Short Communication

Clinical profile of scorpion sting from north Uttar Pradesh, India

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Abstract

Background: Scorpion sting envenomation is an acute life-threatening, time-limited medical emergency, commonly seen in villagers. Among the 86 species of scorpions identified in India, *Mesobuthus tamulus* and *Palamnaeus* are of medical importance. Morbidity and mortality due to scorpion sting are related to acute pulmonary edema, cardiogenic shock, and multiorgan failure.

Objectives: To evaluate the pattern of presentation and the primary care to be taken to avoid mortality.

Materials and Methods: A total of 210 patients of consecutive scorpion sting were prospectively studied. The data included demographics, the time of presentation to the hospital (Jeevan Jyoti Hospital, Allahabad, Uttar Pradesh, India), and clinical features.

Results: Local pain, sweating, and tachycardia were the common clinical presentations. The red scorpion sting was seen in 60% cases, and the site of sting was found to be the foot region in 61% cases.

Conclusion: Scorpion sting is an acute life-threatening emergency, and an early presentation to the hospital. We advocate that a prevention method in the form of a health education program carried out by health-care workers.

KEY WORDS: Scorpion sting, pain, tachycardia, pulmonary edema

Introduction

Scorpion envenomation is a public health problem, common in certain areas of the world including Middle East, Latin America, Africa, and India.[1] Scorpion sting is an acute life-threatening, time-limiting medical emergency, more commonly seen in villagers.[2]

Around 2000 species of scorpions are present worldwide. In India, only two species, *Mesobuthus* (red) and *Palamnaeus* (black), are poisonous scorpion. *Mesobuthus tamulus* or the Indian red scorpion is the most lethal scorpion species.[3] Although the incidence of scorpion stings is higher in adults, the severity of envenoming is significantly greater in children, in whom the case fatality rate is up to 10 times higher than in adults.[4]

Morbidity and mortality due to scorpion sting are related to acute pulmonary edema, cardiogenic shock, and multiorgan failure. The clinical manifestations of scorpion envenomation are vomiting, profuse sweating, cold extremities, pulmonary edema, and death.[5] The deaths in scorpion sting envenomation are attributed to cardiopulmonary complications such as myocarditis and acute pulmonary edema.[6]

Envenoming accidents occurring in villages of tropical and subtropical countries and many countries including India were not modifiable, hence the actual statistical data are scarce. Thus, the aim of our study was to evaluate clinical manifestation and management of scorpion sting.

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Materials and Methods

From February 2012 to August 2014, a prospective study was conducted in patients with scorpion sting admitted to the intensive care unit (ICU) of Jeevan Jyoti Hospital, Allahabad, Uttar Pradesh, India. The diagnosis was based on positive history of scorpion sting, with scorpion being seen or killed by relatives or bystanders.

In all the patients, history was evaluated, and physical examination with a specific neurological examination and routine biochemical testing and fundus examination were done to specifically look for changes in the retinal vessels due to longstanding hypertension. Vitals were recorded on arrival and thereafter at every 1-h interval. Electrocardiogram was recorded to detect any evidence of scorpion sting–induced myocarditis and to detect any evidence of left ventricular hypertrophy due to longstanding hypertension. Treatment of scorpion sting was done according to protocol and direction for line of treatment.

Results

A total of 212 patients of scorpion sting were admitted in hospital during February 2012 to August 2014, in which 2 patients died before the start of any treatment, that is, on the way to the ICU. In these two patients, neither patient nor relatives have seen scorpion. Of 210 cases of scorpion sting, 154 (73.33%) were female and remaining 56 (26.67%) were male. Red scorpion sting was predominant (60.0%) over the black (34.8%) and with unknown color (5.2%). The most common site of scorpion sting was foot (61.0%) followed by hand (22.3%), body (12.0%), and neck (0.4.7%). The cases with sting during nighttime were more (75.2%) than during daytime (21.0%) and at unknown time (3.7%). History of scorpion sting was found only in 42 (20%) patients whereas no history of sting was found in 80% cases [Table 1].

Clinical Presentation

Patients who came late had the features of excessive sympathetic activity (i.e., tachycardia, intense vasoconstriction, and carditis). Those patients who presented immediately after the sting (within 30 min) had the features of parasympathetic hyperactivity (i.e., sweating, salivation bronchospasm, and vomiting). All these symptoms indicated the autonomic storm at presentation. The most common presenting symptoms were irritability and sweating, hurried breathing, and cold extremities followed by an altered sensorium. The most common clinical signs were tachycardia, tachypnea, cold extremities, perspiration, and hypotension [Table 2]. A majority of cases approached the hospital after 6–12 h of the scorpion sting.

On analysis of clinical presentation after scorpion sting, a majority of patients have pain (92.38%), tachycardia (20.95%), restlessness (15.23%), sweating (12.85%), vomiting (8.57%), hypertension (7.14%), pallor (3.80%), fever (1.90%), dyspnea (1.90%), semiconsciousness (1.42%), dehydration (0.95%), arrhythmia (0.95%), bradycardia (0.48%), hypertonic muscle (0.48%), and shock (0.48%), but none of the patients have been presented with convulsion, cyanosis, hypotension, pulmonary edema, and dilated pupils [Table 2].

