Original Research Article

Clinical profile of scorpion sting envenomation in children: A study at tertiary hospital

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Abstract

Background: Scorpion sting is an important public health hazard in India. Presentation of scorpion sting may vary from localised pain at the site of the sting to life threatening condition. The main objective is to study the clinical profile of scorpion sting in children. **Methods:** 50 cases of scorpion sting, admitted to the emergency department of BKL Walawalkar Hospital less than 18 years of age were included. Detailed history, clinical features, investigations, treatment modalities and outcome were recorded. **Results:** During the study period, 50 cases were admitted and treated with the following results. 32% was Grade I, 38% was Grade II and 30% was of Grade III severity. Majority of the patients were between 2 to 5 years of age group. There was no mortality. Pain at sting site, diaphoresis and vomiting were the common clinical symptoms. The common clinical signs were tachycardia and hypertension. Male predominance were noted in the study. 82% of cases received first dose of prazosin within 6 hours. The common complications were Peripheral circulatory failure and congestive cardiac failure. Outcome was directly proportional to sting- prazosin interval. **Conclusions:** The morbidity and mortality of scorpion envenomation is directly related to the sting-Prazosin interval. Education of Health care workers in all Primary health centers and Government hospitals about scorpion sting and its need for early treatment with prazosin will reduce morbidity and mortality due to scorpion sting. Further, antiscorpion venom should be made available widely to prevent complications and mortality.

Keywords: Scorpion sting, Peripheral circulatory failure, Severe local pain.

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INTRODUCTION

Scorpion sting is an important public health hazard in India. There are about 1500 species of scorpions worldwide, of which about 50 are dangerous to man. There are 86 species of scorpion in india, out of which, Mesobuthus Tamulus and Palamneus- swammerdami are of medical importance.[1, 2] Scorpions lives 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]

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 could 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 a

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tertiary care hospital at BKL Walawalkar Medical college and hospital Dervan Chiplun, Ratnagiri district.

METHOD

This retrospective study was conducted in Department of Paediatrics BKL Walawalkar Medical College Hospital Dervan, Chiplun, Ratnagiri District. 50 Children less than 18 years of age who were admitted in the paediatric emergency department with history of scorpion sting from Jan 2018 to June 2019 were included. Patient with unknown bite were excluded. Clinical and epidemiological data were obtained from the medical records and comprised of the following variables like age, sex, time of sting, site of sting, symptoms like pain, swelling, sweating, salivation, vomiting, cold extremities, altered sensorium. 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. 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 and duration of hospital stay were also recorded. Operational Definitions Used Time of sting from 8 AM to 8 PM was taken as day time and from 8 PM to 8 AM taken as night. Details of pre-hospital treatment including the drugs used were also collected. Tachycardia, bradycardia, hypertension, hypotension, tachypnoea, bradypnoea, shock and myocarditis were defined as per PALS (Paediatric Advanced Life Support). X-ray features of cardiomegaly, increased pulmonary vascular markings and pulmonary edema were considered abnormal. According to the signs and symptoms, patients were classified based on Abroug's Classification which is easy to sort the envenomation cases and to compare the severity classes with literature data.

Abroug's classification of severity of scorpion envenomation as follows.

- 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]

Data Analysis was done using Microsoft office Excel software. Statistical analysis was done using SSPS version 21. Prevalence of various demographic and clinical parameters is expressed in proportions.

RESULTS

During the study period, 50 children were admitted to PICU of BKL Walawalkar medical colloge and hospital, Dervan, with scorpion sting (n=50). There was a slight male predominance noted with a male: female ratio of 1.5:1. The peak incidence was noted in the months of April and May. The peaks noted in the age distribution pattern-one at 2 to 5 years category (42%) and the other at 6 to 10 years category (26%) followed by 24% for 0 to 1 year. Pain at the sting site (88%), diaphoresis (62%), vomiting (56%) and restlessness (36%) were the most common presenting symptoms. The common physical signs noted were Tachycardia (78%), Hypertension (58%) and Shock (40%). Priapism was noted in 20% of cases and 22% of cases had hypotension. With regard to severity, 38% of cases presented with Grade II severity, while 32% in Grade I and 30% in Grade III severity were noted. 82% of children received first dose of prazosin within 6 hours and only 2% of children in the study group received first dose of prazosin between 12 to 18 hours of sting and no patient in the study has received the first dose of prazosin after 18 hours. Commonest complication was Peripheral circulatory failure (40%) followed by Congestive cardiac failure (28%). 8 children had pulmonary edema. In Imaging studies, ECG changes were noted in 88% of cases, with sinus tachycardia being the commonest finding (78%). Chest X-ray revealed cardiomegaly and/or features of pulmonary edema in 16% of cases. The mean duration of stay in the hospital was 10 days. There was no mortality due to scorpion sting during the study period.

