

Clinical Profile of Envenomation in Children With Reference To Scorpion Sting

Dr.G.V.S.Subrahmanyam¹, Dr.Ajay Mohan Varahala², Dr.D.Chandraiah³,
Dr.Purushotham Raju Amrutha⁴

¹ Professor of Paediatrics, Niloufer Hospital, Hyderabad, India

² Assistant Professor of Paediatrics, Niloufer Hospital, Hyderabad, India

³ Assistant Professor of Paediatrics, Niloufer Hospital, Hyderabad, India

⁴ Postgraduate in Paediatrics in Niloufer Hospital, Hyderabad, India

Abstract:

Back Ground: Scorpion sting envenomation is a preventable life-threatening medical accident. Timely intervention and management can prevent the mortality due to scorpion sting which is grossly under reported.

Objective: This study aims at identifying the demographics, clinical manifestations, management and response to treatment in the victims of snake bite over a period of one year.

Methodology: It is a prospective observational study conducted on all the paediatric cases admitted to Niloufer Hospital, with history of scorpion sting. The clinical details, investigations and treatment plan based on the envenomation for all the patients are studied thoroughly.

Results: A total of 33 children were a part of this study of which majority (75.75%) are from rural areas. Commonest presenting feature was cold peripheries followed by sweating and pain. Myocarditis was the serious complication noted in scorpion sting envenomation which required intense monitoring.

Conclusion: Scorpion sting envenomation in children is a significant environmental health hazard especially in rural areas. Early intervention and timely management can bring down the mortality and morbidity in the scorpion sting envenomation cases. Therefore the government and health authorities should ensure adequate medical facilities and emergency care at all times from the Primary health care level.

Key Words: Cold peripheries, Envenomation, Myocarditis, Pain, Scorpion sting, sweating

I. Introduction

Scorpion sting are preventable life-threatening environmental hazard. Children are at risk of sustaining scorpion sting mainly because of their curiosity about the unknown creatures, innocent act of invading the arthropod's space and habit of barefoot walking particularly in the darkness. There are about 1500 scorpion species worldwide, 50 are dangerous to humans. Almost all of lethal scorpions belong to Buthide family¹. There are about 86 species of scorpions which are found in India^{2,3}. Only three scorpions found in India are poisonous. They include 1) Mesobuthus tamulus 2) Palamneus swammerdami 3) Heterometrus bengalensis. Scorpions are not aggressive as they do not hunt for prey, they wait for it. Envenomation due to scorpion sting results in various clinical manifestations. They range from mild local pain to diffuse irresistible pain of whole limb and body to systemic manifestation involving almost all systems, predominantly cardiovascular and may sometimes lead to death^{1,4}. Most of the manifestations of scorpion envenomation are due to stimulation of autonomic nervous system either directly or indirectly, resulting in various autonomic system disturbances. Of which most important is autonomic storm^{4,5}. Scorpion venom is a water soluble, antigenic, heterogenous mixture, as demonstrated on electrophoresis studies. The venom is composed of varying concentration of neurotoxin, cardiotoxin, nephrotoxin, haemolytic toxin, phosphodiesterase, phospholipases, hyaluronidases, glycosaminoglycans, histamine, serotonin, and tryptophan and cytokine releasers^{6,7,8,9}.

II. Objective

The present study aims at recording the various clinical manifestations, complications and outcomes in children who are victims of scorpion sting.

III. Methodology

Source Of Data:-

33 children admitted with scorpion sting during the period January 2013 to December 2013 were studied.

Study Type: -

Prospective observation study conducted at Niloufer hospital which is a tertiary care centre and also an allied institute of Osmania Medical college, Hyderabad.

Inclusion Criteria: -

- i) All children (if able to tell) with history of scorpion sting.
- ii) Children (if unable to tell)
 - a) History given by witnesses (who has seen the sting)
 - b) Clinical features suggestive of scorpion sting with presence of scorpion at the premises of affected children.

Exclusion Criteria: -

Children with history of suspected scorpion sting where in:

- i) Patients or attendants have not seen the scorpion.
- ii) Children with pre-existing congenital heart diseases and chronic kidney diseases or other chronic illness.

Method Of Collection Of Data: -

All children with scorpion sting were subjected to thorough clinical examination to assess various systemic manifestations. All the patients were subjected to necessary investigations. Demographic features like age, sex, time since sting to the arrival to the hospital and clinical parameters like pain at the site of sting, swelling, paresthesia, profuse sweating, excessive salivation and hypotension are recorded. ECG changes were also studied. All patients received tetanus toxoid depending on immunization status. All patients with local pain were treated with 2% Xylocaine local infiltration and repeated if necessary. Tablet Prazosin, (except those with hypotension), I.V fluids, diuretics, O2 inhalation and ionotropic supports were given when ever required. The patients were initially continuously monitored and later once daily till the time of discharge.

