



Epidemiological aspect of scorpion sting in Bandar Abbas, Iran, during 2009-2011

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Abstract

Introduction: People in tropical and semi-tropical areas are in danger of scorpion sting, and this can be a serious problem for them. Mortality due to scorpion sting in the tropical and semi-tropical areas of Iran is about 75%, and this makes scorpion sting in these areas a serious medical problem. Because of this problem, our aim was to assess the epidemiological aspects of scorpion sting in Bandar Abbas, Iran, during 2009-2011.

Methods: In this cross-sectional retrospective study, epidemiologic data of 698 scorpion sting cases, who were referred to the Shahid Mohamadi Hospital of Bandar Abbas in Hormozgan Province collected from 2009 until 2011. The data included demographic and individual information, such as age, gender, geographic location, bite site, when the incident occurred, and anti-venom consumption. The required data were extracted from the patients' recorded information in the Hospital, and we recorded data in a special checklist and imported the data into the computer for statistical analysis using of SPSS software, version 21.0. Descriptive statistics, including mean, standard deviation, frequency, and percentage, were used for data analysis.

Results: Two hundred and sixty-one (37.4%) of the cases were urban and 437(62.6%) were rural. Males comprised 50.1% of the cases, and women comprised 49.9% ($p > 0.05$). Twenty-five point two percent of scorpion sting cases occurred among people in the 21 to 30 age group, and there were very few cases among people in the 51 to 60 age range ($p < 0.05$). Most of cases were recorded in April and October, and the fewest cases were recorded in July and January ($p < 0.05$); also 32.2% of scorpion sting cases occurred after midnight and in the early morning hours.

Conclusion: Our survey showed that there was a high incidence of scorpion stings in rural areas, among 21-30 age group, among housekeepers, and among students. These results indicate the need for public education programs and better sanitation services in the rural areas around Bandar Abbas city. Prospective studies can help to health and medicine organization for prevention and treatment of scorpion sting.

Keywords: scorpion sting, Bandar Abbas, epidemiology, Iran

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1. Introduction

1.1. Background

Scorpion sting can cause death (1). People in tropical and semi-tropical areas are in danger of scorpion sting, and this can be serious problem for them, especially for the two ends of the age spectrum (2). Because of the favorable climate for scorpions in Hormozgan Province, there are various families of scorpions active in the area, including Buthidae, Scorpionidae, and Hemiscorpiidae. More than 20 species have reported in this area (3-7).

1.2. Statement of problem

In west and southwest of Iran, scorpion sting is one of the medical problems. Razi Serum Institution's studies have shown that the most mortality due to poisoning are from scorpion stings (8). The mortality rate associated with scorpion sting in the tropical and semi-tropical areas of Iran is about 75%, and this makes scorpion sting in these areas a serious medical problem. Khuzestan, Sistan Baloochestan, Charmahal Bakhtiari, Bushehr and Hormozgan Provinces have more reported scorpion sting cases than anywhere else in Iran (9-11). More than 2,300 cases of scorpion sting per year occur in Hormozgan Province, and most of the cases are in Bandar Abbas County. Between 2011 and 2014, four deaths of children less than five years old occurred due to scorpion sting in Bandar Abbas. This study tries to clarify the epidemiologic status of scorpion stings in Hormozgan Province in the absence of any past epidemiologic studies.

1.3 Objectives

The general objective of the current study was to report the epidemiological aspect of scorpion sting in Bandar Abbas, Iran, from 2009 through 2011. Specific objectives included the following:

- 1) To determine the epidemiological aspect of scorpion sting according to the age
- 2) To determine the epidemiological aspect of scorpion sting according to the job
- 3) To determine the epidemiological aspect of scorpion sting according to the month
- 4) To determine the epidemiological aspect of scorpion sting according to the period of 24 hours
- 5) To determine the epidemiological aspect of scorpion sting according to the sting site

