

Study of scorpionism in Kashan in central Iran

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ABSTRACT

Objective: The present research study was conducted to get new information due to the epidemiology of scorpionism in the region of Kshan, central of Iran.

Methodology: This was a descriptive retrospective study. Totally 230 files, belonging to the patients presented to the health centre and hospitals of city of Kashan during one year (March 22nd 2007 - March 21st 2008) were reviewed. In a questioner, this information was included and recorded for each patient: sex and age of scorpion sting victim, background of patient, antivenin treatment, month of scorpion sting, scorpion-stung part of body, color of scorpion and geographical place (rural/urban). The frequencies of epidemiological parameters were converted to the percentage rank.

Results: The incidence of scorpion sting in Kashan is calculated as 58 persons in hundred thousand (100,000). The results of this study show that the most of scorpion-stung patients were males (53.04%) and the rest were females (46.95%). The distribution rate of ages shows that the greatest rate of scorpion stings were reported among the 15-24 year old people. Data collected in this study revealed that the highest incidence of scorpion sting cases took place in summer (75.7%) and the lowest in winter (0.4%). Totally 73.91% of scorpion sting victims were from urban areas and the rest (26.08%) were from rural areas of Kashan. The scorpions brought to the Medical Centres by the patients or their relatives were identified as *Odonthobuthus doriae*, *Hotentta saulcyi*, *Compsobuthus* sp., *Androctonus crassicauda* and *Orthochirus* sp. of Buthidae and *Scorpio maurus* of Scorpionidae in Kashan of Iran.

Conclusion: It is concluded that the scorpionism in Kashan is similar to the other areas from the epidemiological cases including: distribution rate of ages, sex and site of stings. Existence of *Hemiscorpius lepturus* causes more clinical effects among people of south west of Iran than Kashan area.

KEY WORDS: Scorpionism, Buthidae, Scorpionidae, Kashan, Iran.

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INTRODUCTION

Scorpionism, scorpion sting, is a world-wide spread phenomenon but It is a considerable health problem in the tropical and subtropical regions.¹ Scorpion envenomation is an important health problem in some regions of Iran especially in south-west, south and central due to ecological conditions including geographical locations, climate and socioeconomical structure. Scorpionism is creating many suffering conditions for the local people including socioeconomical problems such as emigration and loss of job in addition to clinical problems such as hospitalization and death.²⁻⁶

Among 1500 species of scorpions which have been described, venoms of 50 species are dangerous for human and most of these species belong to genera *Buthus*, *Parabuthus*, *Mesobuthus*, *Tityus*, *Leiurus* and *Androctonus* of Buthidae and *Hemiscorpius* from Hemiscorpiionidae.⁷ There are some of those genera such as *Mesobuthus* and *Androctonus* in central of Iran. However there are more genera including: *Odonthobuthus*, *Hotentta*, *Compsobuthus* and *Orthochirus* of Buthidae and *Scorpio* of Scorpionidae in the central of Iran.^{8,9} Considerable epidemiological studies on scorpion stings have been performed in several countries, such as Morocco, Tunisia, Algeria, Iran, Brazil and Mexico.¹⁰

Information about scorpion envenomation in Iran is focused on south-west and south regions however the rate of scorpion stings in the other areas of Iran are still fragmentary and very little. One of these areas is central of Iran, including Kashan, Aran and Bidgol where the present retrospective surveying of scorpion sting was conducted academically and entomo-epidemiologically for the first time there. These regions, special Kashan are recognized for their scorpion beings in contrast there is no documented information regarding scorpionism there. Information of scorpionism has been called only for the species recognizing not for scorpion sting epidemiology. Therefore the present study was conducted to get information due to scorpionism in these regions from epidemiological point of view. This will enable the local authorities make plans to reduce and eliminate scorpion sting among the residents of these regions.

METHODOLOGY

This was a descriptive retrospective study. The data of the present research has come from files of outpatient or hospitalized persons referred to the

health centre and hospitals of city of Kashan during one year (March 22nd 2007 - March 21st 2008). In the current study the data of scorpion stings was studied from the epidemiological aspects included: sex and ages of scorpion sting victims, background of patients, antivenin treatment, month of scorpion sting, scorpion stung part of body, color of scorpions, geographical place (rural/urban). The information was recorded in a questioner. The results are presented as graphs and tables. The frequencies of epidemiological parameters were converted to the percentage rank.

