

Epidemiological and Clinical Characteristics of Scorpion Stings in Ahwaz, Southwest Iran (2006-2010)

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ABSTRACT

Background: Scorpion sting is a health problem in the world including tropical regions of Iran as in rural region of Khuzestan province. Therefore appropriate diagnosis and treatment has a special aspect. The aim of present study was to evaluation of demographic status and clinical aspect of scorpion sting patient due to better prevention and treatment and diagnosis.

Methods: This survey done by analyzing medical records of patients suffered from scorpion sting, hospitalize in Razi hospital in Khuzestan province (southwest of Iran) among 2006-2010. Patient information have been extracted and inserted in the inquiry form and data were analyzed by SPSS software.

Results: In the present study 1922 patients have been studied. Proportion of females stung by scorpion to male was 1.29 to 1. Place of sting were mostly trunk (693 cases =36.05%) and remains were on other part of body. About 419 persons (21.8 %) have come to hospital about 6-24 hours after being stung and 708 people (36.83 %) came there in less than 6 hours. Most sting (41.2 %) were at night time and other were at daylight. 1308 persons were stung by an unknown black and yellow scorpion and 614 cases (31.94%) by scorpion known as *Hemiscorpius lepturus*. 708 persons of patients (39.83%) have been suffered from hemoglobinuria , 709 persons (39.88%) were suffered from coagulation dysfunction. Totally 508 persons of patients (26.43%) received blood products. 36 of patients were died, of which 24 cases (1.24%) were female and 12 patients (0.62%) were male. most of patients (1842 cases 95.83%) were hospitalized 1-2 days.

Conclusion: In this survey, Patients at the emergency units showed signs of local and systemic effects, 36 patients were died. We propose that public awareness and physician readiness combined with the availability of effective antivenom has potential value in reducing complications and lethality in scorpion envenomation.

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► *Implication for health policy/practice/research/medical education:* Epidemiological and Clinical Characteristics of Scorpion Stings

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1. Introduction:

Scorpions are medically important arthropods of the class Arachnida that commonly found in hot and dry environments (1). They are generally nocturnal and emerge after sunset, taking cover during the day under rocks, in crevices, or within burrows. Scorpions have various lengths ranging from 13 to 220 mm and their morphologic structures are easily identifiable (2, 3).

In the world, approximately 1500 species of scorpions are described; about thirty of them are recognized as potentially dangerous for humans (4). The scorpion stings are the most important cause of arachnid envenoming and are responsible for significant morbidity and pediatric mortality in many tropical and subtropical regions including the Middle East, Central and South America, Asia and northern and southern Africa (5, 6).

Scorpion envenomation is a major public health problem in Iran that provokes numerous deaths, especially in the southwest region (7). The incidence and severity of clinical effects of stinging scorpions depending on the species of scorpion, the biting animal physiological conditions, the number of bites, and the amount of venom injected, and the age, weight and health of a person is bitten. Clinical effects may vary, from a simple response to local pain, severe systemic reactions, appearing even in the some cases lead to death (8). Chemical composition contained in scorpion's venom that associated with sex, species, biological condition and animal nutrition, most important role in the occurrence and severity of clinical symptoms. Scorpion stings in the spring and summer, more than other seasons

(9). The most dangerous scorpions in Khuzestan province are *Hemiscorpius lepturus* scorpions, locally known as Gaodim (10). Victims of envenoming by a scorpion suffer a variety of clinical disorders, involving mainly both sympathetic and parasympathetic stimulation as well as central manifestations such as irritability, hyperthermia, vomiting, profuse salivation, tremor, and convulsion. Their bites can lead to hemolysis, acute renal failure, disorders of the nervous system, cardiovascular disorders, edema, blisters, ecchymosis, and local tissue destruction. Death occurs due to respiratory failure or cardiac arrest with ARF and intense neurological symptoms (11). This scorpion is in charge of 10-15% in the Ahwaz (center of Khuzestan province) (12).

This study aimed to describe epidemiological characteristics of scorpion envenomation in the region of Khuzestan, southwest of Iran, during 2006–2010, where health care is relatively more accessible.

