

Epidemiologic study of scorpion sting in patients referring to Kashan medical centers during 1991-2002

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ABSTRACT

Background: Scorpions are widely distributed in Iran. Kashan city has a suitable climate for these creatures (especially Butidae species). The present study was designed to determine the epidemiological picture of scorpions in Kashan.

Materials and methods: In this descriptive study, medical files of all patients bitten with scorpion during 1991-2002 were reviewed.

Results: Totally, 367 cases were bitten during the studied period, of whom 67% were male and 33% were female with a mean age of 23.1±15.1 years. Children aged <9 years were the most commonly affected group (36.5%), while lower limbs were the most commonly bitten site (64.3%). Most of the patients suffered from inflammation and pain, and unfortunately, 7 cases of death due to scorpion bite were reported.

Conclusion: Scorpion sting-associated illness was quite common in Kashan during the study period, therefore, preventive tools and suitable educational programs, especially at schools, are required to alleviate the probable problems.

Keywords: Scorpion, Epidemiology.

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INTRODUCTION

Scorpions belong to invertebrates' branch and are armed with a hard and stiff membrane. Their venomous organ as a keen sting is located at tip of a long jointed tail; including two poisonous glands that are positioned in a thick capsule. The poison is a protein that in its pure and fresh condition is colorless and transparent and its PH is at neutral or alkaloid level.

The clinical symptoms in scorpion sting are typically varied, depending on factors such as

scorpion's species, amount of injected poison, season, age and physical conditions of injured patient that may be weak as brief local responses or so dangerous as severely physiological changes that are led to death (1,2).

After scorpion sting the clinical signs and symptoms include blood pressure changes, irregular respiration, over-sweating, nausea, vomiting, hypersalivation, vertigo, anxiety, confusion, convulsion, renal abnormality, internal hemorrhage, abdominal pain, chills, fever, weakness, palpitation, hypotension, restlessness, mental abnormality and death (3,4).

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Oliver conducted the first attempt in study about scorpion in Iran. In 1807, he described Kashan's scorpion species in his travel minutes. After that other studies have been conducted and investigated scorpions in Kashan and other regions of Iran (5).

In a research by Valerio et al, totally 8 species of scorpions were reported, all belonging to Butidae family. The black breed is nominated *Androctonus crassicauda* and yellow species are named *Compsobutus matthiesseni*, *Mesobuthus eupeus*, *kraepelinia palpator*, *polisicus persicus*, *compsobuthus kaftani*, *iranobuthus krali*, *Mesobuthus vesiculatus* (6).

Regarding the abundance spreading of scorpion sting disease in Kashan region and the absence of an overall study on clinical and epidemiological aspects of this disease, this study was conducted in Kashan.

PATIENTS and METHODS

For this descriptive study, medical files of patients bitten by scorpion were reviewed. Patients were referred to Kashan medical centers during 1991-2002.

The initial data including age, sex, signs and symptoms, site of biting, probable type of the scorpion and final outcome of the patients were derived and recorded in a previously prepared questionnaire, then analyzed.

RESULTS

Totally, 367 cases were bitten by scorpion during 1991-2002. Children aged <9 years were by far the most commonly affected group (36.5%), however, few patients belonged to the age group of >70 years (3.5%). Most of the cases were male (67.1%). Table 1 presents age and sex distribution of patients bitten by scorpion in Kashan.

Furthermore, most of the sufferers were bitten during night (65.4%), and in summer season (60.8%).

Table 1. Frequency distribution of scorpion sting among various age groups according to the sex

Age (year)	Female (%)	Male (%)	Total (%)
0-9	36(29.7)	98(39.8)	134(36.5)
10-19	26(21.5)	48(19.5)	74(30.3)
20-29	14(11.6)	32(13.0)	46(12.5)
30-39	13(10.7)	12(4.9)	25(6.8)
40-49	7(5.8)	24(9.8)	31(8.4)
50-59	5(4.1)	10(4.1)	15(4.1)
60-69	14(11.6)	15(6.1)	29(7.8)
>70	6(5.0)	7(2.8)	13(3.8)
Total	121(100)	246(100)	367

The study implies that all of the patients had shown inflammatory and painful symptoms, 57 (15.5%) had restlessness and 55 (14.9%) had cardiac symptoms. In 2 cases (0.5%) intravascular coagulation, 4 cases (1%) convulsion and 4 cases (1%) pulmonary problems observed. Moreover, 7 (1.9%) patients died of whom 4 were female and 3 were male. Table 2 represents signs and symptoms of the patients.