Factor Affecting Symptom of Scorpion Sting

The color of scorpion and sting sites was shown to affect the severity of sign and symptoms. Our results showed that red color scorpion sting presented significant increased pain, but black scorpion sting showed significant systemic manifestation, and a patient who underwent the shock might have the black scorpion sting.

The most common site of sting is found to be foot followed by hand, body, and neck, respectively. The sting in neck region was associated with shock, hypertension, and systemic manifestation than the sting at other sites [Table 3].

Table 1: Details of scorpion sting site in cases

Characteristic	Number (*n* = 210)	Percentage
Color of scorpion		
Red	126	60.0
Black	73	34.8
Unknown	11	05.2
Site of sting		
Foot	128	61.0
Hand	47	22.3
Body	25	12.0
Neck	10	04.7
Time of sting		
Day	44	21.0
Night	158	75.2
Unknown	8	03.8
Prior sting		
Yes	42	20.0
No	168	80.0

Table 2: Clinical presentation of case with scorpion stings

Sign and symptom	Number (*n* = 210)	Percentage
Pain	194	92.38
Vomiting	18	8.57
Fever	4	1.90
Sweating	27	12.85
Shock	1	0.48
Semiconsciousness	3	1.42
Restlessness	32	15.23
Convulsion	0	0.00
Hypertonic muscle	1	0.48
Pallor	8	3.80
Cyanosis	0	0.00
Tachycardia	44	20.95
Arrhythmia	2	0.95
Bradycardia	1	0.48
Hypertension	15	7.14
Hypotension	0	0.00
Dyspnea	4	1.90
Pulmonary edema	0	0.00
Dehydration	2	0.95
Dilated pupils	0	0.00

Table 3: Sting factor affecting the sign and symptom

Sting factor	Localized pain (*n* = 162)	Systemic manifestation (*n* = 32)	Hypertension (*n* = 15)	Shock (*n* = 1)	*p*-Value
Color					
Red (*n* = 126)	109	11	6	0	<0.005
Black (*n* = 73)	48	18	6	1	
Unknown (11)	5	3	3	0	
Site of sting					
Foot (*n* = 128)	106	19	3	0	<0.005
Hand (*n* = 47)	34	7	6	0	
Body (*n* = 25)	18	3	4	0	
Neck (*n* = 10)	4	3	2	1	

Discussion

Venom of the Indian red scorpion (*M. tamulus*) is a potent sodium channel activator,[7] resulting in the stimulation of the autonomic nervous system, which in turn leads to the sudden release of endogenous catecholamines into the circulation.[1] The venom initially leads to a transient cholinergic phase, followed by sustained adrenergic hyperactivity, which is a venom dose–dependent phenomenon.[8] The clinical manifestations depend on the dose of the venom, the age of the individual, the season of the sting, and the time lapse between the sting and hospitalization.[5]

In our study, most of the patients were with red scorpion sting (60%), whereas a study by Pol *et al*.[9] showed that red scorpion sting was predominant (72.9%).

Of 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*.[9] and Biswal *et al*.[10]; 128 (61.0%) cases had the sting over the foot-leg region, which was approximately similar (68.3%) to that reported by Pol *et al*.[9] and Bosnak *et al*.[11] Therefore, a well-planned health education program can be useful in preventing sting by advocating the use of shoes and taking care while handling stones, debris, cloths, and bedsheets.

Our study showed that 158 (75.2%) cases of scorpion sting occurred during nighttime whereas only 44 (21%) were reported during daytime, which was in line with the results of Pol *et al*.[9] who stated that most of the bites occurred during the nighttime (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.[12]

In our study, 194 (92.38%) patients were having pain, which was similar to that reported by Pol *et al*.[9] Restlessness (15.23%) and sweating (12.85%) were the second most common clinical signs found in our study. We have not found any patients with hypotension, but it was reported by Pol *et al*.[9] and Bosnak *et al*.[11]

The patients were admitted to our hospital with cardiogenic shock, respiratory distress, hypoxia, and pulmonary edema. All patients were reported after 6–18 h of scorpion sting as their condition deteriorated at peripheral hospital. For them, early prazosin medication was recommended to prevent pulmonary edema. Antivenom was not given to any of the patients without prior skin test. Treatment with steroids and antihistamines before admission was associated with poor outcome, but it was prescribed due to low side effect and absence of antivenom or latest facility.

Conclusion

The high incidence of red scorpion sting was found in north Uttar Pradesh, India. The site of sting was predominantly the foot region and during nighttime. Scorpion sting envenomation is an acute life-threatening emergency, and timely referral and early therapy with prazosin may be life saving. This suggests that the prevention program reduces the incidence of scorpion sting.

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