

A Study on clinical profile & efficacy of prazosin in scorpion sting envenomation in Children.

Dr Amit Kumar¹, Dr B.B.Singh², Dr Ravindra Kumar², Dr Sushil Bhusan³

1. Senior Resident, Department of Pediatrics, Anugrah Narayan Magadh Medical College & Hospital, Gaya.
 2. Associate Professor, Department of Pediatrics, Anugrah Narayan Magadh Medical College & Hospital, Gaya.
 3. Professor & Head, Department of Pediatrics, Anugrah Narayan Magadh Medical College & Hospital, Gaya.
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Abstract

Background: Scorpion sting envenomation is a life threatening emergency if untreated. The main objective is to study the clinical profile, outcome and efficacy of prazosin in scorpion sting envenomation in children.

Materials & Methods: A prospective study was conducted over a period of one & half years from May 2019 to November 2020 in The Department of Pediatrics in ANMMCH Gaya. Case records were analyzed for age and sex of the patient; site of scorpion sting, time lapsed from the scorpion sting to hospitalization, clinical manifestations, treatment and outcome were recorded.

Results: During the study period, 100 children were admitted for scorpion sting. Majority of the children are from rural area, male sex, and stung in lower limb mostly in summer. Local pain at the site of sting and sweating are the commonest local symptoms and systemic sign, respectively. Complication like myocardial dysfunction, acute pulmonary edema and encephalopathy may also developed. 52% children had class II severity. Mortality was seen in 5% children. Outcome was directly proportional to sting-prazosin interval.

Conclusions: Prompt referral and early therapy with prazosin is life saving for scorpion sting envenomation in children.

Keywords: Scorpion sting envenomation, Prazosin, alpha blocker

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I. Introduction

Scorpion sting is an important public health hazard in India. There are 86 species of scorpion in India, out of which, Mesobuthus Tamulus and Palamneus-swammerdami are of medical importance^{1,2}. Scorpions live 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. They are nocturnal arachnids. They emerge only at night, thus most stings are reported at night. Stings are primarily due to accidental contact with scorpion.³

Scorpion sting envenomation is a life threatening emergency in children if untreated. Significant reduction in morbidity and mortality due to scorpion sting envenomation has been achieved by use of prazosin⁴. Having achieved significant reduction in mortality in scorpion sting envenomation, the need of the hour is to reduce morbidity due to scorpion sting envenomation, among which myocardial dysfunction is most important⁵. The clinical manifestations of scorpion sting envenomation are due to a massive release of sympathetic and parasympathetic neurotransmitters.^{6,7} 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 inhibits calcium dependent potassium channels. It leads to autonomic storm. Stimulation of Alpha receptor stimulation results in hypertension, tachycardia, myocardial dysfunction, pulmonary oedema and cool extremities. Direct effect of toxins on neurons could contribute to seizures and encephalopathy.⁸ The present study was aimed to study clinical profile, outcome and efficacy of prazosin in scorpion sting envenomation in children.

II. Materials & Methods

This prospective study analyzed the clinical profile of 100 children under 15 years of age who were admitted to the Department of Pediatrics, ANMMCH Gaya from May 2019 to November 2020. Inclusion criteria in this study were children admitted with positive history of scorpion sting, with scorpion being seen or killed by relatives or bystanders. Exclusion criteria: patients other than scorpion envenomation. Informed consent was taken from parents or relatives. Data recorded for each case included: age and sex of the patient, site of scorpion sting, season, clinical manifestations. Details of pre-hospital treatment were noted; it included whether any pre-hospital therapy was given and if so drugs used in pre-hospital treatment. Time interval between sting and admission was obtained from the medical records. duration of hospital stay, and outcome. Clinical parameters like heart rate, presence or absence of S3 gallop, peripheral pulse character, capillary refill time, blood pressure, respiratory rate, presence of subcostal retractions, priapism at the time of admission were noted. X-ray changes, ECG abnormalities, administration of inotropes, time interval between sting and prazosin administration, clinical classification based on Abroug's classification

The severity of envenomation was classified according to Abroug's classification as follows.

Severity class I: Local symptoms including local pain, erythema and paresthesia restricted to the sting area;

Severity class II: Shivering, cool extremities, excessive sweating, nausea and vomiting, hypertension, and priapism.

