and its association with mortality and morbidity in snakebites. The study was conducted by Department of Forensic Medicine and Toxicology after approval to proceed from the relevant ethics committee. The study population was recruited from the outpatient department of the institute after snakebite. Informed consent to participate in the study was obtained from all subjects, both in written and verbal form. A total of 200 people who were cleaned after snakebite were included in the study. After enrolment, a detailed history was recorded for all 200 subjects, followed by a physical examination. A detailed history of blood manifestations, oliguria, respiratory failure, ptosis, abdominal pain, vomiting, cellulitis, bite site pain, level of consciousness, presenting symptoms, stomach type, bite site was recorded in a prestructured sample, and details of the timeline of the snakebite.

A rigorous physical examination of the vasculature was performed for the central nervous system, abdominal, respiratory and cardiovascular systems. WBCT (whole blood clotting time) was also assessed. According to the existing protocol of the institute, snake venom was administered to all 200 subjects. Bite-to-needle time was found in all subjects. The ASV given was a multivalent ASV. The number of ASV vials administered was also recorded. All subjects were carefully monitored for possible complications until discharge. Complications recorded included oliguria 1.5 mg/dL, neurological paralysis, sepsis, shock, cellulitis requiring debridement, gangrene, compartment syndrome, and DIC (disseminated intravascular coagulation) suggestive of AKI (acute kidney injury).Based on the time spent from needle to needle, the subjects were divided into 4 groups. To find out any existing correlation between WBCT outcome, ASV requirement, length of stay, complications and ASV management; we conducted data. The data gathered were assessed statistically using SPSS software version 25.0 (IBM, USA) and the chi-square test. The data were expressed in frequency and percentage and mean and standard deviation. The significance level was taken at $p<0.05$.

RESULTS

Of the 200 individuals in this clinical investigation, 32% (n = 64) were female and 68% (n = 136) were male. 18 out of the 168 participants, or 84% of the total, had 20 minutes. 18% (n=36) of the subjects had no idea what sort of snake was involved, 30% (n=60) had snakes that were poisonous, 12% (n=24) of the study subjects had cobras, and 40% (n=24) of the Krait research subjects had cobras. =80) Research subjects. AKI affected 34% (n=68) of research participants, septic shock affected 12% (n=24) of study subjects, cellulitis affected 50% (n=100) of study subjects, and 10% (n=24) of study subjects had sequelae. =). 20) of academic subjects, 10% (n=20) of study subjects had respiratory failure, and 9% (n=18) of study subjects passed away (Table 2).

The disease occurred in 2 patients of group III and 16 patients of group IV, significant at p = 0.001, and shortness of breath occurred in 12 patients and 6 patients, in both groups, according to the evaluation of the relationship between the results and complications and the needle insertion time after prevention. Subjects 2, 8, and 14 in groups II, III, and IV had p=0.001, whereas subjects 8 and 18 in groups III and IV did not show any significant differences at p = 0.001. In groups I, II, III, and IV, AKI was observed in 8, 16, 20, and 24 individuals, with a significant difference at p = 0.001. Cellulitis occurred in 2, 34, 42, and 22 patients in groups I, II, and III, appeared in III and IV each significant p=0.001.

In groups II, III, and IV of groups 18, 14, and 10, the duration of hospital stay was 10 days, and this difference was statistically significant at p=0.001. Not statistically significant, p = 0.67, a WBCT > 20 minutes was seen in 64, 50, 36, and 18 patients in groups I, II, III, and IV. Ten ASV vessels were given to eight subjects in Group I; twenty vessels were given to 58, 8, and 4 subjects in Groups I, II, and III; six, forty, and eight bottles were given to Group I; each individual received thirty containers for a total of twenty-four individuals. Table 3 indicates that II, III, and IV are significant at p = 0.001.

DISCUSSION

The purpose of this study was to assess how bite time and needle time related to snakebite participants. Of the 200 individuals in this clinical investigation, 32% (n = 64) were female and 68% (n = 136) were male. 9% of the participants (n = 18).

