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Assessment of scorpion bite in children of north Indian hospital with respect to clinical aspects

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Abstract
Scorpion stings are painful. Many may go through minor problems like swelling, tingling or numbness due to the sting. A bark scorpion sting can cause severe symptoms, as its venom is more potent. The high incidence of red scorpion sting was found in north Indian region. The site of sting was predominantly the foot region and during night time. Scorpion sting envenomation is an acute life-threatening emergency, and timely referral and early therapy with prazosin may be lifesaving. This suggests that the prevention program reduces the incidence of scorpion sting.
The study was planned in Department of Paediatrics. The Inclusion Criteria is the Children's below 12 years of age reported with confirmed scorpion sting bite. The exclusion Criteria of the present study is children's admitted with unknown bite. The total 50 patients found positive for the scorpion sting admitted to the hospital were enrolled in the present study.
There is lack of adequate emergency medical facilities. This can lead to high morbidity and mortality rate of scorpion envenomation in rural areas. Hence based on above findings study had been planned in Nalanda Medical College and Hospital regarding the clinical profile of the scorpion bite.

Keywords: scorpion stings, clinical profile, bite, etc.

Introduction
Scorpion stings are a cutaneous condition caused by the stinging of scorpions, usually resulting in pain, parenthesis, and variable swelling. The anatomical part of the scorpion that delivers the sting is called a "telson" [1, 2].
Scorpion stings are painful. Many may go through minor problems like swelling, tingling or numbness due to the sting. A bark scorpion sting can cause severe symptoms, as its venom is more potent. Young children and older adults may require immediate treatment. The factors that may increase the risk of scorpion stings are location, environment, season and travel. Scorpions are found in the deserts of Arizona, Mexico, South America, north and South Africa, Middle East and India. Another factor is the environment. Bark scorpions, commonly known as house scorpion and can be hiding in the firewood, bed linen, clothes, garbage pails, and shoes. Scorpions are more likely to be seen during spring and summer. It is more likely to encounter dangerous scorpions when on a hike or camping.
Scorpions are a member of the Arachnida class and are closely related to spiders, ticks, and mites. Scorpions have two pincers, 8 legs and an elongated body with a tail composed of segments; they range in length from about 9 to 21 cm. Some species are smaller, more translucent, and harder to see. They may appear as a thin string on the ground. The last tail segment contains the stinger (also termed a telson) that transmits a toxin to the recipient of a sting. Most scorpions are harmless. Although about 2000 species exist, only about 25-40 species can deliver enough venom to cause serious or lethal damage to humans. One of the more venomous or potentially dangerous species, especially for infants, young children, and the elderly in the United States is Centruroides exilicauda or bark scorpion. Contact with scorpions is usually accidental. Scorpion stings are painful, and they can be fatal, particularly to children. Scorpions may sting more than once; the stinger, located at the end of the tail segment is usually not lost or left in the person's tissue after a sting.
Scorpions come in a variety of colors - from tan to light brown to black. Each has a long tail segment that contains a stinger. Scorpions are found in highest numbers across the southern United States and in arid or desert regions in most other countries. However, they can be found occasionally in most US states and in temperate regions of both South America and Africa and some even reside in cold climates. Scorpions hunt at night and hide along rocks or trees during the days. Homes built in arid or desert regions commonly have scorpions in them. In 2015, there were reports of airline passenger(s) being stung in flight. The planes were landed before reaching their destinations to rid the aircraft of the scorpion(s).
Most scorpion stings cause only localized signs and symptoms, such as pain and warmth at the site of the sting. Sometimes these symptoms may be quite intense, even if you don't see redness or swelling [3].
Signs and symptoms at the site of the sting may include:
- Pain, which can be intense
- Numbness and tingling in the area around the sting
- Slight swelling in the area around the sting

Signs and symptoms related to widespread (systemic) venom effects usually occur in children who are stung and may include:
- Difficulty breathing
- Muscle twitching or thrashing
- Unusual head, neck and eye movements

- Drooling
- Sweating
- Nausea and vomiting
- High blood pressure (hypertension)
- Accelerated heart rate (tachycardia) or irregular heart beat (arrhythmia)
- Restlessness or excitability or inconsolable crying (in children)

As with other stinging insects, such as bees and wasps, it is possible for people who have previously been stung by scorpions to also have allergic reactions with subsequent stings. These subsequent stings are sometimes severe enough to cause a life-threatening condition called anaphylaxis. Signs and symptoms in these cases are similar to those of anaphylaxis caused by bee stings and can include hives, trouble breathing, and nausea and vomiting.