RESULTS

A total of 230 files, belonging to the patients who presented to the health centre and hospitals of city of Kashan during one year (March 22nd 2007 - March 21st 2008) were reviewed. The incidence of scorpion sting in Kashan is calculated as 58 persons in hundred thousand (100,000) during one year (March 22nd 2007 - March 21st 2008). Totally 73.91% of scorpion sting victims were from urban areas of Kashan and the rest (26.08%) were from rural areas of Kashan (Table-I).

The results of this study show that the most of scorpion-stung patients were males (53.04%) and the rest were females (46.95%), totally. The scorpion stung male patients (55.29%) was greater than females (44.71%) in the urban areas. This is in contrast to rural areas where the rate of female scorpion stung people (53.33%) is greater than males (46.66%) (Table-I).

The distribution of ages of the scorpion victims is presented in the Table-II which shows that the greatest rate of scorpion stings were observed among the 15-24 year old people, however the lowest rate of scorpion stings were reported as 1.6% among the

Table-I: Percentage of scorpion sting cases based on the months and geographical regions of Kashan hospitals and Health Centre, 2006-2007

Scorpion stingsMonth	Urban areas		Rural areas		Total	
	Female	Male	Female	Male	No	%
April	2	2	2	2	7	3
May	6	3	1	1	11	4.8
June	5	9	4	1	19	8.3
July	13	41	6	6	66	28.8
August	24	20	12	10	71	30.9
September	17	9	5	6	37	16
October	5	4	2	2	13	5.6
November	3	1	1	--	5	2.2
December	--	--	--	--	--	--
January	1	--	--	--	1	0.4
Total	76	94	32	28	230	100
Percentages	33	40.9	13.9	12.2		

Table-II: Age distribution of scorpion sting cases based on the sex Kashan hospitals and Health Centre, 2007-2008

Age Sex group	Male		Female		Total	
	No	%	No	%	No	%
0-4	2	0.8	2	0.8	4	1.6
5-9	7	3.1	1	0.4	8	3.5
10-14	10	4.4	7	0.8	12	5.2
24-15	32	14	26	11.3	58	25.3
35-44	19	8.3	19	8.3	38	16.6
54-45	8	3.4	11	4.8	19	8.2
64-55	6	7.7	6	7.7	12	5.2
≤65	10	4.4	14	6	24	10.4
Total	122	53.2	108	46.8	230	100

0-4 year old patients.

Data collected in this study revealed that the highest incidence of scorpion sting cases took place in summer (75.7%) and the lowest in winter (0.4%) (Table-I) in Kashan region. The most scorpion sting cases were in the month of August and the lowest to January; however this rate was recorded zero in the December, February and March (Table-I). Legs, as the lower parts of the body were targeted by scorpion stings of cases more than the other parts (46.5%), hands with 44.8% and head and trunk with 8.7%.

Out of 230 scorpion sting cases, 88.7% recovered without using antivenin serum and 11.3% got better with injection of antivenin serum, 23 cases intra venin and 3 cases intra-muscular. No death was reported in the present study.

The records of stung patients described the scorpions as yellow or black in the recent study. The yellow scorpions were recorded in 68.3% of cases and the black scorpions 31.3% of cases. The rest (0.4%) were not recorded. The scorpions brought to the medical centers by the patients or their relatives were identified as *Odonthobuthus doriae*, *Hotentta saulcyi*, *Compsobuthus* sp., *Androctonus crassicauda* and *Orthochirus* sp. of Buthidae and *Scorpio maurus* of Scorpionidae in Kashan of Iran.

DISCUSSION

The results of this study indicated that there were 230 cases of scorpion stings in Kashan during year of 2008. It means that the incidence of scorpionism was 58 cases in hundred thousand (100,000) in 2008. This is similar to the average of scorpion sting in Iran. The rate of scorpion sting cases have been expected

more than recent observed data in Kashan area according to the regional climatologic condition of which belonging to a warm and arid climate. It is suggested that high grade awareness of local people and authority from health problems including scorpionism is the reason of this lower rate of scorpion stings which is leading to the better function of pest control.