Severity class III: Cardiovascular, respiratory or neurological symptoms such as cardiogenic shock, pulmonary edema, altered consciousness, and convulsive crisis.

All cases were treated according to treatment protocol of the institute. Patients with cold extremities, sweating, and tachycardia were treated with oral prazosin. Patients with features of shock and myocarditis were treated with prazosin plus dobutamine. All patients were monitored till the signs of recovery. We did not use anti-venom in any patient. Data Analysis was done using Microsoft office Excel software. Statistical analysis was done using SPSS version 25. Prevalence of various demographic and clinical parameters is expressed in proportions.

III. Result

A total of 100 children, there was a male preponderance noted with a male : female ratio of 1.5:1. The peak noted in the age distribution at 5-10 years(45%), 10-15 years(35%) of age group followed by 20% for 0-5 years. The majority (44%) of the stings occurred during the summer. It is more common in rural area. maximum patients (80%) had scorpion sting at night time and only (20%) patients had scorpion sting at day time.

Table 1 : Characteristics in children with scorpion sting envenomation (n=100)

Characteristic	Percentage(%)
Site of sting	
Upper limb	38
Lower limb	47
Trunk	5
Head & neck	3
Unknown	7
Severity of envenomation at admission	
Class I	35
Class II	52
Class III	13
Symptoms and sign	
Local pain	90
Vomiting	72
Sweating	87
Salivation	42
Cold extremities	82
Priapism	43
Seizure	3
Bradycardia	8
Tachycardia	50
Hypotension	12
Hypertension	10

Encephalopathy	9
Echocardiography evidence of LV dysfunction	27
Acute pulmonary edema	15

Table 2 sting –prazosin interval

sting –prazosin interval(hrs)	Percentage
<1	22
1-2	44
2-3	20
3-4	12
>4	2

The most common site of scorpion sting was lower limbs (47%), followed by upper limb (38%), trunk (5%), and head and neck (3%).

The local symptoms & signs noted were local pain (90%), vomiting (72%), sweating (87%), salivation (42%), cold extremities (82%), priapism (43%), S, bradycardia (8%), tachycardia (50%), hypotension (12%), hypertension (10%), encephalopathy (9%). The echocardiographic evidence of LV dysfunction present in 27% of cases, and Acute pulmonary edema 15%.

27% cases had myocardial dysfunction secondary to scorpion sting envenomation. Children who develop myocardial dysfunction had a longer time gap between sting and admission in comparison to those who did not develop myocardial dysfunction. With regard to severity, (35%), (52%), and (13%) patients were classified into classes I, II and III, respectively. The mean duration of stay in the hospital was 10 days. mortality was seen in 5% children.

IV. Discussion

Scorpion sting envenomation is one of the common medical emergencies among children, especially in rural areas. In the present study, maximum number of scorpion sting among children has occurred in the age group of 5 to 10 years, whereas Pol R et al reported 2-7 years as most involved group.⁹

Boys were stung more often girls. Similar findings were observed by other studies.^{9,10} This male predominance of scorpion sting may be due to higher inquisitive nature of boys and boys go outside more commonly than girls, especially during night. The incidence of scorpion sting is more during summer than other season.

Majority of the children the site of scorpion sting was lower limbs, which was similar to Pol et al, Bosnak et al and Farhly et al's observations.^{9,11,12}

The local symptom of scorpion sting include pain at the site of sting (most common), followed by redness, swelling, itching and numbness. The common systemic signs include cool extremities, sweating, and tachycardia. Cold extremities were reported in majority of patients in their studies by Bawasker et al and Biswal et al.^{13,14}

(27%) cases had reduced left ventricular ejection fraction which resolved completely at the time of discharge. Our study correlates with study done by Maheshwari et al., 2012 where a patient had reduced left ventricular ejection fraction.

In this study, 22% of patients received the prazosin within 24 hours and 44% of the patients received the prazosin within 1-2 hours, 20% of patients received the prazosin within 2-3 hours, 12% of patients received after 3-4 hours, 2% of patients after 4 hours. Complication were developed less frequently in children who treated with prazosin early.

In present study 94 patients received the first aid treatment at local clinic, primary health care center for supportive care.

V. Conclusion

Scorpion sting envenomation is a common medical emergency among children. Early and effective use of prazosin treatment showed good outcome in patients. Less complications were seen in patients undergo prior treatment before hospitalization.

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