There is lack of adequate emergency medical facilities. This can lead to high morbidity and mortality rate of scorpion envenomation in rural areas. Hence based on above findings study had been planned in north Indian Tertiary care hospital regarding the clinical profile of the scorpion bite [4].

Methodology

The study was planned in Department of Paediatrics. The Inclusion Criteria is the Children's below 12 years of age reported with confirmed scorpion sting bite. The exclusion Criteria of the present study is children's admitted with unknown bite. The total 50 patients found positive for the scorpion sting admitted to NMCH were enrolled in the present study.The aim and the objective of the study are conveyed to all patients. The approval of the institutional ethic committee had been taken before the study. All the patients were informed consent.

After study parameters, social demographic parameters like age, gender, place of residence, time of bite, location where bite has occurred and site of bite. Clinical parameters included heart rate, respiratory rate, blood pressure, oxygen saturation, sensorium, priapism., salivation, vomiting, sweating, cold extremities and pupil size. Laboratory parameters considered were blood sugar, chest x-ray, ECG, echocardiography etc.

Results & Discussion

The data on the various parameters were collected and presented as below. The social demographic parameters like age, gender, place of residence, time of bite, location where bite has occurred and site of bite were evaluated. Clinical parameters included heart rate, respiratory rate, blood pressure, oxygen saturation, sensorium, priapism. salivation, vomiting, sweating, cold extremities and pupil size also considered in the study population. The laboratory parameters considered were blood sugar, chest x-ray, ECG, echocardiography etc. The data were collected and presented as below.

Table 1: General Info

Age	No. of Cases	Percentage
Less than 1 year	3	6
1- years	33	66
5 – 12 years	14	28
Sex		
Male	39	78
Female	11	22
Geographic Origin		
Rular	45	90
Urban	5	10
Color of scorpion		
Red	30	60
Black	17	34
Unknown	3	6
Site of Sting		
Foot	35	70
Hand	10	20
Body	5	10
Time of Sting		
Day	12	24
Night	38	76

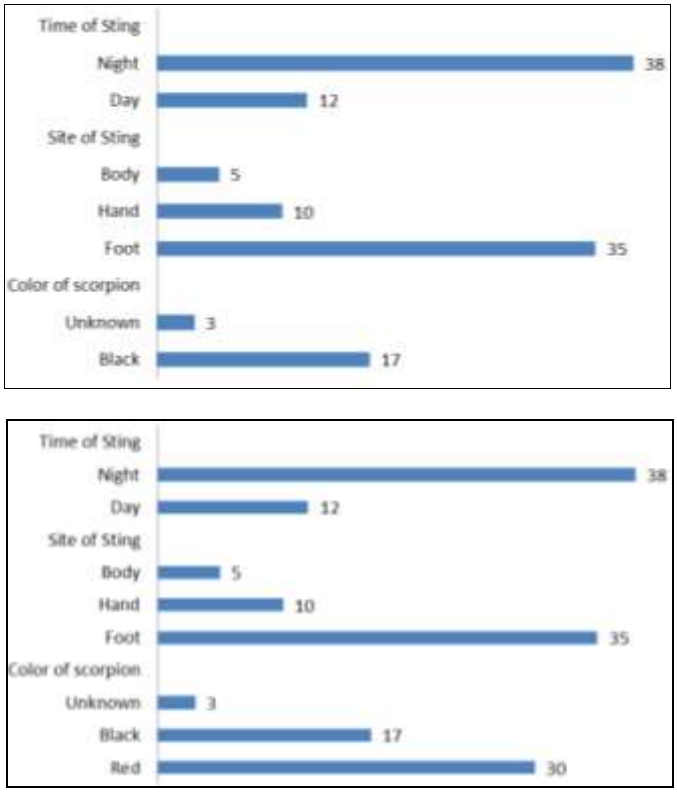

Fig 1: General Info

Table 2: Symptoms Observed

Symptoms	No. of Cases	Percentage
Pain at the site of sting	48	96
Swelling	8	16
Salivation	20	40
Vomiting	23	46
Priapism	18	36
Restlessness	22	44
Diaphoreses	33	66
Cold extremities	45	90
Breathlessness	6	12
Altered sensorium	1	2
Convulsion	3	6
Hypotension	30	60
Hypertension	4	8
Bradycardia	6	12
Tachycardia	21	42
Hyperglycemia	42	84