IV. Results

During the study period from January 2013 to December 2013, a total of 33 children were admitted in Niloufer Hospital with the history of scorpion sting. Following are the observation in those 33 children.

Table-1 Incidence Of Envenomation Cases In Niloufer Hospital

	NO. OF CASES
Scorpion sting	33
Total admissions	52,875

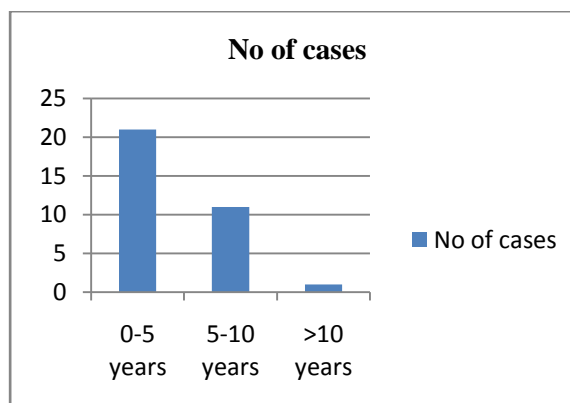
The Hospital incidence of scorpion sting is 62 per 1,00,000 admissions per year.

Age Wise Distribution

TABLE-2

Age	Scorpion sting	Percentage
0-5 years	21	63.63%
5-10 years	11	33.3%
>10 years	1	3.03%

CHART-1



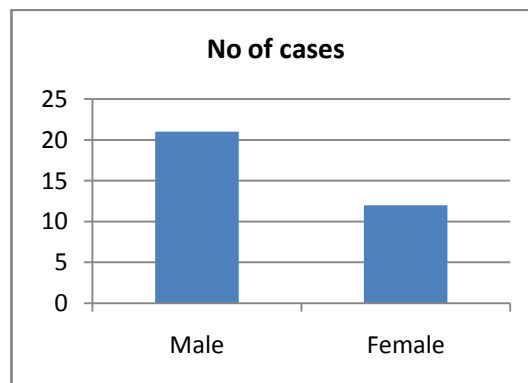
All age groups were affected. The youngest child was 11 months, who suffered from scorpion sting. Maximum incidence of scorpion sting was seen in the group of 0-5 years, accounting for 63.63% of scorpion stings.

Sex Wise Distribution

TABLE-3

Sex	Scorpion sting	Percentage
Male	21(27.6%)	63.63%
Female	12(15.79%)	36.36%

CHART-2



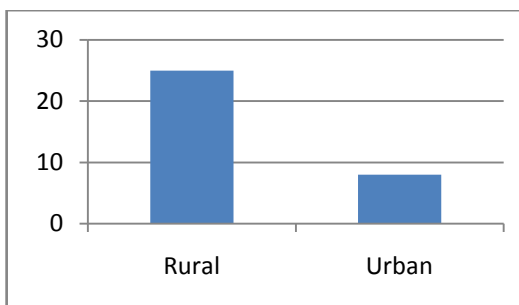
Scorpion sting cases were more common in males. Male to Female ratio is 1.75:1

Rural And Urban Distribution

TABLE-4

Place	Scorpion sting	Percentage
Rural	25	75.75%
Urban	8	24.24%

CHART-3



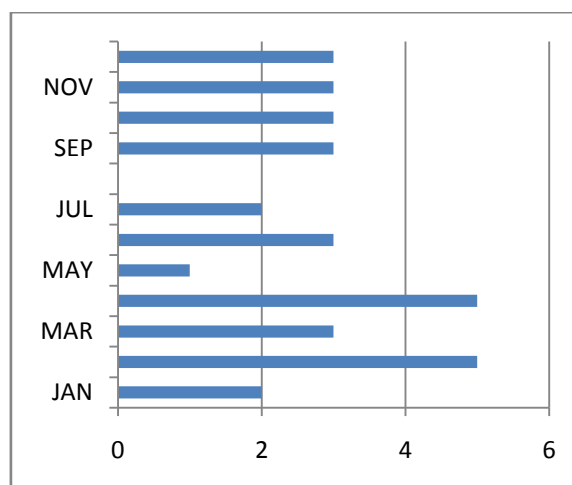
Envenomation cases were mainly reported from rural areas. About 75.75% of scorpion sting cases were from rural places, while the rest 24.24% were from urban places.

DISTRIBUTION AROUND THE YEAR

TABLE-5

Month	Scorpion sting	Percentage
January	2	6.06%
February	5	15.15%
March	3	9.09%
April	5	15.15%
May	1	3.03%
June	3	9.09%
July	2	6.06%
August	0	0
September	3	9.09%
October	3	9.09%
November	3	9.09%
December	3	9.09%

CHART-4



Scorpion sting cases were distributed all around the year except in August, when no scorpion stings was reported.