2. Material and Methods

2.1. Study area

Hormozgan Province is located in the south of the country, and it has a 900-km border with the Persian Gulf and Oman Sea. This Province has a subtropical climate, and it has two different areas, i.e., coastal plain in south and a mountainous area in the north. Bandar Abbas is the main port of the country. The study area was located in the mountainous and coastal part of Bandar Abbas county with a surface area of 10,359 km² located in southern Iran (between 26° 53'- 27° 31' N latitude and 54° 53'-56° 30' E longitude). The county has four districts, i.e., the Central district, Fin, Thakht and QalehQazi. The county includes 336 officially registered localities, such as villages and rural areas. In the 2009 census, the Bandar Abbas County's population was 588,228, from this population 139,427 (23.7%) were rural vicinities. The major portion of the Province has mountainous terrain, with the southern sector of the Zagros Mountain Range stretching out from the northwest to southeast. The total annual rainfall is in the range of 100-150 mm, and the mean annual relative humidity is 59.5%. The maximum and minimum mean annual temperatures are 49 and 6 °C, respectively.

2.2. Sampling and data collection

All the scorpion sting cases who were referred to the Adult and Pediatric Central Hospital of Bandar Abbas from 2009 through 2011 were included in the study. In this cross-sectional retrospective study, the epidemiologic data of 698 scorpion sting cases were statistically analyzed. The data included demographic and individual information, such as age, gender, geographic location, sting site, the time the sting occurred, and the consumption of anti-venom.

2.3. Measurement tools

The required data were extracted from the patients' recorded information in the hospital. Data for each patient were recorded in a special checklist and imported into the computer for statistical analysis.

2.4. Research ethics

The information about the patients was kept confidential. Also, the information was extracted without name by using codes. This study was approved by the Research Ethics Committee of Hormozgan University of Medical Sciences (ethic code: HUMS.REC.1394.83).

2.5. Statistical analysis

Data was analyzed using SPSS software, version 21. Descriptive statistics, including mean, standard deviation, frequency, and percentage were used for data analysis.

3. Results

In this study, 698 scorpion sting cases were studied. Two hundred and sixty-one (37.4%) of the cases were urban, and 437(62.6%) were rural. The urban-to- rural ratio of scorpion stings was 1/67. Among these people, 50.1% were male, and 49.9% were female. Twenty-five point two percent of scorpion sting cases occurred among people whose ages were from 21 to 30, and 20.2% occurred among people whose ages ranged from 11 to 20. The fewest cases occurred for people in the age range of 51 to 60 ($p<0.05$) (Table 1). Housekeepers and students were more at risk of scorpion sting (46.4 and 16%, respectively) and employees were at lower risk (6.9%) ($p<0.05$). Most of cases occurred in April and October, and the fewest cases occurred in July and January ($p<0.05$) (Figure 1). Fifty-eight point nine percent (411) of cases reported from residential places, and 41.9% (287) of the cases were in non-residential areas. Thirty-two point two percent of scorpion sting cases occurred after midnight and in the early morning hours. The lowest incidence of scorpion sting occurred between 12 to 18 o'clock at the day long ($p<0.05$).Foot, hand, trunk, head, and neck were more at risk of sting by scorpions, with feet being the most likely site of stings (41.5%), while the head and neck were the least likely locations (4.6%).

Table 1. Age distribution of scorpion sting cases in Bandar Abbas during 2009-2011

Age (Year)	n	%
0-10	95	13.6
11-20	141	20.2
21-30	176	25.2
31-40	113	16.2
41-50	66	9.5
51-60	54	7.7
> 60	53	7.6
Total	698	100

