A STUDY ON CLINICAL PROFILE OF SNAKEBITE VICTIMS IN A SEMIURBAN TERTIARY CARE CENTRE

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ABSTRACT

Snakebite is an important occupational hazard and cause of morbidity and mortality in rural and semiurban areas in Tamilnadu, in spite of which, only few studies have been done. The objective of the study was to study the prevalence of snakebites, their clinical profile, management, in view of better understanding and management of snakebite.

METHODS

This is a descriptive observational study conducted in Intensive Care Unit of Government Chengalpattu Medical College Hospital, Chengalpattu for a period of 2 months (March 2016 - April 2016). Careful history, detailed clinical examination, Whole Blood Clotting Time (WBCT), and routine investigations were taken for all patients of snakebite. Management was as per WHO protocols.

RESULTS

77 patients were included in the study. 62% were men with 71.5% of bites in the lower limb. 79% arrived at the hospital within 6 hours of bite. 71% had signs of envenomation. 72% required ASV of which 23% developed allergy to ASV. 31.5% developed complications and 6.5% of patients admitted with snakebite died.

CONCLUSION

The snakebite patients were predominantly males with majority of them reporting to hospital within 6 hours. The most common clinical feature was cellulitis with majority of patients requiring ASV. In spite of most of the patients reporting to hospital within 6 hours, complication rates and mortality rates are high indicating the need for better education about first aid and need for better facilities for management at the primary healthcare level.

KEYWORDS

Clinical Profile, Snakebite, Semiurban, Tertiary Care.

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INTRODUCTION

Snakebite is an important occupational hazard in rural and semiurban areas in Tamilnadu. In Tamilnadu, common poisonous snakes are Cobra, Russell's viper, Saw Scaled viper, and Krait. Snakebite is an important cause of mortality and morbidity in rural Tamilnadu. In spite of heavy morbidity and mortality, very little attention is paid by the clinicians to this occupational hazard and there is very little research and literature that is available. It was in the year 2009 when WHO included snakebite in the list of neglected diseases⁽¹⁾ treating snakebite victims with anti-snake venom is a specific life saving measure. According to WHO estimate, about 10 million anti-snake venom vials are needed globally, but unfortunately, the global production of anti-snake venom is woefully short of the requirement. WHO has issued guidelines for the management of snakebite and prevention of mortality.⁽²⁾ In spite of all these measures, death due to snakebite is still an important cause of mortality in rural and semiurban Tamilnadu.

AIM

To study the prevalence of poisonous and non-poisonous snakebites cases in rural and semiurban Tamilnadu around the town of Chengalpattu with reference to age, gender, part of body bitten, time window between time of bite and arrival in hospital, and their clinical manifestations, complications, quantity of ASV used, their effectiveness in management, and reducing the mortality rate.

MATERIALS AND METHOD

This descriptive observational study was conducted in Intensive Care Unit of Government Chengalpattu Medical College Hospital, Chengalpattu, which is a tertiary care hospital in the state of Tamilnadu. The study period was 2 months [i.e. March and April 2016]. All patients with definite history of snakebite admitted in IMCU Chengalpattu Medical College were included in this study.

A careful history was obtained with special attention to residing area, age, gender, site of bite, and time interval between snakebite and arrival to hospital. Vitals were recorded. Local examination for cellulitis, bleeding, and fang mark was done meticulously. A detailed systemic examination was carried out in all patients with special attention to signs of systemic envenomation like ptosis, bleeding, and tachycardia was done. As per the WHO protocol, a 20-minute Whole Blood Clotting Time [WBCT] was done on all patients immediately after admission. Routine investigations like Complete Blood Counts [CBC], blood sugar, blood urea, serum creatinine,

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serum electrolytes, and complete urinalysis was done. X-ray and Electrocardiogram [ECG] were taken.

When signs of envenomation like prolonged WBCT of more than 20 minutes, ptosis, or severe local cellulitis was present, an initial dose of 8-10 vials of ASV was given according to WHO protocol. The patients were closely monitored for development of any allergic reactions. If there was any allergy, ASV was stopped and patients were treated with steroids and antihistamines. In severe allergy, inj. adrenaline was given in addition to steroids and antihistamines. Once the allergy settled, patients were cautiously restarted on ASV. The quantity of ASV administered was based on the clinical signs and symptoms of envenomation. A total dose of 28-30 vials was used in patients with severe envenomation. In patients who developed neuroparalysis inj. atropine and neostigmine was given. If there was improvement in symptoms, atropine and neostigmine was continued. If there was no improvement in neurological symptoms after 3 doses of atropine and neostigmine, then it was discontinued. Patients who developed severe neuroparalysis and respiratory failure were given ventilatory support. Patients with rise in blood urea and serum creatinine were initially treated with IV fluids. Patients with rising serum creatinine levels in spite of administration of IV fluids were taken up for haemodialysis. Patients with cellulitis were treated with anti-inflammatory drugs and antibiotics. One patient required surgical management.

