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Original Research Article

## A study on clinical profile, management and outcome in pediatric patients admitted with scorpion envenomation

Kiruthika Umapathi<sup>1\*</sup>, P. Boopalan<sup>1</sup>, V. P. Maheshkumar<sup>1</sup>, R. Ramamoorthy<sup>2</sup>

<sup>1</sup>Department of Pharmacy, Annamalai University, Chidambaram, Tamilnadu, India

<sup>2</sup>Department of Pediatrics, Raja Muthiah medical college and hospital, Chidambaram, Tamilnadu, India

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### \*Correspondence:

Dr. Kiruthika Umapathi,

Email: kiruthikaumadevi@gmail.com

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### ABSTRACT

**Background:** Scorpion envenomation is a common medical emergency. The main aim is to study clinical profile, management and outcome.

**Methods:** Prospective observational study of Scorpion envenomation cases for six months. case sheets were analysed for clinical profile, symptoms, complications, management and outcome.

**Results:** During the study period first 50 cases were admitted and treated for the following results 66% were males and 34% were females, 46% were upper extremity and 54% were lower extremity. common clinical symptoms are pain at site, autonomic storm, palpitation, headaches, abdominal pain, altered sensorium, vomiting. 40% of patients received prazosin with 1-2 hrs. the major complications were myocarditis, encephalopathy, Peripheral circulatory failure & congestive cardiac failure. There was no mortality in this study.

**Conclusions:** The study finding shows that early and effective use of prazosin treatment showed good outcome in patients. Less complications were seen in patients those who received the first aid. This study concludes that majority of patient were exposed to complication due to shortfall in education, awareness and pre-hospitalization. We, as a clinical pharmacist, tried to create awareness and provide education to health care workers in all primary health care center through distributing pamphlets to general public in and around hospital.

**Keywords:** Scorpion, Envenomation, Clinical profile, Peripheral circulatory failure, Myocarditis, Prazosin

### INTRODUCTION

Scorpion envenomation is a common medical emergency.<sup>1</sup> and its mortality is higher in children's than adults in our country. Every year more than ten lakhs children of scorpion envenomation were reported worldwide. It is referred as the second most common envenomation next to the snake bite. There are more than 1500 species of scorpions are found throughout the world from that only eighty species found in India in that only three species are found to be poisonous and they are *Hottentotta tumulus*, *Heterometrus swammerdami*, *Heterometrus bengalensis*. Scorpion's sting more in pediatric victim due to their smaller body size and It also

involves many organ damages in the body simultaneously producing multiple organ dysfunction. In this condition an alpha blocker Prazosin plays a major role. It is a common problem, especially in villages around Chidambaram. The usefulness of prazosin therapy in scorpion sting was scientifically established in mid-eighties by Bawaskar et al which was later strengthened by many other investigators.<sup>2</sup> Children are mostly ambulatory and have explorative attitude and hence they have greater chances of envenomation. Mortality is now decreasing with timely intervention and referral. Due to the lack of adequate emergency medical facilities, morbidity and mortality rate of scorpion envenomation is still high in rural areas.<sup>3</sup> Hence aim is to study the clinical

profile, management and outcome of the paediatric patients admitted with scorpion envenomation.

## METHODS

### Source of data

Case sheets of children admitted with scorpion envenomation in our hospital.

### Study design

A hospital based prospective observational study. The study protocol was endorsed by the human research ethics committee of the institute prior to the commencement of the study (approval letter no IHEC/0397 Dated 09/01/19)

### Study place

The study was conducted in PICU and WARD in the Department of Paediatrics, Rajah Muthiah Medical College Hospital, Annamalai University, Annamalai Nagar, Chidambaram, Tamil Nadu.

### Study period

The duration of study is from November 2018 to April 2019

### Inclusion criteria

In this study inclusion criteria were patients who were treated as inpatients for diagnosis of scorpion envenomation, patients of both the gender, patients up to 12 years of age.

### Exclusion criteria

In this study exclusion criteria were patients other than scorpion envenomation, patients who were not interested to participate.

### Study parameters

All the case sheets were analysed for the following parameters. It includes age, gender, time of sting, place of sting, site of sting, sting prazosin interval, duration of hospital stay, prazosin dose and signs and symptoms includes pain at the site, autonomic storm, vomiting, palpitation, headaches, abdominal pain, altered sensorium, loss of consciousness and vitals such as heart rate, respiratory rate, blood pressure were recorded and treatment details includes IV fluids ,prazosin, tetanus toxoid, diclofenac, pheniramine maleate, lignocaine, dopamine, paracetamol, dobutamine treatment and ventilatory care were analysed. Outcomes were also analysed. Data analysis was performed using Microsoft office excel software.