37% (n=74) of research participants had snake bites on their upper extremities, whereas 63% (n=126) had bites on their lower extremity. In 84% of the trial participants (n=168), WBCT lasted longer than 20 minutes. In 18% (n=36) of the cases, the kind of snake involved was unknown, in 30% (n=60) of the subjects, cobras were involved in 12% (n=24) of the study participants, and in 40% (n=24) of the Krait research subjects, cobras were involved. =80) Research subjects. Among the research individuals' outcomes/complications, cellulitis affected 50% (n = 100). The purpose of this study was to assess how bite time and needle time related to snakebite participants. Of the 200 individuals in this clinical investigation, 32% (n = 64) were female and 68% (n = 136) were male. 9% of the participants (n = 18). 37% (n=74) of research participants had snake bites on their upper extremities, whereas 63% (n=126) had bites on their lower extremity. In 84% of the trial participants (n=168), WBCT lasted longer than 20 minutes. In 18% (n=36) of the cases, the kind of snake involved was unknown, in 30% (n=60) of the subjects, cobras were involved in 12% (n=24) of the study participants, and in 40% (n=24) of the Krait research subjects, cobras were involved. =80) Research subjects. Among the research individuals' outcomes/complications, cellulitis affected 50% (n = 100), and patients 2. Occurred in Not significant in p=0.001 in groups II, III and IV, he; DIC in 8 and 18 subjects of groups III and IV, respectively; and septic shock in 2, 8 and 14 subjects of groups II, III and IV, respectively p=0.001. AKI occurred in 8, 16, 20, and 24 patients in groups I, II, III, and IV, significant at p = 0.001, and cellulitis occurred in 2, 34, 42, and 22 patients in groups I, II, and III. appeared in III and IV each significant p=0.001. These results are similar to studies by Harshavardhan L et al13 in 2013 and Gadwalkar S et al14 in 2014, where the authors reported similar results.

As a result of the study, the hospital stay in 10 days in the groups 18, 14 and 10 of the groups II, III and IV, and this difference is significant at p=0.001. A WBCT > 20 minutes was found in 64, 50, 36 and 18 patients in groups I, II, III and IV, not statistically significant, p = 0.67. The total number of ASV vessels administered was 10 vessels for 8 subjects in Group I, 20 vessels for 58, 8, and 4 subjects in Groups I, II, and III, respectively. Examiners of 6, 54 and 40 in Group I;30 containers per person for 24 people. , II, III and IV are significant at p=0.001. These results are similar to the studies of Nigam R et al15 in 2015 and Halesha BR et al16 in 2013.

CONCLUSION

The link findings and issues for needle bite duration match what the authors have said. increased severity of complications and morbidity risk. Snakebite programmes should stress the need of ASV management and when it should be done. Multicenter clinical trials are required, nevertheless.

REFERENCES

1. Mohapatra B, Warrell DA, Suraweera W, Bhatia P, Dhingra N, Jotkar RM, et al. Snakebite mortality in India: A nationally representative mortality survey. PLoS Negl Trop Dis 2011;5:e1018.
2. Suraweera W, Warrell D, Whitaker R, Menon G, Rodrigues R, Fu SH, et al. Trends in snakebite deaths in India from 2000 to 2019 in a nationally representative mortality study. Elife 2020;9:e54076.
3. Mahendra M, Mujtaba M, Mohan CN, Ramaiah M. Study of delayed treatment perspective of snakebites and their long-term effects in a tertiary care hospital in Balgalkot district of Karnataka. APIK J Intern Med 2021;9:153–8.
4. Abubakar SB, Habib AG, Mathew J. Amputation and disability following snakebite in Nigeria. Trop Doct 2010;40:114–6.