RESULTS AND DISCUSSION

There were 77 patients with definite history of snakebite admitted in IMCU during this study period. Of these 55 (71%), patients had signs of envenomation and 22 (29%) patients did not have any features suggestive of toxicity. These 22 patients may have been bitten by non-poisonous snakes or it may be cases of dry bite.

Characteristics	Group	No. of Patients	Percentage
Gender	Male	48	62%
	Female	29	28%
Age distribution	12-20	9	12%
	20-40	28	36%
	40-60	31	40%
	Above 60	9	12

Table 1: Demographic Profile of Patients Studied

The demographic profile of the patients [Table 1] shows that 48 were males and 29 females denoting a significant male preponderance in the ratio 6:4. The increase in incidence among the males can be attributed to their outdoor activities being the main earning members of the family.⁽³⁾ More patients in the age group 40-60 were affected. Similar findings were reported by Harshavardhana et al⁽⁴⁾. Majority (77%) of the patients in the study reported with snakebite in the lower limbs emphasizing the need to create awareness on use of protective footwear among the population. 19% of the victims arrived at the medical centre within one hour from time of bite. 79% of the patients arrived at the hospital within 6 hours of bite. Only 3 patients were brought after 24 hours of which 1 patient expired.

Characteristics			
Snakebite Site	Region of the Body	No. of Patients	Percentage
	Head	2	2.5%
	Upper limb	13	17%
	Trunk	7	9%
	Lower limb	55	71.5%
Time window between snakebite and admission	Lapse of time in hours	No. of Patients	Percentage
	Less than 1 hour	15	19%
	1-3 hours	22	29%
	3-6 hours	24	31%
	6-24 hours	13	17%
	Above 24 hours	3	4%
Signs of envenomation		No. of Patients	Percentage
	Present	55	71%
	Absent	22	29%
Symptoms and signs		No. of Patients	Percentage
	Ptosis	30	39%
	Prolonged WBCT	34	44%
	Bleeding from bite site	17	22%
	Local cellulitis	37	48%
	Haematemesis	2	2.5%
	Haematuria	3	4%
Pattern of envenomation		No. of Patients	Percentage
	Haemotoxic	21	27%
	Neurotoxic	17	22%
	Both haemotoxic and neurotoxic	13	17%
	Cellulitis	37	48%

Table 2: Clinical Profile of Patients Studied

The clinical profile of the patients [Table 2] shows 30 patients had ptosis and other signs of neurotoxicity. Of these 30 patients, 10 needed ventilator support because of drop in oxygen saturation, poor respiratory effort, or respiratory failure.

34 patients had prolonged WHCT at the time of admission. 17 of these patients had bleeding from the site of bite, 3 patients had haematuria, and 2 had haematemesis. 4 of these patients required blood transfusion.

37 patients had local cellulitis and inflammation at the site of bite. These patients were treated with antibiotics and anti-inflammatory drugs. Most of them responded well to treatment. Only, one patient required surgical intervention.

Regarding the pattern of systemic involvement, 21 patients had predominantly haemotoxic symptoms, 17 had neurotoxic symptoms, 13 patients had both haemotoxicity and neurotoxicity, and 37 patients had cellulitis.

Characteristics	Group	No. of Patients	Percentage
Number of ASV vials given	8-10 vials	17	22%
	20 vials	13	17%
	28-30 vials	25	33%
	No ASV used	22	28%
Adverse Reactions to ASV	Mild allergy	11	14%
	Sever anaphylaxis	7	9%
	Total no of patients with allergy to ASV	18	23%

Table 3: Usage of ASV vials

The standard protocols recommended administration of 8-10 vials of ASV.⁽⁵⁾ In our study [Table 3], 17 patients required 8-10 vials of ASV, 13 patients needed 20 vials, and 25 patients required 28-30 vials of ASV. Patients with severe neurotoxicity like respiratory failure and patients with both haemotoxicity and neurotoxicity required 28-30 vials of ASV. A total of 18 patients (32%) developed allergy to ASV. Of these, 11 had mild allergy and rashes while 7 patients had severe anaphylactic reaction. All patients who developed allergy were treated with steroids and antihistamines and patients with anaphylaxis were treated with inj. adrenaline in addition to steroids and antihistamines. All patients responded to treatment and ASV restarted and full dose completed. No death occurred due to ASV allergy.

