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Original Research Article

A STUDY OF CLINICAL PROFILE, MANAGEMENT AND OUTCOME IN PAEDIATRIC PATIENTS ADMITTED WITH SCORPION ENVENOMATION IN TERTIARY CARE CENTRE

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ABSTRACT

Background: Scorpion envenomation remains a significant paediatric emergency in India. Children are at higher risk of severe manifestations due to autonomic storm and cardiovascular involvement. Early recognition and prompt administration of Prazosin have been shown to improve outcomes. The objective is to study the clinical profile, severity, management, complications, and outcomes of paediatric patients admitted with scorpion sting envenomation in a tertiary care centre in Maharashtra.

Materials and Methods: This prospective observational study was conducted over a two-year period (January 2024-December 2025) at a tertiary care hospital. All children aged ≤14 years admitted with a definite history of scorpion sting were included. Clinical features, severity grading as per Abroug's classification, management strategies, complications, electrocardiographic changes, and outcomes were recorded and analysed.

Results: A total of 46 children were included in the study. There was a male predominance (male:female = 1.4:1). The majority of cases occurred during October and November. The most affected age group was 6 to 10years (39.13%). Pain at sting site (89.13%), diaphoresis (52.17%), and restlessness (52.17%) were the common presenting symptoms. Tachycardia (67.39%) and hypertension (36.95%) were the predominant signs. According to severity grading, 34.78% had Grade I, 52.17% Grade II, and 13.04% Grade Ill envenomation. Prazosin was administered within 6 hours in 54.34% of cases. Peripheral circulatory failure (26.08%) and myocarditis (13.04%) were the most common complications. ECG abnormalities were seen in % of patients, with sinus tachycardia being the most frequent. There was no mortality in the study.

Keywords: Prazosin, scorpion sting

INTRODUCTION

Scorpion envenomation is a common medical emergency and an important public health hazard in India. There are about 1500 species of scorpions worldwide. The Mesobuthus tamulus red scorpion) and Palamneus gravimanus (black scorpion) are of medical importance.[1]

Scorpions live in warm dry regions and they are nocturnal arachnids. They emerge only at night, thus most stings are reported at night.[2]

The venom is haemolytic or neurotoxic. Its toxicity is more than that of snakes, but only a small quantity is injected. The venom vesicle is surrounded by a striated muscular layer which regulates the ejection of venom; thus the sting can be complete, partial or dry.[3]

Cardiovascular manifestations are particularly prominent after Indian red scorpion envenoming and children are at greater risk of developing severe envenomation. The venom contains numerous free amino acids, serotonin, hyaluronidase and various enzymes that act on trypsinogen. The toxin acts by opening sodium channel at presynaptic nerve terminals and inhibit calcium dependant potassium channels. Autonomic storm is thus initiated. Alpha

receptor stimulation results in hypertension, tachycardia, myocardial dysfunction, pulmonary oedema and cool extremities. Direct effect of toxins on neurons can contribute to seizures and encephalopathy.[4] Hence the present study was conducted to determine the clinical presentation, course, complications and outcomes of scorpion sting envenomation in children admitted in our tertiary care hospital in Maharashtra.

Aims and Objectives: To study the Clinical Profile, Course, Complications and to Determine the Outcomes of Scorpion sting envenomation in children admitted in our tertiary care hospital in Maharashtra

MATERIALS AND METHODS

Study design: Observational prospective

Inclusion criteria

All patients up to 14 years of age coming to ward/ Picu with history of scorpion sting over a period of two years (January 2024 to December 2025)

Exclusion criteria

Unknown bite, history of any chronic disease

Methods: Patients up to 14 years of age coming with history of scorpion sting over a period of two years were included in this study.

Demographics: Age, sex, time of sting, site of sting, details of pre-hospital treatment Clinical details-symptoms like pain ai sting site, sweating, vomiting, altered sensorium. Parameters like heart rate, presence or absence of S3 gallop, peripheral pulse character, capillary refill time, blood pressure, respiratory rate, priapism at the time of admission were noted.

Abroug's classification of severity of scorpion envenomation was used

Severity Class I: Local symptoms;

Severity Class II: Thrill, Hypersudation, nausea, vomiting, diarrhoea, hypertension and priapism

Severity Class III: Cardiovascular and/or respiratory and/or neurological symptoms.[5]

All symptomatic patients were given Tab. Prazosin at a dose of 30microgram/kg/dose at admission and repeated every four hours targeting warm peripheries and adequate urine output. Myocarditis was treated with Prazosin, Dobutamine infusion. Pulmonary edema was treated with furosemide and mechanical ventilation. Pain at the sting site was treated with NSAIDs, local Lignocaine and cold compress.

RESULTS

During the study period 46 children were admitted to ward and Picu at our tertiary care centre with scorpion sting.