Data collected in the current study revealed that the highest incidence of scorpion sting cases took place in summer (65.7%). This is in accordance with the studies of Vazirianzadeh et al.¹¹ and Chitnis et al.¹² in Iran, Jarrar and Al-Rowaily¹³ and Al-Sadoon and Jarrar¹⁴ in Saudi Arabia, Ozkan et al.¹⁵ and Ozkan and Kat¹ in Turkey. They have reported that 49.7% - 93.4% of scorpion sting cases occurred in summer. These differences were presumably due to the variation of geographical, climatologic and species distributions.

Results of this study show that most of scorpion-stung patients were males (53.04%) and the rest were females (46.95%). It means that the males were under greater risk of scorpion sting than females in Kashan. This is in accordance with results of Jarrar and Al-Rowaily¹³ and Al-Sadoon and Jarrar¹⁴ in Saudi Arabia. However, these results are in contrast to the results of Vazirianzadeh et al.¹¹, Vazirianzadeh and Samie¹⁶ and Chitnis et al.¹² who have reported no difference between males and females among the patients referred with scorpion stings to the hospitals during a six month survey. However, they have reported that females were in the greater risks of scorpion stings than males in an earlier study and it was supported by job data of Vazirianzadeh and Samie.¹⁶ Housewives were dominant in the Vazirianzadeh and Samie¹⁶ study as a women job. Then it is suggested that the epidemiology of scorpion sting related to the sex of scorpion sting cases not only is varied according to the job status but also according to the year and location of study.

Another important epidemiological factor which is revealed in the current research is where scorpion sting cases have occurred: rural or urban area. It is reported that 73.5% of scorpion sting cases were in the urban area of Kashan in this research. It agrees with the results of Vazirianzadeh et al.¹¹ in south-west of Iran. They have reported that nearly 60% of scorpion stings have occurred in the urban area. The results of Pipelzadeh et al.¹⁷ presented scorpion sting cases in Khuzestan with 57% of victims from urban area comes in agreement with the above results, supporting that the scorpionism in Iran is going to be an urban health problem.

The greatest rate of scorpion stings was observed among the 15-24 year old people, and the least were reported as 1.6% among the 0-4 year old patients in this study. This is in agreement with the findings of Emam et al.¹⁸ and Ghaderi et al.¹⁹ However pooled age data of 15-24 and 25-34 year old as one group of 15-34 year old included nearly half the scorpion stung patients because this age group included the busiest age group. Then this age group was in the greater risk group of scorpion sting than the other groups.

The results of this study also revealed limbs as the moving parts of human being are in the greater risk of scorpion stings than the head and trunk. This explains that work health cares, including suitable wears, are an important issue for reduction of scorpion sting cases. This confirms the finding by Jarrar and Al-Rowaily¹³ and Al-Sadoon and Jarrar¹ in Saudi Arabia.

The recorded species of scorpions in this study are similar to the studies conducted in Khuzestan, South-west of Iran.^{5,6,11,16} The remarkable species difference in Kashan with Khuzestan is related to the existence of *Hemiscorpius lepturus* only in Khuzestan as one of the most dangerous species of scorpion in the world. This is the major cause of medical problem from scorpion sting in SW of Iran. This is a good reason for lower scorpionism problem in Kashan too. The existence of species in Kashan area cause less clinical effects than clinical effects of scorpion species of Khuzestan in men.

CONCLUSION

It is concluded that the scorpionism in Kashan is epidemiologically similar to the other area including: distribution rate of ages, sex and site of stings. Lower rate of scorpion sting cases in Kashan than south west of Iran should be due to different fauna of scorpions. Existence of *Hemiscorpius lepturus* causes more clinical effects among people of south west of Iran than Kashan area. Use of antivenin serum among the scorpion-stung people and getting 11.3% recoveries is another reason for reduced clinical effects among the patients. Another reason related to the less injuries and no mortality may be due to the distribution of jobs of Kashan people which was not studied in this research. Therefore it is suggested that the distribution of jobs of Kashan people should be considered. To continue reduction in the rate of scorpion sting among people of Kashan, education regarding to scorpionism among people, emphasizing on females and 15- 35 age group of people will be an important step.

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