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Scorpion sting among children with respect to its complications and outcome

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ABSTRACT

Background: Scorpion sting is an acute time limiting medical emergency commonly encountered in rural villages of the country. It is a major public health problem in many tropical and sub tropical countries. India is most affected country in Asian epidemiological data.
Objectives: This study was done to study the complications and outcome of scorpion sting in children.
Setting and design: This is a prospective observational study.
Materials and Methods: a total of 100 cases of scorpion sting selected from the patients admitted to Vijayanagar Institute of Medical Sciences, Ballari. The demographical features, clinical presentation, complications, outcome and the response to standard treatment protocol were observed and analysed.
Results: Scorpion sting is a common and major health problem in our area. Most commonly affected age group was 4-6 years (27%), and male children (67%) were most commonly affected. These cases were most commonly seen during March (15%) to May (14%) months. Pain at the site of sting (99%) and excessive sweating (92%) were most common presenting complaints, cold extremities (88%), tachycardia (84%), and restlessness (72%) were most common signs noted. Most common complication was myocarditis (15%), followed by pulmonary edema (7%) and encephalopathy (2%). About 98% of cases recovered without sequelae and 2% of cases died due to complications.
Conclusion : Scorpion sting is a serious, potentially fatal emergency in our area. Cardiovascular manifestations are most common and are life threatening complication. Administration of prazosin as early as possible is the single most effective intervention to prevent complications and mortality

1. Introduction

Scorpion sting is an acute time limiting medical emergency commonly encountered in rural villages of the country.[1] Although scorpion sting is a major public health problem, often neglected and is not included under notifiable diseases.[2]

Only about 30 of the estimated 1,500 species of scorpions produce venom toxic enough to be fatal.1 Globally around 1.5 million envenomation cases occur every year with a mortality of 3000 per year.[3] In majority of children specially in rural area seek local or traditional treatment, which further worsens the outcome.

In tropical and sub tropical countries like India, Sahara Africa, Middle east, Mexico and south Latin America, pose major public health concern due to scorpion sting.[4] India is most affected country in Asian epidemiological data with reported incidence of 0.6%, which is less than the actual number of cases. As scorpion sting is not included under notifiable diseases, the actual burden is likely to be underestimated.[2]

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Scorpions tend to habitat in dry, hot climatic regions like Maharashtra, Andhra Pradesh, Karnataka, Gujarat, and Uttar Pradesh. Most of the scorpion species have nocturnal activity, hide during the day under woods or stones, cow dung, paddy husks, shoes left empty over night, pockets of trousers and shirt, carving, crevices of windows and doors5. Generally don't bite unless rough handled.

Delay in timely reporting to hospital contributes to significant morbidity and mortality which could be due to false belief, poor transport system and far of places.

Complications due to scorpion sting mainly occur because of irrational unscientific, traditional treatment taken locally and also due to administration of unhelpful treatments like steroid, atropine, histamine and ACE inhibitors which often complicate and prolong the recovery.[2]

Timely intervention with appropriate treatment hastens the recovery. Hence there is urgent need to create awareness among the people of rural regions of the country.

2. Materials and Methods

This prospective observational study was in 100 children with history of scorpion sting admitted to Pediatrics emergency Department, VIMS Ballari from January 2019-December 2019. Permission for the study was obtained from the College Institutional Ethics Committee prior to commencement.

2.1. Inclusion criteria

1. Eye witnessed cases of scorpion sting will be enrolled in the study group.
2. Age group: 0 – 12 years.
3. Clinical history suggestive of scorpion sting.

2.2. Exclusion criteria

1. Eye witnessed cases of other bite.
2. Age group > 12 years.
3. Who are not willing to participate.

2.3. Method of collection of data

Data will be collected by all patients presenting with history of scorpion sting by face to face interview of both mother and child and clinical examination will be carried out after taking informed consent from mother.

3. Results

Out of 100 cases, maximum number of cases were noted in age group of 4-6 years(30%), followed by 1-3 years(27%). The youngest case noted was a 5 months old infant.