Table 1: Age

	No. of cases	Percentage
0-1 year	12	24%
2-5 year	21	42%
6-10 year	13	26%
>10 year	04	8%
Total	**50**	**100%**

Maximum number of cases in our study was in the age group of 2 to 5 years. There were total 21 cases in this age group. Next highest number of cases was seen in the age group of 6- 10 years with a count of 13 cases. There were 1 cases in 1st year of life, 4 cases were >10 years.

Table 2: Sex

	No. of cases	Percentage
Male	30	60%
Female	20	40%
Total	**50**	**100%**

Maximum number of patients of poisoning in our study was male patients. There were 30(60.00%) male patients and 20(40.00%) patients were females. The male to female ratio was 1.5.

Table 3: Time of scorpion sting

	No. of cases	Percentage
Day	10	20%
Night	40	80%
Total	**50**	**100%**

maximum patients 40(80%) had scorpion sting at night time and only 10(20%) patients had scorpion sting at day time.

Table 4: Season

	No. of cases	Percentage
January	2	4%
February	3	6%
March	3	6%
April	10	20%
May	9	18%
June	1	2%
July	2	4%
August	1	2%
September	8	16%
October	7	14%
November	5	10%
December	0	0%
Total	**50**	**100%**

Maximum number of scorpion sting cases were presented in April and May 10 (20%) and 9 (18%) respectively followed by September and October 8(16%) and 7(14%) respectively

Table 5: Dobutamin and Prazocin

	No. of cases	Percentage
Dobutamine	32	64%
Prazosine <6 hrs	41	82%
6-12 hrs	8	16%
12-18hrs	1	2%
>18 hrs	0	0%
Total	**50**	**100%**

Total 32 (64%) patients were received dobutamine and 82% patients received 1st dose of prazosine within 6 hours of scorpion sting, 8(16%) patients received prazosine within 6 to 12 hours

Table 6: Presenting symptoms and signs

	No. of cases	Percentage
Pain	44	88%
Sweating	31	62%
Cold extremity	16	32%
Restlessness	18	36%
Vomiting	28	56%
Altered sensorium	9	18%
Convulsions	3	6%
Hypertension	20	40%
Hypotension	11	22%
Tachycardia	39	78%
Bradycardia	5	10%
Shock	20	40%
Priapism	10	20%

Local pain was common symptom and was present in 88% cases. Cold extremities (32%), sweating (62%), restlessness was present in 18 (36%) cases vomiting was presenting in 56% patients, 18% patients were having altered sensorium and 6% had convulsions. Tachycardia was seen in 39(78%) and bradycardia was seen in 5(10%) cases, 40% patients had hypertension and 22% patients had hypotension. 40% had shock and 20% had priapism.

Table 7: Complication

	No. of cases	Percentage
peripheral circulatory failure	20	40%
myocarditis	8	16%
reduced LVEF	14	28%
congestive cardiac failure	14	28%
pulmonary oedema	8	16%
encephalopathy	3	6%

Maximum number (n=28) of cases had normal chest echocardiogram. 8(16%) patients had myocarditis and 14(28%) 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.

Table 8: Severity grading

	No. of cases	Percentage
Grade 1	16	32%
Grade 2	19	38%
Grade 3	15	30%
Total	**50**	**100%**

According to severity grading 19(38%) patients were of grade 2 severity, 32% were of grade 1 and 30% were of grade 3.

Table 9: Prognosis

	No. of cases	Percentage
Recovered	50	100%
Death	0	0%
Total	**50**	**100%**

There were no mortality, all 100% patients were recovered and discharged

DISCUSSION

Maximum number of victims of poisoning in our study was male patients. There were 30(60.00%) male patients and 20(40.00%) patients were females. The male to female ratio was 1.5. Our findings correlate with the study done by Al-Sadoon *et al*[6]., 2003 where the incidence of scorpion sting in males was 61.79 percent. Bansal *et al*[7] had similar results, 210 cases with scorpion sting, 154 (73.33%) were female and remaining 56 (26.67%) were male, as was also

