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Original Research Article

Clinical study of scorpion sting envenomation

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ABSTRACT

Background: Scorpion stings are common in India. Presentation of scorpion sting may vary from localised pain at the site of the sting to life threatening condition. Systemic envenomation will even result in death among one third of the subjects. The present study was conducted to determine the clinical presentation, course, complications and outcomes of scorpion sting envenomation among children as they are sensitive to scorpion envenomation.
Methods: 50 cases of scorpion sting, admitted to 2 hospitals, under JJMMC, Davangere for 1 year were included. A detailed clinical history followed by examination was done. Relevant investigations were also done. All the cases were monitored for complications and managed accordingly.
Results: Maximum number of cases were noted in the age group of 1-3 years and 10-12 years. 58% of them were boys, 54% of the cases had red scorpion sting. Pain at the sting site, diaphoresis and restlessness were the most common presenting symptoms. The common signs noted were restlessness, cold extremities and tachycardia. Commonest complications were peripheral circulatory failure, pulmonary oedema, myocarditis and congestive cardiac failure. Majority of cases recovered without any sequelae.
Conclusions: Present study we conclude that majority of the cases were among boys belonged to 1-3year age group. Red scorpion sting was common, and commonest presentation was pain and recovered without any sequelae.

Keywords: Complications, Prognosis, Scorpion sting, Symptoms

INTRODUCTION

Scorpion sting is an acute life threatening emergency common in India.[1,2] There are about 1500 species of scorpions worldwide, of which about 50 are dangerous to man.[2,3] There are 86 species of scorpion in india, out of which, Mesobuthus Tamulus and Palamneus-swammerdami are of medical importance.[2]

Scorpions lives in warm dry regions throughout India and inhabit crevices of dwellings, underground burrows, paddy husk, sugarcane fields, coconut and banana plantations etc with their distribution being more in region with abundant red soil.[2]

In India, Mesobuthus tamulus is the most lethal of all scorpion speces and are found abundantly in Western Maharashtra, Andra Pradesh, Saurashtra, Pondicherry and Tamil Nadu.[4,5] cardiovascular manifestations are particularly prominent after Indian red scorpion envenoming and children are at greater risk of developing severe envenomation.[2,5] Hence the present study was conducted to determine the clinical presentation, course, complications and outcomes of scorpion sting envenomation.

METHODS

All the children admitted for scorpion sting in 2 hospitals attached to JJMMC, Davangere (C G Hospital and

BCHIRC) during the period of one year formed the study subjects.

Based on the inclusion criteria, all cases of definite scorpion sting in children upto 18 years of age in which a scorpion was seen in the vicinity either by the patient or the parents, immediately after the sting and children with history of bite coupled with classic clinical manifestations of scorpion sting were also included in the study.

50 cases of scorpion sting, admitted to 2 hospitals, under JJMMC, Davangere for 1 year from January 2006 to December 2007 were included. Detailed clinical history, including the time of sting, symptoms, description of the scorpion and details of treatment received before admission was taken.

All the patients were subjected to a detailed clinical examination at admission and at frequent intervals thereafter, as was necessary in each case. Hourly monitoring of heart rate, respiratory rate, blood pressure, urine output, cardiovascular and respiratory status was done.

Routine investigations like complete blood counts, peripheral smear, urine routine, bleeding time, clotting time, blood sugar and serum amylase level, was done in all the cases. Chest radiograph was done in cases with evidence of myocarditis or pulmonary oedema. Electrocardiography (ECG) and echocardiography was done in cases with myocarditis and congestive cardiac failure. Computed tomography (CT scan) of the brain was performed in cases with neurological involvement.

All patients who were symptomatic received a dose of prazosin (30mg/kg/dose) at admission. Children with peripheral circulatory failure were treated with prazoin, intravenous fluids, and intravenous diazepam (0.2 mg/kg). Prazosin was repeated every 4 hours, till peripheries became warm and urine output improved. All the cases were closely monitored for complications and managed accordingly.

RESULTS

Maximum number of cases were noted in the age group of 1-3 years and 10-12 years. The youngest case noted was 1 month old infant and the oldest was a 15 year old child (Table 1).

It was also noted that complications were more among younger children in this present study, however the incidence of complications was similar among both boys and girls. 58% of them were boys and 42% were girls. In 54% of the cases it was red scorpion compared to 46% of black scorpion sting. Sting during day time (64%) was more common than night. Majority of the stings were sustained on the extremities.

Table 1: Distribution of study subjects based on their age.

Age	No. of cases	Percentage
0-1month	1	2
1month- 1year	4	8
1-3years	11	22
4-6years	10	20
7-9years	6	12
10-12years	11	22
13-15years	7	14
Total	50	100

Pain at the sting site, diaphoresis and restlessness were the most common presenting symptoms. Pain at the site of sting was the commonest complaint noted and was invariably present in all the cases. The pain was usually mild. Swelling was also noted among 46% of the study subjects, which resolved spontaneously within 24hrs without any complications. Dyspnea was complained by 36%, of whom 11 of them developed pulmonary oedema (Table 2).