Table 1: Age-wise distribution

Age	Number	Percentage
Up to 1 year	3	6.52%
2 to 5 years	17	36.95%
6 to 10 years	18	39.13%
More than 10 years	8	17.39%
Total	46	100%

Table 2: Sex wise distribution

	Number	Percentage
Males	27	58.69%
Females	19	41.3%
Total	46	100%

Table 3: Time of bite

	Number	Percentage
Day time	14	30.43%
Night time	32	69.57%
Total	46	100%

Table 4: Month wise distribution (January 2024 to December 2025)

	Number	Percentage
January	0	0%
February	2	4.34%
March	3	6.52%
April	2	4.34%
May	5	10.86%
June	5	10.86%
July	4	8.69%
August	3	6.52%
September	6	13.04%
October	7	15.21%
November	7	15.21%
December	2	4.34%
Total	46	100%

Table 5a: Clinical Profile of Scorpion Envenomation (symptoms)

	Number	Percentage
Pain at site	41	89.13%
Profuse sweating	24	52.17%
Restlessness	24	52.17%
Palpitations	19	41.30%
Pain in Abdomen	15	32.60%
Vomiting	14	30.43%
Cough, Dyspnea	8	17.39%
Blurring of vision	1	2.17%
Altered sensorium	1	2.17%

Table 5b: Clinical profile (signs)

	Number	Percentage
Tachycardia	31	67.39%
Hypertension	17	36.95%
Cold peripheries	12	26.08%
Hypotension	8	17.39%
Bradycardia	8	17.39%
Priapism	6	13.04%
Encephalopathy	1	2.17%
Abdominal tenderness	0	0%

Table 6: Prevalence of various grades of Envenomation Severity (Abroug's classification)

	Number	Percentage
Grade 1	16	34.78%
Grade 2	24	52.17%
Grade 3	6	13.04%

Table 7: ECG changes

	Number	Percentage
Sinus tachycardia	31	67.39%
ST - T changes	7	15.21%
PVC	2	4.34%

Table 8: Treatment given

	Number	Percentage
Dobutamine	7	15.21%
Prazosin in less than 6 hours	25	54.34%
6 to 12 hours	14	30.43%
12 to 24 hours	2	4.34%
More than 24 hours	0	0%

Table 9: Complications

	Number	Percentage
Peripheral circulatory failure	12	26.08%
Myocarditis	6	13.04%
Congestive cardiac failure	5	10.86%
Pulmonary edema	1	2.17%
Encephalopathy	1	2.17%

Table 10: Outcome

	Number	Percentage
Recovery	46	100%
Death	0	0

During the study period, 46 children were admitted to ward and Picu at our tertiary care centre with scorpion sting (n=46). There was a Male predominance noted with a male: female ratio of 1.4: 1.

The peak incidence was noted in the months of October and November. The peaks noted in the age distribution pattern at 6 to 10years category (39.13%) and the other at 2 to 5 years category (36.95%) followed by 17.39% for >10 years age.

Pain at the Sting site (89.13%), diaphoresis (52.17%) and restlessness (52.17%) were the most common presenting symptoms. The common physical signs noted were tachycardia (67.39%) and hypertension (36.95%). Priapism was noted in 13.04% of cases. With regard to severity 52.17% in grade 2, 34.78% in grade I, and 13.04% in grade 3 severity were noted.

54.34% of children received first dose of Prazosin within 6 hours and only 4.34% of children in the study group received first dose of Prazosin between

12 to 24 hours of sting and no patient in the study has received the first dose of Prazosin after 24 hours.
Commonest complication was peripheral circulatory failure (26.08%) followed by myocarditis 13.04%
ECG changes were noted in 31 cases, with sinus tachycardia being the commonest finding (67.39%).
There was no mortality due to scorpion sting during the study period.

DISCUSSION

Scorpion envenomation remains a significant paediatric emergency in India, with children being particularly vulnerable to severe autonomic and cardiovascular toxicity. Despite well-established management protocols, morbidity continues to occur, highlighting the need for contemporary, region-specific outcome data.

The predominance of male patients and the higher incidence of stings during night-time and post-monsoon months are consistent with earlier Indian studies and reflect environmental exposure patterns and nocturnal scorpion behaviour.[6-8] The peak incidence in children aged 6–10 years underscores increased mobility and outdoor activity as important risk factors, emphasizing the need for targeted preventive strategies.

Autonomic manifestations dominated the clinical presentation, with pain at the sting site, diaphoresis, and restlessness being common early features. Cardiovascular involvement was frequent, with tachycardia and hypertension as the predominant signs, reflecting catecholamine excess induced by scorpion venom. More than half of the patients had Grade II envenomation, while a notable proportion developed severe (Grade III) disease, reinforcing the potential for rapid clinical deterioration in children.

Over half of the patients received Prazosin within 6 hours of sting, and none received it beyond 24 hours. This timely intervention likely contributed to the favourable outcomes observed. Several studies from endemic regions of India have shown that prompt recognition and early initiation of Prazosin therapy are associated with rapid clinical improvement and favourable outcomes, with mortality rates decreasing considerably over the past few decades. However, delayed presentation, severe cardiovascular complications, and younger age remain important predictors of poor outcome in pediatric patients.[9,10]

The findings underscore that scorpion sting–related deaths are largely preventable with early recognition, prompt Prazosin therapy, and appropriate supportive care. The study reinforces Prazosin as the cornerstone of management and demonstrates that adherence to standardised protocols can result in excellent outcomes.

CONCLUSION

Scorpion envenomation remains an important cause of acute paediatric morbidity in India. Early recognition, prompt administration of Prazosin and timely supportive care are associated with favourable clinical outcomes and significant reduction in complications and mortality among affected children.

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