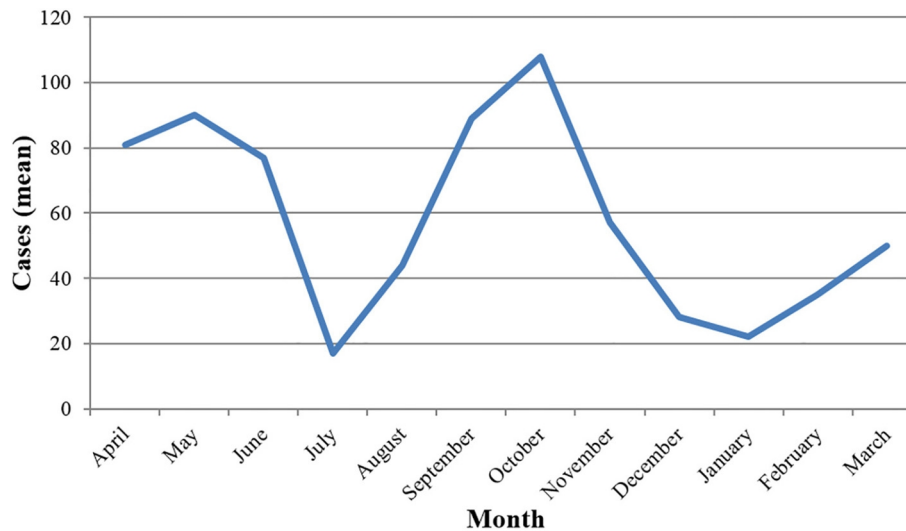


Figure1. Mean scorpion sting cases by months of the year in Bandar Abbas over 3 years, 2009-2011

4. Discussion

This study is the first cross-sectional study on epidemiologic features of scorpion stings in Hormozgan Province, and it showed that most scorpion sting cases occur in rural areas. Dehghani et al., Jahana et al., and Kassiari et al. also reported similar findings in our results (1, 2, 12). Studies in Khuzestan have shown the rate of scorpion stings in urban areas to be about 60% (13). That indicates that the rural environmental status is an important and adverse factor in increasing scorpion sting cases in Bandar Abbas city. Other studies also have shown more reported cases of scorpion stings in rural areas in comparison to urban areas. Our results didn't show any differences in occurrence of scorpion

sting between males and females. Karami et al. reported more scorpion stings in female patients who were referred to Ramhormoz Health Center than male patients, and their finding was similar to that of Vazirianzadeh et al.'s finding in Khuzestan (13, 14). Studies in Saudi Arabia have shown more incidence of scorpion sting among males. This finding could be due to their culture, job, geographic location, and social activity of men in comparison to women. Kassiri et al. in Khuzestan reported 52.6% of scorpion sting cases in men and 47.4% of cases in women (15-19). In our study the greatest rate of scorpion stings occurred among people in the age range of 21-30, but Talebian & Doroodgar reported the highest rate among children less than 10 (18). Also, Kassiri et al. reported the greatest rate among people in the 15-24 age range (19). The increased incidence of scorpion stings among young people is due to their social activity, which exposes them to greater danger of being stung. In our study, the highest incidences of scorpion stings were recorded in the spring and in the last month of summer. Our results showed two peak periods of scorpion sting, one in May and one in October. The findings of studies in several areas of Iran and in neighboring countries, such as Turkey and Saudi Arabia, indicated high incidences of scorpion stings in the summer (14, 15, 19-21). Maybe the poor correlation between our results and the results of these other studies was due to the climate in Bandar Abbas and its geographic location. Bandar Abbas is located in a subtropical area, and there is significant scorpion activity in May and October. Also, people spend more times outside their homes for rest and amusement and also increase of scorpion sting rate was because of starting the cultivation season in these months, which can lead to more exposure to scorpion sting. Most scorpion stings occurred after midnight and in the early morning hours. This result also was reported by Hoseininasab et al. and Rahmani et al. in southern Kerman and Ahwaz. Scorpion's night activity is a reasonable explanation for this result (22, 23).

5. Conclusions

This study is the first epidemiologic study about scorpion stings in Hormozgan Province. The high incidence of scorpion stings in rural areas among people in the age range of 21-30, housekeepers, and students suggests that public education programs and better sanitation services are needed in the rural areas of Bandar Abbas County. Prospective studies about ecology and distribution of various species of scorpions can help to health and medicine organization for prevention and management of scorpion sting.

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Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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