



Management of Scorpion Envenomation in Children

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ABSTRACT

Introduction: *The study was aimed to describe our experience with epidemiological characteristics, management options, and outcome of scorpion envenomation in children.*

Materials and Methods: *This prospective study was conducted at Rajah Muthiah Medical College and Hospital. The epidemiologic details including geographical locality of the event, age distribution, gender, and sting sites were noted in all hospitalized children with scorpion bite injury.*

Results: *During the study period, a total 100 children were managed for scorpion sting. Male children were commoner victims of scorpion sting. Scorpion sting had bimodal pattern. Prazosin was used in 89 children.*

Conclusion: *In this study, there was bimodal distribution of the scorpion sting cases, male children were more affected, and almost all of them improved with good outcome. We did not use anti-venin in the present study. The data from the study will serve not only to create heightened public awareness about scorpion envenomation but also to develop public awareness strategies and preventive measures.*

Keywords: *scorpion sting, scorpion, scorpion envenomation.*

Introduction

Scorpions are a group of arthropods belonging to the family Buthidae, which are potentially dangerous to humans.^[1,2] There are about 86 species of scorpions found in India. Among them only 3 are poisonous. They include 1. Mesobuthus tumulus, 2. Palamnaeus swammerdami, 3. Heterometrus bengalensis. Due to their high incidence, scorpion envenomation is an important and serious health problem in many tropical and subtropical countries.^[2,10] This study was aimed to describe the epidemiological characteristics, management options, and outcome of scorpion envenomation in children.

Methodology

This is a prospective study conducted in the Department of Pediatrics, RMMCH during the period of Nov 2014 - Nov 2015. All cases with history of scorpion sting were examined thoroughly for various systemic manifestations and were included in the study. Total of 100 cases of scorpion sting envenomation were studied for various clinical manifestations with ECG & ECHO changes. Details of local and general symptoms including pain, swelling, redness, itching, excessive salivation, parasthesia, hypotension and sweating and data regarding sex, age, weight, data related to the sting site, time

elapsed from the accident to first medical attention, clinical symptoms, and vital signs at the moment of arrival, 30 mins later and then every hour until the patient was discharged from the hospital. Details of treatment, time spent in the hospital, evolution of envenoming, and any complications were also recorded. Laboratory investigations were performed in all children including hemoglobin, total white blood cell count, platelet count, prothrombin time, serum glucose, urea, creatinine, liver function tests (alanine aminotransferase, aspartate aminotransferase, creatine phosphokinase, lactate dehydrogenase), sodium, potassium, chloride, and calcium. Electrocardiography was performed in all cases. Prazosin was administered according to blood pressure and severity of envenomation. It was repeated as and when indicated. Injection Dobutamine was administered in patients with cardiogenic shock. We did not use anti-venom in any patient. All patients with scorpion sting were subjected to thorough clinical examination, investigations including ECG & ECHO to assess various systemic manifestations. All patients received tetanus toxoid depending on immunization status. Patients were treated with Tablet Prazosin, (except those with hypotension), I.V fluids, diuretics, O₂ inhalation and ionotropic supports were given whenever required. The patients vitals were initially continuously monitored and later once daily till the time of discharge.

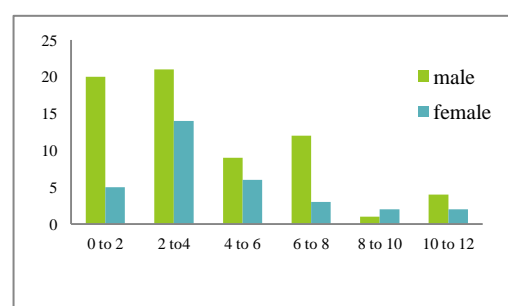
Observation and Results

During the study period, a total of 100 children were managed for scorpion sting. Male children were commoner victim of scorpion sting [Figure 1]. Scorpion sting had bimodal pattern more in late winter and early spring [Figure 2]. Various clinical presentations of the patients are shown in [Figure 3]. Site of bite was lower limb in 43 and upper limb in 37 cases (80% cases were stung over extremities.) Most of the bites occurred during evening time (59 cases- 6 PM to 12 AM).

Most of the children received prazosin (41%) within one hour of scorpion sting.