5. Suchithra N, Pappachan JM, Sujathan P. Snakebite envenoming in Kerala, South India: Clinical profile and factors involved in adverse outcomes. Emerg Med J 2008;25:200–4.
6. Jarwani B, Jadav P, Madaiya M. Demographic, epidemiologic and clinical profile of snakebite cases, presented to Emergency Medicine department, Ahmedabad, Gujarat. J Emerg Trauma Shock 2013;6:199–202.
7. Kasturiratne A, Wickremasinghe AR, de Silva N, Gunawardena NK, Pathmeswaran A, Premaratna R, et al. The global burden of snakebite: A literature analysis and modeling based on regional estimates of envenoming and deaths. PLoS Med 2008;5:e218.
8. Ahmed SM, Ahmed M, Nadeem A, Mahajan J, Choudhary A, Pal J. Emergency treatment of a snakebite: Pearls from literature. J Emerg Trauma Shock 2008;1:97–105.
9. Narvencar K. Correlation between the timing of ASV administration and complications in snakebites. J Assoc Physicians India 2006;54:717–9.
10. Saravu K, Somavarapu V, Shastry AB, Kumar R. Clinical profile, species-specific severity grading, and outcome determinants of snake envenomation: An Indian tertiary care hospital-based prospective study. Indian J Crit Care Med 2012;16:187–92.
11. Inamdar IF, Aswar NR, Ubaidulla M, Dalvi SD. Snakebite: Admissions at a tertiary health care center in Maharashtra, India. S Afr Med J 2010;100:456–8.
12. Bhalla G, Mhaskar D, Agarwal A. A study of clinical profile of snakebite at a Tertiary Care Centre. Toxicol Int 2014;21:203–8.
13. Harshavardhan L, Lokesh AJ, Tejeshwari HL, Halesha BR, Metri SS. A study on acute kidney injury in snakebite victims in a Tertiary Care Centre. J Clin Diagn Res 2013;7:853–6.
14. Gadwalkar SR, Kumar NS, Kushal DP, Shyamala G, Mohammad MZ, Vishwanatha H. Judicious use of antisnake venom in the present period of scarcity. Indian J Crit Care Med 2014;18:722–7.
15. Nigam R, Kosam D, Debbarma M, Murthy M. Retrospective study of neuroparalytic snake envenomation in a tertiary care hospital of Chhattisgarh. J Evol Med Dent Sci 2015;4:12414–22.
16. Halesha BR, Harshavardhan L, Lokesh AJ, Channaverappa PK, Venkatesh KB. A study on the clinical-epidemiological profile and the outcome of snakebite victims in a tertiary care center in southern India. J Clin Diagn Res 2013;7:122–6.

TABLES

Characteristics	Percentage (%)	Number (n)
Gender		
Females	32	64
Males	68	136
Age range (years)		
<20	9	18
21-30	19	38
31-40	26	52
41-50	20	40
>50	26	52

Table 1: Demographic data of the study subjects

Factor	Percentage (%)	Number (n)
Hospitalization duration		
<5	28	56
5-10	51	102
>10	21	42
Total ASV administered (vials)		
10	4	8

20	35	70
30	61	122
Bite-to-needle time		
<6	36	72
6-12	30	60
12-24	22	44
>24	12	24
Site of the bite		
Upper limb	37	74
Lower limb	63	126
WBCT		
>20 mins	84	168
Snake species		
Unknown	18	36
Viper	30	60
Cobra	12	24
Krait	40	80
Outcome/complications		
Death	9	18
Respiratory failure	10	20
DIC	10	20
Septic shock	12	24
AKI	34	68
Cellulitis	50	100

Table 2: clinical feature of snakebite in the study subjects

Parameter	Group I	Group II	Group III	Group IV	p-value
Outcome/complications					
Death	-	-	2	16	0.001
Respiratory failure	-	12	6	2	0.06
DIC	-	-	8	18	0.001
Septic shock	-	2	8	14	0.001
AKI	8	16	20	24	0.001
Cellulitis	2	34	42	22	0.001
Hospitalization duration					
<5	54	2	-	-	0.001
5-10	18	40	30	14	0.001
>10	-	18	14	10	0.001
WBCT >20 minutes	64	50	36	18	0.67
Total ASV administered (vials)					
10	8	-	-	-	0.001
20	58	8	4	-	0.001
30	6	54	40	24	0.001

Table 3: Correlation of outcome and complications to bite-to-needle time