2. Materials and Methods:

This retrospective study was conducted during 2006- 2010 in the Razi hospital, primary poisoning care administration of Khuzestan province in Ahwaz, and included 1922 patients who utilized this department and presented envenomation by scorpion sting or who showed compatible clinical symptoms. The study protocol was reviewed and approved by the Institutional Ethics Committee.

Clinical and epidemiological data were obtained from medical records of the Razi hospital and comprised demographics, gender, species of scorpion, sting characteristics, time elapsed between sting and admission to the hospital, clinical symptoms from the moment of arrival until the patient was released from the hospital. Details of treatment, envenomation evolution and any complications were also registered. The data was analyzed using the

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Statistical Package SPSS version 18.0. Chi-square and Fisher's test were applied for statistical analysis with the level of significance set at $P < 0.05$.

3. Results:

Table 1 presents epidemiological characteristics of persons stung by scorpions. In this retrospective study which included 1922 scorpion envenomed patients who were admitted to the poisoning center of Razi hospital of Ahwaz between 2006 and 2010. 614 (31.94%) of victims were stung by *H. lepturus*, and 324 (16.85%) cases were stung by unknown yellow scorpion, and 187 (9.72%) by unknown black scorpion, and the

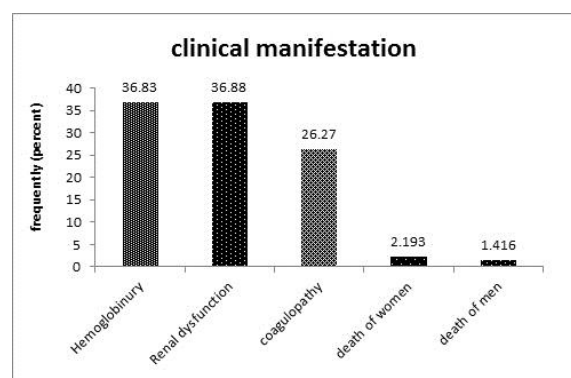


Fig. 1. Incidence Rates of clinical manifestation in patients with scorpion sting in Razi hospital in 2006 - 2010 (n = 1922).

remaining (897 persons=46.67%) were due to other scorpion species. collected Data showed that scorpion stings occurred mainly

Table 1: Frequency distribution of the variables in patients with scorpion sting in Razi hospital in 2005-2010 (n=1922)

Variable	Sub-group	Frequently (%)
Gender	Female	1093 (56.86)
	Male	847 (44.6)
Time of stinging	5 - 12 a.m	251 (13.05)
	12-16 p.m	442 (22.99)
	16-20 p.m	437 (22.73)
	20 p.m -5 a.m	792 (41.2)
Location of stinging	Head and neck	359 (18.67)
	Upper extremities	501 (26.06)
	Trunk	693 (36.05)
	Lower limbs	369 (19.19)
Time from scorpion stinging to admission (hours)	6 hours \geq	807 (36.83)
	6-24 hours	419 (21.8)
	24hours \leq	795 (41.36)
Species of scorpion	Gadim	641 (31.94)
	Unknown yellow scorpion	324 (16.85)
	Unknown black scorpion	187 (9.72)
	Other scorpion species	897 (46.67)

at afternoon between 12-20 p.m (879 cases=45.72%) and night between 20 p.m.-5 am (792=41.2 % of cases). between 12-16 p.m. (22.99% of cases) and early morning 5 and 12 a.m. (18.6% of cases). Table 1 displays the demographic characteristics of reported scorpion sting cases. The time between the scorpion sting and called on hospital was variable in 1922 cases. Most of the patients (795 persons=41.36%) called on hospital 24 hours after the sting, while 708 cases (36.83%) referred less than 6 hours after stinging and 419 patients (21.8%) called on within 6-24 hours. Recorded data showed that the incidence of scorpion sting was higher in women and 1093 cases (56.86%) of all hospital referred scorpion poisoning were women. Male-to-female ratio was 1.9:1.

