

# Study of clinical profile of scorpion sting at PICU RIMS teaching hospital Raichur

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## Abstract

**Background:** Scorpion sting envenomation are real threats in children of tropical and subtropical zones of world including India. It may be life threatening in children, if left untreated. Children are at greater risk of developing severe envenomation. Clinical manifestations include vomiting, profuse sweating, pulmonary edema and death. Present study was taken up to study various complications of scorpion sting, its management and outcome. **Material and Methods:** Present study was single-center, prospective, observational study conducted in cases of definite scorpion sting in children up to 14 years of age in which a scorpion is seen in the vicinity either by patient or the parents immediately after the sting and children with history of sting coupled with classic clinical manifestations of scorpion. Statistical analysis was done using descriptive statistics with help of Microsoft excel sheet. **Results:** During study period total 54 children were admitted for scorpion sting at our tertiary hospital. Most of children were 1-3 years age group (44.4 %), followed by 3-6 years age group (20.4 %). Boys (64.8 %) were more than girls (35.2 %). Most children were from rural background (72.2 %), scorpion sting during night time (66.7 %), on lower limbs (63 %). In present study common local signs were local pain (94.4 %), Redness (85.2 %), Swelling (48.1 %), Itching (29.6 %) and Numbness (20.4 %). Systemic signs/symptoms were Cold extremities (74.1 %), Sweating (79.6 %), Tachycardia (38.9 %), Hypotension (35.2 %), Hypertension (11.1 %) and Altered sensorium (7.4 %). 41 patients required prazosin, most of them received prazosin within 6 hours of scorpion sting (57.4 %). All children recovered well without any serious morbidity or mortality. Complications noted in study patients were peripheral circulatory failure (13.0 %), Myocarditis (5.6 %), pulmonary edema (1.9 %) and Thrombosis (1.9 %). **Conclusion:** Scorpion sting envenomation in children is a common medical emergency among children which requires early hospitalization, early administration of prazosin, close monitoring and good supportive care for good outcome.

**Keywords:** Scorpion sting envenomation, children, Prazosin, medical emergency

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## INTRODUCTION

Scorpion sting envenomation are real threats in children of tropical and subtropical zones of world including India. It may be life threatening in children, if left untreated. The annual number of scorpion stings exceeds 1.2 million with 2.3 billion population at risk.<sup>1</sup> Children are at greater risk

of developing severe envenomation. Clinical manifestations include vomiting, profuse sweating, pulmonary and death.<sup>2</sup> Envenomation by scorpions can result in a wide range of clinical effects, including cardiotoxicity, neurotoxicity, and respiratory dysfunction. Furthermore, the specific treatment that is scorpion antivenom is not available in this region indicating the seriousness of the problem. If not managed early and appropriately, can lead to high mortality. The severity of scorpion sting varies with the scorpion species, age and size and is much greater in children owing to their lesser body surface area. Present study was taken up to study various complications of scorpion sting, its management and outcome.

## MATERIAL AND METHODS

Present study was single-center, prospective, observational study conducted in department of pediatrics, at Raichur Institute of Medical Sciences, Raichur, India. Study duration was of 2 years (1<sup>st</sup> December 2018 to 30<sup>th</sup> November 2020). Study was approved by institutional ethical committee.

### Inclusion criteria

- All cases of definite scorpion sting in children up to 14 years of age in which a scorpion is seen in the vicinity either by patient or the parents immediately after the sting.
- Children with history of sting coupled with classic clinical manifestations of scorpion.

### Exclusion criteria

- Cases of scorpion sting in patients more than 15 years of age.

- Unknown bites and cases where the clinical manifestations are not compatible with scorpion sting.

Written consent was taken from parents for participation in participation in study.

Children below the age of 14 years admitted with history of scorpion sting in paediatric emergency ward were considered in the study. Each patient underwent detailed history and clinical evaluation, relevant investigations (hemoglobin, TC, DC ,ESR, random blood sugar, serum electrolytes, blood urea, serum creatinine, urine routine, chest x ray and electrocardiography), Management was done according to standard PICU guidelines and outcome was assessed.

Statistical analysis was done using descriptive statistics with help of Microsoft excel sheet.

## RESULTS

During study period total 54 children were admitted for scorpion sting at our tertiary hospital. Most of children were 1-3 years age group (44.4 %), followed by 3-6 years age group (20.4 %). Boys (64.8 %) were more than girls (35.2 %). Most children were from rural background (72.2 %), scorpion sting during night time (66.7 %), on lower limbs (63 %).

**Table 1: Demographic data**

Characteristics	No. of cases (n=54)	Percentage
Age		
1 month–1 year	2	3.7
1 year–3 years	24	44.4
3 years–6 years	11	20.4
6 years–9 years	10	18.5
9 years–12 years	7	13.0
Gender		
Male	35	64.8
Female	19	35.2
Residence		
Rural	39	72.2
Urban	15	27.8
Time of sting		
Day	18	33.3
Night	36	66.7
Site of sting		
Face and scalp	1	1.9
Trunk	3	5.6
Upper limb	16	29.6
Lower limb	34	63.0

In present study common local signs were local pain (94.4 %), Redness (85.2 %), Swelling (48.1 %), Itching (29.6 %) and Numbness (20.4 %). Systemic signs/symptoms were Cold extremities (74.1 %), Sweating (79.6 %), Tachycardia (38.9 %), Hypotension (35.2 %), Hypertension (11.1 %) and Altered sensorium (7.4 %).