Most of the children were conscious at the time of presentation to emergency room. 18 children had priapism. 18 children had history of vomiting. 7 children had excessive sweating, and 46 children had cold extremities. Local pain was the presenting complaints in 59 children. Investigations showed hyperglycemia in 63 cases, elevated CKMB in 12 cases and elevated amylase in 6 cases. ECG changes (Sinus tachycardia in 71, sinus bradycardia in 8, ST changes in 12, tall T waves in 8 and T wave inversion in 3 cases respectively). Prazosin was used in 89 children. No death were observed during study period.

Fig 1: Age and Sex Distribution in Study Population



In this study, 68 patients were males and females contributed to 32 (32%). It is found that 3/4th percentage of cases of the study population were under 5 years of age. It is found that scorpion sting were common among males.

Fig 2: Month wise Distribution of Cases

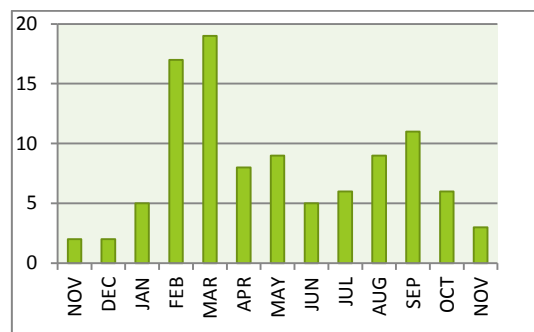


Fig 3: Clinical presentations

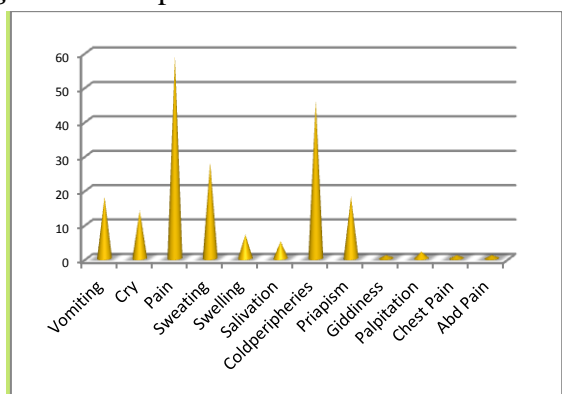
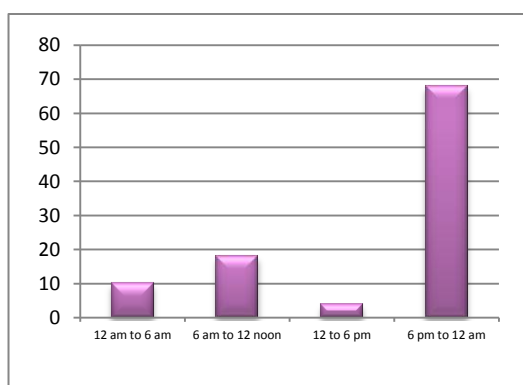
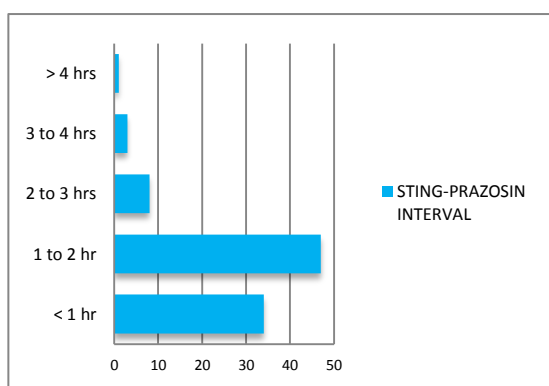


Fig 4 Time of Scorpion Sting in Study Population



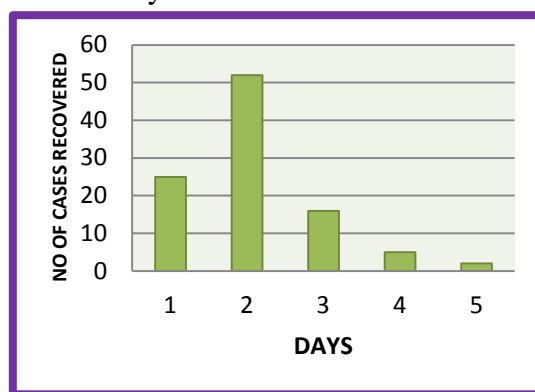
In this study of 100 patients, 59 cases stung by scorpion were in the time 6pm to 12am which explains the nature of scorpions.