Scorpion sting was most common in males due to their exploratory behavior. Out of 100 scorpion sting cases, 73% of cases were from rural area.

Maximum number of cases (42%) were seen in summer (March, April, May), and in early winter (September) seasons.

Stings due to Mesobuthus species i.e. Red scorpion (74%) were more common than stings due to Palamneus species i.e. Black scorpion (23%).

Most common site of sting is lower limbs (55%), followed by upper limbs (35%), trunk (6%), face and scalp (4%).Table 1

Most of the stings occurred during night between 7 pm to 12 am (34%), followed by early morning between 7 am to 12 pm (27%). About half of the cases presents by 4-6 hours after sting (51%), in remaining half of the cases usually presents between 1-3 hours after sting (42%), 2% of the cases presented after 6 hours and 5% of the cases presented within 1 hour of sting.

Most common presenting complaints are pain (99%), sweating (92%), cool extremities (88%), burning sensation (82%), vomiting (47%), excessive salivation (31%), priapism (23%), irritability (20%), giddiness (17%), and headache (16%). Table 2

Most common physical findings are cold extremities (88%), tachycardia (84%), restlessness (72%), and hypotension (65%) followed by priapism (23%), tachynoea (9%), hypertension (8%), cyanosis (7%), and altered sensorium (4%). Table 3

Most common complication associated with scorpion sting is myocarditis (15%), followed by pulmonary edema (7%) and encephalopathy (2%). Table 4

About 98% of cases recovered without sequelae and 2% of cases died due to complications. Table 5

Table 1: Site of sting

Site of sting	No. of cases	Percentage
Upper limb	35	35%
Lower limb	55	55%
Trunk	06	6%
Face & scalp	04	4%

Table 2: Presenting complaints

Presenting complaints	No. of cases	Percentage
Pain	99	99%
Burning sensation	82	82%
Sweating	92	92%
Irritability	20	20%
Vomiting	47	47%
Headache	16	16%
Giddiness	17	17%
Excessive salivation	31	31%
Cool extremities	88	88%
Priapism	23	23%

Table 3: Physical signs

Signs	No. of cases	Percentage
Tachycardia	84	84%
Tachypnoea	09	9%
Hypertension	08	8%
Hypotension	65	65%
Cold extremities	88	88%
Cyanosis	07	7%
Restlessness	72	72%
Altered Sensorium	04	4%
Priapism	23	23%

Table 4: Complications

Complications	No. of cases	Percentage
Myocarditis	15	15%
Pulmonary edema	07	07%
Encephalopathy	02	02%

Table 5: Prognosis

Prognosis	No. of cases	Percentage
Recovered	98	98%
Death	02	02%

4. Discussion

Maximum number of cases were noted in age group of 1-6 years (57%). Number of cases who are <1 year is 2%, 1-3 years is 27%, 4-6 years is 30%, 7-9 years is 21%, and 10-12 years is 20%. Yuval Cavari et al, in 2015 reported a series of 185 cases of scorpion sting and reported a similar age distribution.[5] Children aged 1-6 years are more exploratory and tend to wander outside, hence are more susceptible to scorpion sting.

In our study there was male preponderance (67%). In a study conducted by R V Bharath et al, also tells that scorpion sting is more common in males.[6] Various studies also noted male preponderance. This is because boys go out more commonly than girls and play outside. Boys are more exploratory, and risk taking behaviour also attributes to higher incidence among boys. Further, older boys are frequently involved in agriculture work posing risk for scorpion sting.

In our study about 73% of cases were from rural area. Scorpions are usually found in tropical and sub tropical areas, and dry and hot climatic regions.

Most common species of scorpion in India is red scorpion, which is most toxic and is associated with fatal complications. M M. Patil et al, in their study on Scorpion sting envenomation, Vijayapur, Karnataka, India also found that Indian red scorpion Mesobuthus Tamulus is the most common scorpion species found in this region and is the most toxic type known.[7]

Scorpions are generally found in dry, hot environments. About 42% of cases were reported in March to May followed by 14% of cases reported in September. V Ebrahimi et al, conducted a study on predictive determinants of scorpion stings and concluded that scorpion sting cases were more common in summer.[8] Many other studies also consistent with this finding which indicate association between scorpion sting and climatic factors like temperature and relative humidity.