## RESULTS

Scorpion sting envenomation is relatively common, sometimes life threatening, time limiting medical emergency in hospitals. It is the common accident encountered in rural parts. Many cases are unreported and true incidence is not known. During the period of study November 2018 to April 2019. 50 children (n=50) were admitted in PICU and ward in Rajah Muthiah Medical Hospital, Chidambaram. Following were observations. In this study maximum number of cases were in the age group of 0-3 years and 4-6 years (Table 1).

**Table 1: Age wise distribution (n=50).**

Age (years)	Total	Percentage (%)
0-3	20	40
4-6	16	32
7-9	5	10
10-12	9	18

**Table 2: Gender wise distribution (n=50).**

Gender	No of patients	Percentage (%)
Male	33	66
Female	17	34
Total	50	100

During this study 50 paediatric patients were enrolled in which majority of patients were males [66%] than females [34%] (Table 2).

**Table 3: Time of sting (n=50).**

Time	No of patients	Percentage (%)
Day	23	46
Night	27	54
Total	50	100

In this study maximum number of stings were during night time [54%] compared to day time [46%] (Table 3).

**Table 4: Site of sting (n=50).**

Site of sting	No of patients	Percentage (%)
Upper extremity	23	46
Lower extremity	27	54

In this study 27 patients [54%] had sting over the lower extremity and 23 [46%] patients were the upper extremity (Table 4).

**Table 5: Place of sting.**

Sr: no	Place of sting	No of patients	Percentage
1	Indoor	23	46
2	Outdoor	27	54

In this study, majority of sting occurred in outdoor (54%) compared to that of during indoor (46%) (Table 5).

**Table 6: Sting-prazosin interval (n=50).**

Sting-prazosin interval (hrs)	No of patients	Percentage (%)
<1	11	22
1-2	20	40
2-3	11	22
3-4	7	14
>4	1	2

In this study, 22% of patients had received the prazosin within 24 hours and 40% of patients received prazosin within 1-2 hrs, 22% of patients received prazosin within 2-3 hrs, 14% of patients received after 3-4 hrs, 2% of patients after 4 hrs (Table 6).

**Table 7: Presenting symptoms (n=50).**

S. no	Symptoms	No of patients	Percentage (%)
1	Pain at site	40	80
2	Autonomic storm	24	48
3	Vomiting	9	18
4	Palpitation	7	14
5	Incesant cry	7	14
6	Headache	3	6
7	Abdominal pain	3	6
8	Altered sensorium	2	4
9	Loss of consciousness	1	2

Pain at the site was present in 40 patients (80%) in our study and resolved spontaneously within 12 to 24 hrs without any local complications. The other common symptoms were, Autonomic storm was present in 24 patients (48%), headache was present in 3 patients (6%),vomiting was present in 9 patients (18%), abdominal pain was present in 3 patients (6%), palpitation was present in 7 patients (14%), loss of consciousness 1 patient (2%), Altered sensorium was present in 2 patients (4%),and incessant cry was present in 7 patients (14%). Priapism was noted in nearly 15 of male children (Table 7).

In this study, complications were found to be Myocarditis and it was present in 6 patients (12%), peripheral circulatory failure was present in 9 patients (18%), coronary heart failure was present in 1 patient (2%),

convulsion was present in 2 patients (4%), Encephalopathy was present in 1 patient (2%) (Table 8).

**Table 8: Complications (n=50).**

S. no.	Complications	No of patients	Percentage (%)
1	Peripheral circulatory failure	9	18
2	Myocarditis	6	12
3	Encephalopathy	2	4
4	Congestive cardiac failure	1	2

**Table 9: Management of scorpion envenomation treatment history.**

First aid treatment	No of patients	Percentage
<b>Medications</b>		
Dobutamine	11	22
Tetanus toxoid	15	30
Diclofenac	4	8
Prazosin	10	20
Pheniramine maleate	5	10
Lignocaine	1	2
Dopamine	1	2
Paracetamol	1	2
<b>During hospitalisation</b>		
Iv fluids	50	100
Prazosin	50	100
Paracetamol	34	68
Dobutamine	15	30

In this study 48 patient received the first aid management such as tetanus toxoid, paracetamol, diclofenac (given for the pain at the sting site), prazosin, dobutamine, pheniramine maleate, lignocaine, dopamine from local clinic, community health centre and primary healthcare centre for first aid, pain management and supportive care.

During hospitalisation all the 50 patients had received the IV fluids and prazosin at an average dose of 0.5 mg, 34 patients received the paracetamol and 15 patients received dobutamine (Table 9).