Table 2. Frequency distribution of signs and symptoms of patients bitten by scorpions in Kashan

	Female(%)	Male (%)	Total (%)
Inflammatory focal symptoms	121(100)	246(100)	367(100)
Irritability	31(25.6)	26(10.5)	57(15.5)
Headache	10(8.3)	14(5.6)	24(6.5)
Shock	10(8.3)	7(2.8)	19(5.1)
Fever and chill	7(5.7)	10(4.0)	17(4.6)
Agitation/confusion	7(5.7)	5(2.0)	12(3.2)
Tingling sensation	5(4.2)	7(2.8)	12(3.2)
Death	4(3.3)	3(1.2)	7(1.9)
Renal symptoms	2(1.7)	5(2.0)	7(1.9)
Respiratory symptoms	2(1.7)	2(0.8)	4(1.0)
Seizure	2(1.7)	2(0.8)	4(1.0)
Intravascular coagulopathy	2(1.7)	-	2(0.5)

Of 367 scorpion bites, 236 (64.3%) occurred in lower limbs, 102 (27.8%) in upper limbs, 27 (7.4%) in trunk and 2 (0.5%) in head and neck area (table 3). Most of the sufferers (58.3%) resided in rural.

Table 3. Frequency distribution of scorpion sting according to the bitten site

	Female (%)	Male (%)	Total (%)
Lower limb	82(67.7)	154(62.6)	236(64.3)
Upper limb	23(19.0)	79(32.1)	102(27.8)
Trunk	14(11.6)	13(5.3)	27(7.4)
Head and neck	2(1.7)	-	2(0.5)
Total	121(100)	246(100)	367

Of 367 patients, 360 (98.1%) received adequate immediate medical management, while 7 (1.9%) died. Most of the sufferers were bitten during July (27.5%), August (21.5%) and June (17.4%), while January encompassed the least frequency (0.4%). Meanwhile, most of the subjects (62.1%) were bitten inside their houses. Black species were the most commonly reported scorpions (34.9%); however, 72 patients (19.6%) were bitten by yellow species and 45.5% of the cases failed to show the responsible scorpion.

DISCUSSION

The vast majority of sufferers aged 0-9 years. Attamo study in Nigeria showed that half (50%) of the sting cases happened among 6-15 years old subjects (7). Osnaya et al. reported that in Mexico most of the scorpion bitten cases were children, especially boys (8). Their findings are in consistent with ours. Perhaps a high prevalence of insect bitten during childhood is due to their unawareness. Compared with adults, children wear shoes scarcely and sleep sooner than adults at night; so they are unable to protect themselves against scorpion activities climax time.

Furthermore, our study showed that scorpion sting was more common among men. In Osnaya and Pardal studies in Mexico and Brazil, 63% and 83.3% of referred patients were male (8,9). Higher frequency of scorpion sting among male could be in part explained by their outside careers (working in farms, etc.).

Most of the patients were bitten during night hours since scorpions are active during these hours.

Like Farghaly study in Egypt, most of our cases occurred during summer (10). Attamo et al. have also reported 52% of stings to take place during July and August (7). Further scorpion activity during warm summer period and the tendency of people to sleep outdoors during these months could explain this condition.

In our study, all patients complained of inflammatory focal symptoms such as pain, burning sensation and paresthesia. Other symptoms included restlessness, headache, cardiac problems, convulsion and pulmonary symptoms. In a study on 225 scorpion-bitten patients in Israel, Bentar et al. reported 13% of cases without any symptoms, 72% had mild symptoms while 15% had severe systematic symptoms (11). The most common symptoms were pain (97.2%), cardiac problems (23.1%), and ECG abnormalities (13.7%) (11). In Osnaya study none of the patients died, partly due to prompt antivenin administration (8); however, they had reported the following symptoms: local pain, redness, drooling, restlessness, nausea, irritability, paresthesia and dysphagia. Similarly, Pardal et al. surveyed 72 scorpion sting cases and described the following manifestations: focal symptoms (91.7%), pain (52.8%), systemic symptoms (88.6%), CNS abnormalities (97.2%) and electrical shock (88.9%) (9). The aforementioned studies are in agreement with ours.

Like our study, Attamo et al reported lower limbs to be bitten in 66% of their patients (7). This could be in part explained by wearing unsuitable shoes at yard and field.

Moreover, 58.3% of our patients were residing in rural areas. This is in agreement with Farghaly et al (10). Unsuitable construction materials as well as old and broken houses provide a suitable environment for scorpions.

We have found black and yellow scorpions to be the causative insect in 34.9% and 19.6% of our patients, respectively. Attamo report was as follow: black (18%), yellow (18%), brown (5%) and unknown species (59%) (7).

In summary, scorpion sting-associated illness was quite common in Kashan during the study period, therefore, preventive tools and suitable educational programs, especially at schools, are required to alleviate the probable problems.

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