**Table 2: Signs and symptoms**

Characteristics	No. of cases (n=54)	Percentage
Local		
Local pain	51	94.4
Redness	46	85.2
Swelling	26	48.1

Itching	16	29.6
Numbness	11	20.4
Systemic		0.0
Cold extremities	40	74.1
Sweating	43	79.6
Tachycardia	21	38.9
Hypotension	19	35.2
Hypertension	6	11.1
Altered sensorium	4	7.4
Pulmonary edema	1	1.9

41 patients required prazosin, most of them received prazosin within 6 hours of scorpion sting (57.4 %).

**Table 3:** Sting prazosin time interval

Sting prazosin time interval (hours)	No. of cases (n=54)	Percentage
<6	31	57.4
6–10	4	7.4
11–14	3	5.6
14–18	2	3.7
19 h and above	1	1.9

All children recovered well without any serious morbidity or mortality. Complications noted in study patients were peripheral circulatory failure (13.0 %), Myocarditis (5.6 %), pulmonary edema (1.9 %) and Thrombosis (1.9 %).

**Table 4:** Complications

Complications	No. of cases (n=54)	Percentage
Peripheral Circulatory Failure	7	13.0
Myocarditis	3	5.6
Pulmonary edema	1	1.9
Thrombosis	1	1.9

## DISCUSSION

Scorpion sting is a major public health problem in many tropical and subtropical countries. The clinical manifestations of scorpion sting envenomation are due to a massive release of sympathetic and parasympathetic neurotransmitters.<sup>3,4</sup> The local symptom of scorpion sting includes pain at the site of sting (most common), followed by redness, swelling, itching, and numbness. The common systemic signs include cold extremities, sweating, and tachycardia. Rajniti Prasad *et al.*,<sup>5</sup> studied 90 children admitted with scorpion sting envenomation. Most of them had sting over extremities except two, having over the trunk. Common clinical signs were shock (53.3%), myocarditis (42.2%), encephalopathy (35.5%), pulmonary edema (37.8%) and priapism (31.1%). Eight (8.9%) children had died. Mortality was significantly higher in children presented after 6 hours of bite. Patients, who had metabolic acidosis, tachypnea, myocarditis, APE, encephalopathy and priapism had significantly higher mortality. Jagannathan H *et al.*,<sup>6</sup> studied 159 children, and noted that common age group as 2-6 years (44.5%), males (63%), nocturnal bites (53.8%), lower limb bites (52.2%), pain (33.8%), admission within 2 hours (81.25%), pre-hospital treatment (28.7%) class I symptoms (43%) and ECG changes in (11.3%) and 89.3% received prazosin were common findings. Similar findings were noted in

present study. Univariate analysis identified abnormal heart rate, S3 gallop, cold extremities, weak pulse, prolonged capillary refill time, abnormal systolic blood pressure and ECG changes as significant risk factors for prolonged hospital stay.<sup>6</sup> In the study conducted by Bosnak M *et al.*,<sup>7</sup> from turkey, the mean age of the patients was 6.1 +/- 4.1 years, male to female ratio was 1.8. The most common sting localization was the foot-leg (55.6%). The mean duration from the scorpion sting to hospital admission was 4.5 +/- 2.6 hours. The most common findings at presentation were cold extremities (95.5%), excessive sweating (91.1%) and tachycardia (77.7%). The mean leukocyte count, and serum levels of glucose, lactate dehydrogenase, creatine phosphokinase and international normalized ratio were found above the normal ranges. Prazosin was used in all patients, dopamine in 11 (24.4%) and Na-nitroprusside in 4 (8.8%) patients. Two children died (4.4%) due to pulmonary oedema. Early and effective prazosin therapy, good supportive care, close monitoring and management of complications can limit the resulting morbidity and mortality significantly.<sup>8</sup> Prazosin, a postsynaptic alpha-1 blocker, counteracts the effects of excessive catecholamines, arrests the development of severe systemic features and found to be an effective drug for scorpion sting envenomation. It has reduced the mortality rate to 1% as compared with a 30% mortality rate

in the pre-prazosin period.<sup>9</sup> Studies by Ramesh Pol<sup>10</sup> and Biswal N<sup>11</sup> have showed that children who presented after 6 hours of the sting had a significantly higher mortality rate (7.5%). In present study, no mortality or severe complications were encountered since all the children in the study group were admitted within 6 hours. Narayanan P *et al.*<sup>12</sup>, studied effect of nitroglycerine infusion in children hospitalized for scorpion sting with severe myocardial dysfunction and decompensated shock. they concluded that nitroglycerine therapy could bring about significant improvement in myocardial function and hemodynamic parameters with a potential for improved survival. Major limitations of present study were small sample size, observational, single center study.

## CONCLUSION

Scorpion sting envenomation in children is a common medical emergency among children which requires early hospitalization, early administration of prazosin, close monitoring and good supportive care for good outcome.

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