Most common site of sting is lower limb (55%), followed by upper limbs (35%), trunk (6%), and face and scalp (4%). This is comparable to many other studies which also showed extremities are the most common site of scorpion sting. Most of the cases were stung in extremities as scorpions take shelter under the bark of trees, dry firewood or cow dung, piles of bricks, paddy husk, beddings, loose tiles of the hut, shoes left empty overnight, pockets of trousers and shirt, carving, crevices of windows and doors. Hamid Kassiri et al, has done Epidemiological Survey on Scorpion Sting Envenomation in South-West, Iran and this study revealed that the most prevalence of scorpion sting occurred on feet and hands.[9]

Scorpions are nocturnal organisms and they hide during day time. So most of the scorpion sting cases reported in night time (34%), followed by early morning (27%). Many studies were also reported nocturnal sting. K. Arivoli et al, in the study on the clinical profile of scorpion envenomation in children reported 76% of cases with nocturnal sting.[10]

About half of the cases (51%) presented within 4 – 6 hours after sting, 42% of cases presented within 1 -3 hours, only 5% presented within 1 hour, and 2% cases presented after 6 hours which is associated with fatal complications.

Time lapse between scorpion sting and presentation greatly influences the outcome of scorpion sting. A study on the clinical profile of scorpion envenomation in children by Ganesh J et al, also concluded that 76% of children presented to health care and received first dose of prazosin between 4 - 8 hours.[11]

Most common presenting complaints are pain – localized radiating (99%), sweating (92%), cool extremities (88%) and burning sensation (82%). Other common complaints are vomiting (47%), excessive salivation (31%), priapism (23%), irritability (20%), giddiness (17%), headache (16%). Abdulrahman K. Al- Asmari et al, studied Scorpion sting syndrome in a general hospital in Saudi Arabia and concluded that local symptoms (47.4%), hypertension (37.9%), sweating and salivation (34.3%) and tachycardia (31.9%) had the highest records.[12]

Most common physical findings are cold extremities (88%), tachycardia (84%), restlessness (72%), and hypotension (65%) followed by priapism, tachypnea, hypertension, cyanosis and altered sensorium. H S Bawaskar study on diagnostic cardiac premonitory signs and symptoms of red scorpion sting shows that Profuse sweating, mydriasis, vomiting, and peripheral circulatory failure were seen.[13]

Most common complications associated with scorpion sting is myocarditis (15%), followed by pulmonary edema (7%) and encephalopathy (2%). Niranjan Biswal et al, studied outcome of scorpion sting envenomation after a protocol guided therapy and concluded that complications were due to excessive parasympathetic and sympathetic stimulation. Myocarditis was observed due to the toxin and excessive catecholamine, which complicated in left ventricular failure (LVF) and acute pulmonary edema (APE). Nearly half of the children with acute myocarditis developed APE. [14]

Most of the cases recovered (98%), and only 2% of cases died due to scorpion sting. The mortality and morbidity has significantly reduced after the invent of prazosin. Bawaskar study on the management of severe scorpion sting at rural settings in India, shows that since the advent of prazosin, the fatality due to severe scorpion sting is reduced to less than 1%.12 boys probably go outside more commonly and play in places where scorpions live, and their higher inquisitive nature and risk-taking behavior. Boys probably go outside more commonly and play in places where scorpions live, and their higher inquisitive nature and risk-taking behavior. Boys probably go outside more commonly and play in places where scorpions live, and their higher inquisitive nature and risk-taking behavior. [15,16]

Conclusion: It was concluded that majority of stings were by Red scorpion. Most of the scorpion sting cases were during summer season. Time lapse between times of sting to presentation was the determinant of outcome. Delay in administration of prazosin plays a major role in complications associated with scorpion sting.

Though majority of children received prazosin beyond 4 hours of sting, 98% of children with scorpion sting improved completely and only 2% of children died due to myocarditis with pulmonary edema.

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None.

6. Conflict of Interest

None.

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