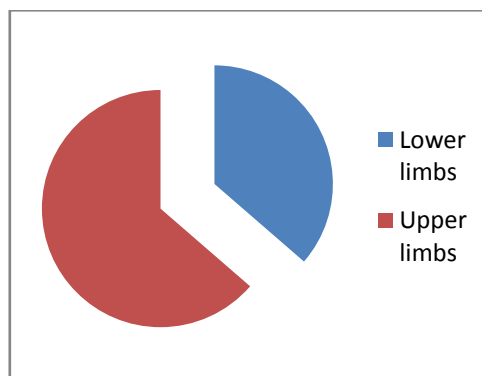
Site Of The Sting

TABLE-6

Site of sting	Scorpion sting	Percentage
Lower limb	12	36.36%
Upper limb	21	63.63%
Other parts	0	0%

Limbs were the commonest site for sting. Among the limbs u by lower limb.

CHART-5

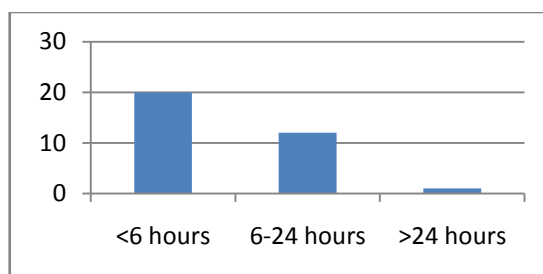


Time Since Sting To Arrival To Hospital

TABLE-7

Time since sting	Scorpion sting	Percentage
<6 hours	20	60.6%
6-24 hours	12	36.36%
>24 hours	1	3.03%

CHART-6



Out of 33 cases, 20 children were brought within 6 hours (i.e. 60.6% of cases). Only 1(one) child was brought after 24 hours of sting.

Table-8 Clinical Features In Scorpion Sting

Clinical feature	Number of cases	Percentage
Pain	19	57.58%
Profuse sweating	20	60.60%
Vomiting	14	42.42%
Cold peripheries	27	81.81%
Myocarditis (pulmonary edema)	3	9.09%

81.81% of Scorpion sting cases developed cold peripheries. Profuse sweating in 60.6% cases and pain in 57.58% of scorpion sting cases were noted. Out of 33 scorpion stings, only 3 cases (9.09%) developed myocarditis.

TABLE-9 NUMBER OF PRAZOSIN (30 µg/KG/DOSE) DOSES RECEIVED IN SCORPION STING

Number of Doses	Number of cases received	Percentage
No Dose	6	18.18%
Single Dose	0	0
2 Doses	11	33.33%
3 Doses	12	36.36%
4 Doses	4	12.12%

12 Scorpion sting cases required 3 doses of Prazosin for controlling autonomic storm.

TABLE-10 DURATION OF HOSPITAL STAY

Insult	Range (in days)	Mean (in days)
Scorpion sting	3-10	4.48

Mean duration of hospital stay of scorpion sting was 4.48 days.

V. Discussion

We had a total of 33 children, who were registered during the one year study. Incidence of scorpion sting in Niloufer Hospital was 62 per 1,00,000 per year.

In our study, incidence of scorpion sting was more in boys (63.63%) as compared to girls. This is in consensus with other studies where the incidence is always higher in male children who can be attributed to their behaviour and nature to play more of outdoor games¹⁰. Children below 5 years of age were more affected with scorpion sting envenomation in the present study. The incidence is 63.63%. It is because of children's curiosity about the unknown creatures and their innocent acts like intruding the arthropod's space.

25 cases (75.75%) have reported from rural places. 20 cases reached Niloufer hospital within 6 hours of scorpion sting. Rest of the cases reached our centre after 6 hours. On enquiry, it is learnt that the reasons for delay are:

1. Approaching a locally available quack, or faith healer or a medical facility and reaching our tertiary care only when there was no improvement in the condition or when the condition has worsened.
2. Lack of adequate transportation facilities.

In our study out of 33 scorpion stings, 21 stings are over upper limbs (63.63%). The common situation in which a child is stung by a scorpion is either when he/she walks into a poorly lit room or when he/she stretches the hands in dark corners to pick up some objects/toys.