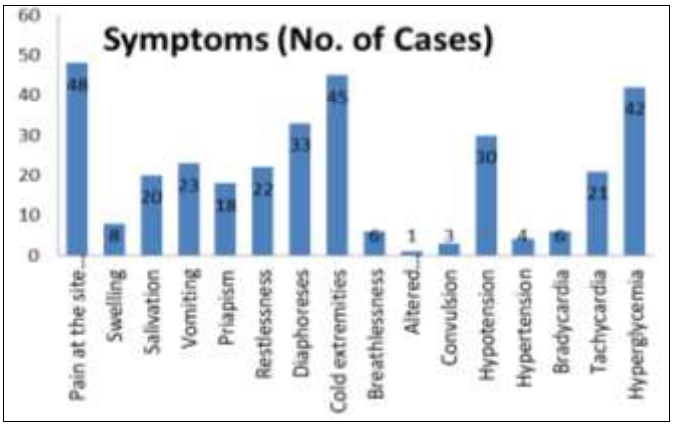

Fig 2: Symptoms Observed

Table 3: Observation during hospitalization

Characteristics	No. of Cases	Percentage
Abnormal CXR		
Cardiomegaly	18	36
Pulmonary edema	3	6
Abnormal ECG		
Sinus tachycardia	33	66
Wide QRS complex	8	16
Abnormal ECHO		
Cardiac dilatation	15	30
Reduced LVEF%	12	24
Shock management		
None	45	90
NS bolus	2	4
Inotropes	2	4
Need for respiratory support		
None	46	92
CPAP/MV	3	6
Duration of stay in hospital		
Less than 3 days	40	80
More than 3 days	10	20

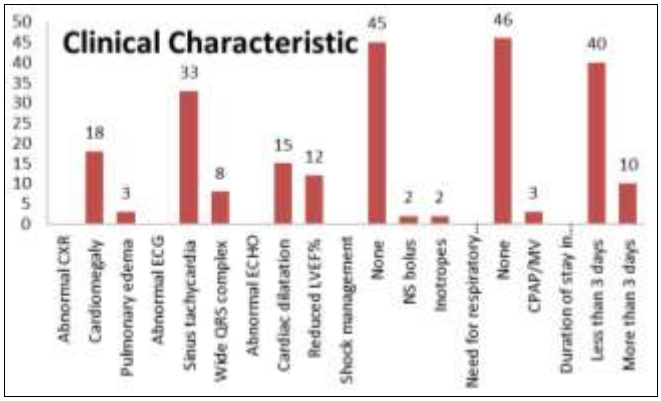

Fig 3: Clinical Characteristics

The socio-demographic factors and the factors like age of incidence, outdoor bites, extremities being the commonest site of sting, seasonal increase of cases were comparable to various studies [5-6]. Admission of more than 50% of cases are of Class - I in our centre may be unique to semi-urban centre's which serve round the clock and depicts the mind set and awareness of patients to reach to a higher centre in case of envenomation.

Pain is the commonest symptom which ranged between within few minutes to hours. ECG helps in diagnosis of fatal conduction disturbance, ischemia and very importantly tachycardia is the commonest finding usually seen with in first 4 hours and may persist for 24-72 hours. Bradycardia was noted in only 6 patients at admission but Biswal *et al*. reported bradycardia in 3.5% of cases [5 & 6]. Priapism was noted in nearly 18 of male children. But Bawaskar *et al*. has noted occurrence of this clinical symptom in as many as 10% of patients and hyperglycemia was documented in 42 of our cases, and this is similar to studies by Balasubramaniam *et al* [7-8].

Children who received steroid and antihistaminics had a higher mortality than the cases who did not receive any treatment. Even in those who received prazosin when along with steroid and antihistaminics had a significantly higher mortality, than those who did not receive any drugs before admission [9]. Antihistaminics and dexamethasone alone or in combination are known to potentiate the effect of catecholamine in CVS and CNS and worsen encephalopathy cases died in our study were of similar case situations.

Conclusion

The high incidence of red scorpion sting was found in north Indian region. 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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