reported by Pol *et al*.[8] and Biswal *et al*.[9] Maximum number of cases in our study was in the age group of 2 to 5 years. There were total 21 cases in this age group. Next highest number of cases was seen in the age group of 6- 10 years with a count of 13 cases. There were 1 cases in 1st year of life, 4 cases were >10 years. Maximum number of scorpion sting cases were presented in April and May 10 (20%) and 9 (18%) respectively followed by September and October 8(16%) and 7(14%) respectively Our study showed that 40 (80%) cases of scorpion sting occurred during night time whereas only 10 (20%) were reported during daytime, which was in line with the results of Pol *et al*.[8] who stated that most of the bites occurred during the night time (164 [68.3%]). This might be because scorpions are nocturnal arthropods, unable to tolerate high temperature. Thus, they protect themselves from heat during daytime by sheltering under rocks or debris. Total 32 (64%) patients were received dobutamine. 82% patients received 1st dose of prazosine within 6 hours of scorpion sting, 8(16%) patients received 1st dose of prazosine within 6 to 12 hours. Local pain was common symptom and was present in 88% cases. Cold extremities (32%), sweating (62%), restlessness was present in 18 (36%) cases which is similar to pol *et al*.[8] vomiting was presenting in 56% patients, 18% patients were having altered sensorium and 6% had convulsions. Our study correlates with the study done by Himmatrao saluba *et al*.[10], 2012. Vomiting is due to autonomic storm often seen in a patient envenomed scorpion. Vomiting is due to serotonin content of venom (Tiwari *et al*., 2009).[11] Profuse sweating: sweat literally flows all over body clinically it is called "skin diarrhoea". Sweating persist for 3-17 hours (Bawaskar and Bawaskar, 2000). Tachycardia was seen in 39(78%) and bradycardia was seen in 5(10%) cases. In this study tachycardia was present in maximum number of cases. Our study correlates with the study done by Himmatrao saluba *et al*.[10] 2012, tarchycardia occurs due to the action of excessively circulating catecholamine 5 and their action on beta adrenergic receptor (Bahloul *et al*., 2010)[12], 40% patients had hypertension and 22% patients had hypotension. which is similar to the study done by Bosnak *et al*.[13] and Pol *et al*. 40% had shock and 20% had priapism. Hypertension was commonest blood pressure finding seen in 20(40%) of cases. 11(22%) cases had hypotension. Normal blood pressure was present in 19(38%) cases. Our study correlates with the study done by Himmatrao saluba *et al*.[10], 2012 stimulation of alpha adrenergic receptor is the main reason for development of hypertension (Freire-_maia *et al*., 1994)[14].

CONCLUSION

Scorpion stings are more common in males. Maximum patients are in age group of 2 to 5 years. Stings are more at the night time. Local pain, sweating and vomiting are the commonest symptom. Tachycardia, hypertension and shock are common signs. Myocarditis and pulmonary oedema and encephalopathy are rare complication which are treatable.

BIBILOGRAPHY

1. Sarthi M. *et al*. Clinical Study of scorpion sting envenomation. Int J Contemp Pediatr. 2019 May; 6(3): 1154-1157.
2. Singhal A. *et al*. Epidemiology, Clinical Presentation and Final Outcome of Patients with Scorpion Bite. Journal of clinical and diagnostic research. 2009; June; 3(3): 1523 - 1528
3. Tarachand saini *et al*. Scorpion Bite Causing Acute Severe Myocarditis: A Rare Complication. Indian Journal Of Clinical Practice, vol 23,No 3, 2012.
4. Jagannathan *et al*. Clinical profile and outcome of scorpion sting envenomation in children admitted in a tertiary care hospital. Journal of Evolution of Medical and Dental Sciences Jul, 18, 2016.
5. Ganesh J. *et al*. A study on the clinical profile of scorpion envenomation in children. Int J Contemp Pediatr 2016 Feb; 3(1):125-128.
6. Al-Sadoon, M.K. And Jarrar, B.M., 2003. Epidemiological study of scorpion stings in Saudi Arabia between 1993 and 1997. J. Venom. Anim. Toxins include. trop. Dis., 9: 54-64.
7. Bansal *et al*. Clinical profile of scorpion sting from north Uttar Pradesh, India. International Journal of Medical Science and Public Health. Jan 15
8. Pol R, Vanaki R, Pol M. The clinical profile and the efficacy of prazosin in scorpion sting envenomation. J Clin Diagnos Res 2011;5(3):456-8.
9. Biswal N *et al*. Outcome of scorpion sting envenomation after a protocol guided therapy, Indian J Pediatr, 2006,73;577-82.
10. Bawaskar *et al*. Scorpion sting updates Dec 27 19:21:54 2011
11. Tiwari *et al*. Role of serotonergic mechanism in gastric contractions induced by Indian red scorpion *(Mesobuthus tamulus)* venom. Indian Journal of Pharmacology: 2009: 41(6): 255-257
12. Bahloul M. *et al*. Scorpion envenomation among children: Clinical manifestations and outcome. Am J Trop Med Hyg. 2010;83:1084–92.
13. Bosnak M *et al*. Scorpion sting envenomation in children in southeast Turkey.Pubmed.gov; 2009;20(2):118-Freire-Maia L, Campos JA, Amaralk CF. Approaches to the treatment of scorpion envenoming. Toxicon 1994; 32: 1009-1014.

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