Table 9 Clinical Profile Of Scorpion Sting

Clinical feature	Our study	RajaRajeswari ¹²	S.Das et al ²
Pain	57.58%	-	-
Sweating	60.60%	68%	78.12%
Vomiting	42.42%	40%	-
Cold peripheries	81.81%	68%	93.75%
Myocarditis (Pulmonary oedema)	9.09%	3%	9.37%

Pain was present in 57.58% of scorpion sting cases. Pain varied in severity from child to child but generally within a matter of minutes the local burning pain spread proximally. The description of spread to the proximal sites is strongly suggestive of the lymphatic dissemination of scorpion venom. The persistence of the pain with or without radiation also varied greatly. In some of these children, pain lasted only for a few minutes, in yet others it lasted for several hours. Pain as a symptom of scorpion sting is so characteristic that in children complaining of pain with history of sting by unidentified or unseen creatures, scorpion sting must be strongly suspected and they must be observed for possible appearance of complication of scorpion sting. It is noted from the study that those with severe pain at presentation had relatively milder systemic manifestation and majority of children with severe envenomation had mild pain, this finding is accordance with the findings of Bawaskar¹¹ and S.Mahadevan³. Profuse sweating was seen in 60.60% of scorpion sting, which was less than that observed in S.Das et al (78.12%). Myocarditis was noted in 9.09% of scorpion sting which was almost equal to S.Das et al study² (9.37%). Vomiting was noted in 42.42% of scorpion sting, which was slightly more than that observed in RajaRajeswari study¹² (40%). Cold peripheries seen in 81.81% children, which is less compared to S.Das et al study², but more compare to RajaRajeswari study¹².

V. Conclusions

This is prospective observation study done over a period of one year from January 2013 to December 2013. Our study included 33 children of envenomation cases with reference to scorpion sting. The study concludes that Scorpion sting cases when treated with prazosin, most of the cases responded well. There are no deaths of scorpion sting cases recorded during this study period.

The study highlights the importance of early intervention and timely management which can bring down the mortality and morbidity in the scorpion sting envenomation cases. Hence the government and authorities of the health system should ensure the availability of life saving measures even at the Primary Health Care level. The study concludes that awareness among the people regarding the early initiation of treatment is necessary to reduce the fatality rates because of this environmental health hazard.

References

- [1] David Cheng et al: Scorpion sting, eMedicine; July 18 2002.
- [2] Das S, Nalini P, Ananthkrishnan S, et al: Scorpion envenomation in children in southern India. *J. Trop.Med.Hyg.*, oct 1995; 98(5):306-308.
- [3] Shankar Mahadevan et al., Scorpion sting envenomation, *Ind. Ped.*, May 2000; 37:504-511.
- [4] Ismail M: The scorpion envenoming syndrome. *Toxicon*, 1995; 33:825–58.
- [5] Yarom R. Scorpion venom: a tutorial review of its effects in men and experimental animals. *Clin Toxicol* 1970;3:561-9.
- [6] David. A. Warrel., *Envenoming by snakes and venomous arthropods*, API text book of Medicine.
- [7] Ramachandran L. K, Agarwal O.P, Acythan. K.E: Fractionation and biologic activities of venoms of Indian scorpions *Buthus tamulus* and *Heterometrus Bengalensis*. *Indian Journal of Biocheistry and Bophysics*; Dec 1986; 23: 355-358 75.
- [8] Freire-Maia L, Campos JA: Path physiology and treatment of scorpion poisoning. In: *Natural toxins: characterisation, pharmacology and therapeutics*,1989; 139–59 14.
- [9] Ismail M, Abd-Elsalam MA: Are the toxicological effects of scorpion envenomation related to tissue venom concentration? *Toxicon*, 1988; 26:233–56.
- [10] Shashidhar G, Lokesh S, Aravind Karinagannavar. A Clinical Spectrum of Scorpion Sting at Vijayanagar Institute of Medical Sciences, Bellary. *Journal of Evolution of Medical and Dental Sciences* 2014; Vol 3, Issue 57, October 30; Page 12961-12970.
- [11] Bawasskar. H.S; Diagnostic cardiac premonitory signs and symptoms of red scorpion sting, *Lancet*,1982;ii:552-54.
- [12] Rajarajeswari G, Sivaprakasam S, Viswanathan J. Morbidity and mortality pattern in scorpion stings. (A review of 68 cases). *J Indian Med Assoc.* 1979;73(7-8):123-6.
- [13] Ismail M, Abd-Elsalam MA: Are the toxicological effects of scorpion envenomation related to tissue venom concentration? *Toxicon*, 1988; 26:233–56.
- [14] Bawaskar .H.S and Bawaskar. P. H: Symptoms, signs and management of Indian red scorpion envenomation, *Medicine update; APICON, API, India*, 1998; 475-6.
- [15] Gueron, M., Adolph, R. J., Grupp, I. L., Gabel, M., Grupp, G. and Fowler, N. O.: Haemodynamic and myocardial consequences of scorpion venom. *Amer. J. Cardiol.*,45:979-986,1980.