The frequency of stings in trunk 693 cases (36.05%) and upper extremities 501 cases (26.06%) was significantly different from those in head and neck 359 cases (18.67%) and Lower limbs 369 cases (19.19%). Within the scorpion envenomed patients, different clinical symptoms were observed. As shown in figure 1, the most common symptom of poisoning was haemoglobinuria in 708 cases (36.83%). Other clinical manifestations were seen included coagulation disorder in 709 cases (36.88 %) and renal failure in 505 cases (26.27%). 508 persons (26.43%) required administration of blood products.

Among 1922 patients, 36 persons (1.87%)

passed away and remained survived. Of these 24 cases (1.24%) were female and 12 patients (0.62%) were male. Additionally, Most of the patients 1842 cases (95.83%) were confined to bed within ICU between 1-2 days.

4. Discussion:

The scorpionism is an actual public health problem in several parts of the world because, either incidence, or severity of envenomation is high and managed with difficulty by health services, or for these two reasons at the same time. The treatment of scorpion envenomation is complex and controversial, in particular regarding the utility of the antivenoms and symptomatic treatments that should be associated (8, 13).

In the present study, female victims predominated over male ones (56.86 versus 44.6%). Several reports had similar results and indicated that females accounted for the majority of victims (14-16). The majority of stings occurred at night between 20 p.m. to 5 a.m. Also most stings occur on the trunk. Dehghani *et al.* study showed that at least 7 important scorpion species are found in Khuzestan with varied prevalence (17). In our study the majority of the victims were unaware about of scorpion species but a lot of people mentioned they have been stung by Gaodim. Most patients required hospitalization in the ICU, furthermore 26% of patients were requires blood transfusion. A wide variety of symptoms and signs were

Table 2: Frequency distribution of clinical measures done for patients with paraquat poisoning admission in Razi hospital in 2006 - 2010 (n = 1922)

Clinical measurement	Sub-group	Frequently (%)
Require for ICU admission	yes	1842 (95.83)
	No	80 (4.17)
Require for blood transfusion	Yes	508 (26.43)
	No	1414 (73.57)

observed in victims but hemoglobinopathies and renal dysfunction were the most common clinical manifestations in these patients. Among the 1922 studied cases, 11 deaths were registered; it is considerable that the rate of mortality was higher in women.

Several studies have been done about epidemiological and clinical manifestation of scorpionism around the world (7, 18, 19). In similar study Adiguzel *et al* investigated the epidemiological and clinical characteristics of scorpionism in children in Sanliurfa, Turkey. Their finding showed that the sting cases mostly occurred in the summer (37.6%). Scorpion species causing the envenomation in children were not identified. More of the patients were adolescents (54.1%). Most of the stings were seen in exposed extremities (87.7%), mainly in the upper limbs (47.1%). One single village, Birecik, had the highest number of incidents (36.5%). Patients at the emergency units showed signs of local and systemic effects, but no lethality occurred. Local and autonomic nervous system effects were most frequently characterized by local pain, hyperemia, swelling, burning, hypotension, hypertension, dry mouth, thirst and sweating (18).

In another study performed by Chowell *et al* epidemiological and clinical characteristics of scorpionism in Colima, Mexico was investigated. Their finding indicated that most common symptoms were local pain (94.7%), local paresthesia (67.2%), pruritus/itching (54.3%), sensation of a lump or hair in the throat (47.3%), and sialorrhoea (27.7%). The median time from sting to admission to the emergency room (patient delay) was 33 minutes (interquartile range: 12–60). They found that older and clinically severe patients were significantly associated with longer times of admission to the emergency room. Age was significantly associated with clinical severity: the age group 0–10 years included a higher proportion of severe cases than the group 11 years and older. In four cases, patients died (19).

5. Conclusion:

This analysis indicated that, scorpionism is a serious health problem in Khuzestan region, which needs to be monitored carefully by the government. We also conclude that additional research on the scorpion fauna and their morphological, ecological and molecular variety in this region as well as the correlation between scorpions' species and the clinical signs and symptoms is needed. Finally, with respect to the out coming results, increasing knowledge of residents regarding the prevention methods of scorpion stings is recommended.

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