Characteristics	Group	No. of Patients	Percentage
Clinical outcome	End Result		
	Respiratory failure	10	13%
	Acute kidney injury	4	5%
	Haematuria	4	5%
	Haematemesis	2	2.5%
	Pulmonary oedema	1	1%
	DIVC	2	2.5%
	Stress-induced Hyperglycaemia	2	2.5%
Deaths	Gender	No. of Patients	Percentage
	Male	2	2.5%
	Female	3	4%
	Total	5	6.5%

Table 4: Clinical Outcome

24 patients developed various complications [Table 4]. 10 patients had respiratory compromise and were given ventilator support. Acute kidney injury in the form of rising blood urea and serum creatinine was seen in 4 cases. Of these, 3 cases responded to fluid challenge while one patient required haemodialysis. 4 patients had haematuria, 2 patients had haematemesis, and 2 had Disseminated Intravascular

Coagulation [DIVC]. One patient developed pulmonary oedema. 2 patients who were not a known case of diabetes had stress-induced hyperglycaemia.

Out of these 77 patients, 5 (6.5%) patients expired, which puts the mortality at 6.5% for all snakebites and 9% (Out of 55 cases with signs of envenomation) for snakebites with signs of toxicity. 3 patients were females and 2 males. 2 patients had both haemotoxicity and neurotoxicity while 3 had predominantly neuromuscular and respiratory failure. 2 patients died within half an hour of admission, 1 patient died within 4 hours, and 1 patient in 24 hours. Only one patient had duration of hospital stay for 12 days.

SUMMARY AND CONCLUSION

In the present study, the snakebite patients were predominantly males.⁽⁴⁾ mostly middle-aged between 40-60 years of age and majority of them reporting with snakebite in the lower limb.⁽⁶⁾ Majority of them reported to the medical centre within 6 hours of the time of bite. The most common presentation of envenomation in the patients was local cellulites followed by ptosis and prolonged bleeding from site. Significant number of patients [44%] had prolonged WBCT. The predominant pattern of envenomation includes cellulitis in 48%, haemotoxic 27%, neurotoxic 22%, and both haemo and neurotoxic in 17% of the patients. The usage of ASV vials ranged from no vials used to up to 30 vials used. 23% of the patients reported allergic reactions to ASV and were appropriately treated with adrenaline, antihistamines, and steroids. Among the snakebite patients, 13% developed respiratory failure, 5% acute renal failure, 5% haematuria, 2.5% haematemesis, 5% DIVC. In the present study, there were 5 deaths due to snakebite, 3 males and 2 females.

In India, snakebites are a common cause of morbidity and mortality. Snakebites are well-known medical emergencies. Snakebites are seen most often among agricultural workers and those going to the forest. They are more common during monsoon and post-monsoon seasons.⁽⁷⁾ Most of the snakebite patients belong to the low socio-economic group. The use of traditional first-aid treatment should be discouraged.⁽⁸⁾ The high morbidity and mortality due to snakebites could be attributed to the traditional harmful first-aid measures, lack of proper medical care, and delay in carrying the patient to the nearest healthcare facility for providing appropriate treatment.^{(9),(10)} The emphasis must be on reassurance and immobilisation of the patient and transfer to appropriate medical facility for treatment as per guidelines prescribed by the National Snakebite Management Protocol.⁽¹¹⁾

The brief history from the patient regarding the snakebite, clinical examination for local signs and symptoms like fang marks, local pain, swelling, bleeding from the site, blister formation etc., and constant monitoring of the progression of local and systemic symptoms and signs is mandatory in the management of snakebite victims. The management in hospital involves the care of airway, breathing, circulation, and shock. Identification of type of snake and the time of bite plays a crucial role in determining the progression of impending complications of snakebite like neurotoxic and haemotoxic effects.⁽¹²⁾

Administration of ASV forms the most crucial factor in effective management of snakebite victims. The National Guidelines on usage of ASV in snakebite victims is to be emphasised. The recognition of allergic reactions among the

patients to ASV treatment and the subsequent management of these reactions is important in the treatment of snakebite cases.

Promotion of awareness on first-aid principles in snakebite management, use of protective footwear, early treatment, and monitoring under appropriate medical supervision is the key to effective management of victims of snakebite. The rural and semiurban population must be informed of the recognised medical centres with adequate infrastructure to facilitate appropriate early treatment in order to reduce the morbidity and mortality in snakebite patients.

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