Fig 5: Sting-Prazosin Interval



In this study 41% of patients received prazosin in <1 hr. 38% of patients received prazosin in 1-2 hrs, 6% in 2-3 hrs, 3% in 4 hrs and 1% in 5hrs.

Fig 6: Recovery Time



In this study, 25 cases recovered within 24 hrs, 52 cases within 2 days, 16 cases within 3 days, 5 cases in 4 days and 2 cases recovered after 5 days.

Discussion

Scorpions live in warm, dry regions. They inhabit underground burrows, underlogs or debris, paddy husks, sugarcane fields, coconut and banana plantations and also in crevices of dwellings.¹ They are active at night during the hot season and so probably associated with the high incidence of scorpion sting in children.^[1,2] Present study states that male children are more involved than female is consistent with many other studies where similar findings were observed.^[2,6,7,8] Because of the fact that boys probably go outside more commonly and play in places where scorpions live^[7] and their higher inquisitive nature and risk-taking behavior.^[7]

Scorpion stings usually occur at night^[10] and mostly involve the extremities.^[7,9] Few studies have reported more incidence in lower limbs.^[2,8] The scorpion sting can occur in children in the head, neck, and other locations of the body at sleep or rest due to putting on clothes without checking them or not checking bed mattresses.^[9] Scorpion venom is a water-soluble antigenic, complex mixture of neurotoxins, cardiotoxins, nephrotoxins, haemolysins, phosphodiesterases, phospholipase, hyaluronidases, histamine, and other chemicals.^[10]

Severity of scorpion envenomation is more in children because of the fact that, for the same quantity of venom inoculated, the serum levels of venom will be higher in children than in adult

patients and there is possibility of higher uptake in the heart and other organs.^[10]

The systemic manifestations are due to the release of neurotransmitters in response to the actions of the toxin on sodium channels causing an adrenergic or cholinergic syndrome leading to a range of clinical pictures according to the species of scorpion.^[1,3,4] The unopposed effects of alpha receptor stimulation can lead to suppression of insulin secretion causing hyperglycemia, and liberated free radicals causing injury to the myocardium.^[3,4] Clinical features can be localized (pain, hyperemia, edema, and numbness) and systemic effects (hyperthermia, nausea and vomiting, tachycardia, shivering).^[1,2,7] Severe scorpion envenomations can result in cardiovascular, pulmonary, and neurological manifestations and may be life-threatening due to myocardial dysfunction, shock, pulmonary edema, or hypertensive encephalopathy.

In scorpion sting, The mainstay of treatment is supportive care, symptomatic relief, and the use of specific scorpion anti-venom.^[1,4,8] Mild symptoms can be controlled with analgesics and anti-histamines in the majority.^[4,5,6,8]

Most of the patients could be treated symptomatically, and only in one third cases, anti-venin was administered.^[2] The use of Prazosin has been shown to neutralize the adverse effect of catecholamine released in the brain. In another study, it was found that there was no evidence of beneficial effects of routine administration of scorpion anti-venom to stung patients, irrespective of clinical severity.^[5,6] Oral prazosin and appropriate use of dobutamine with avoidance of atropine, excessive diuretics, steroids and anti-histaminics may be helpful to hasten the recovery in severe scorpion sting victim.^[4]

ECG is an important investigation which helps in the diagnosis of fatal conduction disturbance, ischaemia and very importantly myocarditis¹⁵.

Echocardiography- helps to detect left ventricular systolic dysfunction. The findings may be 1. Left ventricular dilatation 2.Regional wall

motion abnormalities 3.Decreased left ventricular ejection fraction¹⁵.

Conclusion

Scorpion stings are frequently seen in our country and the stings of scorpions living in some regions may be fatal. Although cases of scorpion stings are generally seen with simple local findings, it must be remembered that serious cardiovascular impairments such as acute myocarditis, acute heart failure, and acute pulmonary oedema may occur.

In endemic areas of venomous sting clothing, beddings, shoes, package should be vigorously shaken out and checked for scorpion without blindly putting hands.

In our study, almost all of them improved with good outcome .we did not use anti-venin in the present study.

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