## DISCUSSION

Scorpion sting envenomation is relatively common, sometimes life threatening, time limiting medical emergency in hospitals. It is the common accident encountered in rural parts. Many cases are unreported and true incidence is not known. In scorpion sting study, the main treatment is supportive care, relieve from symptoms, and use of specific scorpion anti-venom.<sup>5</sup> Minor symptoms were controlled with anti-histamines and analgesics.<sup>4</sup> The main aim in use of prazosin is to neutralize the conflicting effect of catecholamine discharged from the brain. other study shows that, there

was no evidence of benefit effect on conventional administration of scorpion anti- venom to stung patient, irrespective of clinical severity.<sup>4</sup>

In this age distribution of the study showed majority of the patients with scorpion envenomation are belonged to 0-3 years age group accounting for about 40% whereas the least belonged to 7-9 years of age is about 10%. Maximum number of cases noted in 0-3 years and 4-6 years of age as Pol et al reported 2-7 years as the most involved as group.<sup>6</sup>

During this study 50 paediatric patients were enrolled in which majority of patients were males [66%] than females [34%]. Present study states that male children were more exposed than the females this result is consistent with many other studies where similar findings were observed.<sup>7,8</sup> Because of the fact that boys probably go outside more commonly and play in place where scorpions live.<sup>9</sup>

In this study maximum number of stings were during night time [54%] compared to day time [46%] whereas Soren et al study says that maximum sting is during the night time this might because scorpion is more active at night.<sup>10</sup> A27 patients [54%] had sting over the lower extremity and 23 [46%] patients were the upper extremity. In majority of children the site of sting was seen in lower limbs, which was similar to Pol et al, Bosnak et al and Farhlyat's observation.<sup>8,9,11</sup>

In this majority of sting occurred in outdoor (54%) compared to that of during indoor (46%). T. Madhavan et al (2018) study say that a greater number of scorpion sting in children where in indoor where as our study shows more children stung in outdoor. we observed the contrary results may because of our child population involving more outdoor activity like playing in agricultural fields.

Pain at the site was present in 40 patients (80%) in our study and resolved spontaneously within 12 to 24 hrs without any local complications. The other common symptoms were, Autonomic storm was present in 24 patients (48%), headache was present in 3 patients (6%), vomiting was present in 9 patients (18%), abdominal pain was present in 3 patients (6%), palpitation was present in 7 patients (14%), loss of consciousness 1 patient (2%), Altered sensorium was present in 2 patients (4%), and incessant cry was present in 7 patients (14%). Priapism was noted in nearly 15 of male children. But Bawaskar et.al has noted occurrence of this clinical symptoms in as many as 10% Of patients and this is similar to study done by balasubramaniam et al.<sup>12,13</sup>

In this study, 22% of patients had received the prazosin within 24 hours and 40% of patients received prazosin within 1-2 hrs, 22% of patients received prazosin within 2-3 hrs, 14% of patients received after 3-4 hrs, 2% of patients after 4 hrs.

Complication were noted less frequently in children who received a dose a prazosin early (<3 hrs of sting). By comparing other studies related to this in India, shows that early and effective administration of prazosin significantly reduced the incidence of complication. some patients were diagnosed already known case of cardiac disorders such as myocarditis, circulatory failure.

In this study 20 % of patients received single dose of prazosin, 30% of patients received 2 doses of prazosin, 18% of patients received 3 doses of prazosin and 32% of patients received over 4 doses as per AIIMS protocol. The mean duration of hospital stay is 3 days. There was no mortality due to scorpion envenomation seen in period of study.

In this study 48 patient received the first aid management such as tetanus toxoid, paracetamol, diclofenac (given for the pain at the sting site), prazosin, dobutamine, pheniramine maleate, lignocaine, dopamine from local clinic, community health centre and primary healthcare centre for first aid, pain management and supportive care.

During hospitalisation all the 50 patients had received the IV fluids and prazosin at an average dose of 0.5mg, 34 patients received the paracetamol and 15 patients received dobutamine. Majority of the children developed severe manifestation of scorpion envenomation, hence monitoring closely is needed. IV fluids and prazosin must be given as emergency measure. Most of the patients with myocardial dysfunction during scorpion sting study respond to dobutamine insertion. The study findings show early and effective use of prazosin showed good outcome through the time of sting and dose of prazosin given less time period indicates the better outcome.

## CONCLUSION

The study finding shows that Early and effective use of prazosin treatment showed good outcome in patients. Less complications were seen in patients who received the first aid before hospitalization. This study concludes that majority of patient were exposed to complication due to shortfall of education, awareness and pre-hospitalization (first aid). We, as a clinical pharmacist, tried to create awareness and provide education to health care workers in all primary health care Centre through distributing pamphlets to general public in and around hospital.

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