Table 2: Distribution of study subjects based on the presenting symptoms.

Symptoms	No. of cases	Percentage
Pain at the site of sting	50	100
Salivation	19	38
Diaphoresis	44	88
Vomiting	28	56
Swelling	23	46
Dyspnoea	18	36
Pain abdomen	3	6
Fever	1	2
Restlessness	40	80
Altered sensorium	3	6
Convulsion	1	2

Table 3: Distribution of study subjects based on the presenting signs.

Signs	No. of cases	Percentage
Restlessness	40	80
Cold extremities	36	72
Tachycardia	32	64
Bradycardia	2	4
Cyanosis	5	10
Tachypnea	11	22
Priapism	7	14
Hypertension	3	6
Hypotension	33	66
Altered sensorium	3	6
Left sided hemiparesis	1	2

The common physical signs noted were, restlessness, cold extermities, tachycardia with hypotension and

tachypnea. Priapism was noted in 14% and 6% had hypertension. 72% of cases presented with autonomic storm, characterised by cold extermities, tachycardia and hypotension (Table 3).

Complications were noted in 72% of the cases, most of it being related to the effects of autonomic storm. Peripheral circulatory failure was the commonest complication encountered and is a consequence of fluid loss in the initial cholinergic storm and also secondary to myocarditis. Myocarditis was noted in 16% of the cases. All the cases had ECG abnormalities in the form of ST inversion/ elevation and /or T wave abnormalities. Echocardiography was done in these cases and 5 of them had abnormalities like, decreased LV ejection fraction and/ or LV dilatation, suggesting LV systolic dysfunction (Table 4).

Table 4: Distribution of study subjects based on the complications.

Complications	No of cases	Percentage
Peripheral circulatory failure	36	72
Myocarditis	8	16
Congestive cardiac failure	8	16
Pulmonary oedema	11	22
Encephalopathy	3	6
Popliteal artery thrombosis	1	2
Cerebral infarct	1	2

The immediate short term prognosis was studied in the 50 cases, till they were discharged. A majority of cases recovered without any sequelae. Two cases expired within hours of admission, due to massive pulmonary oedema. One child, who developed popliteal artery thrombosis, 72 hours after the sting, had residual foot drop on the left side and 1 child with right sided cerebral infarct had left sided hemiparesis on discharge.

Table 5: Distribution of study subjects based on the prognosis.

Prognosis	No of cases	Percentage
Recovered	46	92
Residual foot drop	1	2
Left hemiparesis	1	2
Expired	2	4
Total	50	100

DISCUSSION

Scorpion sting is an acute life threatening, time limiting medical emergency of villages. Numerous envenomation go unreported and the true incidence is not known.[2] Dominant clinical effects vary from species and from one geographical location to another.[4] case fatality rates vary widely among different regions from 3-22% and over the years, with improvement in management protocols, there has been a dramatic reduction in mortality.[2] We studied 50 cases of scorpion sting, admitted to 2 hospitals under JJMMC, Davangere from 2006-07.

Based on the age distribution the proportion of cases in the age group 0-3years, 4-6years, 7-12 years and beyond 13 years were 32%, 20%, 34% and 14% respectively. Mahadevan S in 1981, reported a series of 100 cases of children with scorpion sting and reported similar age distribution.[6] Children aged between 6-12 years are more exploratory and tend to wander outside homes in the darkness and hence are more susceptible to stings.[4] We did not encounter any case aged more than 15 years. Studies in the past have also shown that most of the admissions for scorpion sting, in pediatric departments are in children between 1-10years of age.[7]

There was a male preponderance in the cases studied by us. This has also been noted in the past by various authors.[6,8,9] This could be because boys, especially toddlers, tend to be more exploratory and wander outside. Scorpion stings, much like snake bites are occupational hazards for the rural population.[10]

Stings due to Mesobuthus species were slightly more common than those due to palamneus species. This preponderance of stings due to red scorpion is reported in the past.[11,12] Further, scorpion of this species being more venomous, could result in increased rates of hospitalisation in children with stings due to this species.[4]

Based on the presenting symptoms, pain at the site of sting was the commonest complaint noted and was invariably present in all the cases. The pain was usually mild. The high incidence of pain was also noted in previous studies.[4,13] local swelling was complained by 46% in this study and resolved spontaneously within 24hours, without any complications. The reported incidence of local swelling has been relatively rare in Indian literature.[2,13]

Central nervous system manifestation are infrequently encountered in India. The incidence of CNS manifestations reported in India vary from 3% to 7%.[6,13]

Based on physical signs, hypertension was noted in 6% of cases. Incidence of hypertension in scorpion stings in Indian studies varies from 12.6% to 29% and hypertension is seen usually within 4-8 hours after the sting.[13]

Complications were noted in 72% of the cases, with most of the complications being related to the effects of autonomic storm. Peripheral circulatory failure was the commonest complication encountered and is a consequence of fluid loss in the initial cholinergic storm and also secondary to myocarditis.[2] High incidence of

peripheral circulatory failure, ranging from 56-80% has been noted in various case series in India.[6,13]

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