

**Research Article**

## **Epidemiological Study of Scorpion in Kohgiluyeh City during 2015-2016**

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**ABSTRACT:**

**Introduction:** Scorpion is one of the major problems in tropical and subtropical areas. So far, there have been around 1500 species of scorpion scattered throughout continents. The present study was carried out to examine the epidemiology and data analysis of scorpion scanners in order to establish a strategy to reduce scurvy and protect people.

**Materials and Methods:** This study is a cross-sectional study that was performed to determine the scorpion situation in Kohgiluyeh city during 2015-2016. Data were collected from 1524 patients selected by Scorpion in the years mentioned above and analyzed by SPSS software version 19 and Excel using descriptive statistics methods.

**Results:** The results showed that in Kohgiluyeh city from the beginning of 2015 to the end of 2016, a total of 1524 people were scorpion bites, of which 859 (56.36%) in 2015 and 645 (43.64%) in 2016, 810 (53.14%) women, and 714 (46.84%) male, the highest and lowest percentage of bites were related to age groups

**Discuss:** In the present study, the bite rate in women was higher than that of men, which is consistent with the results of a number of studies. But in some studies, bite rates in men have been reported more than the results of this study.

**Conclusion:** Also, the results of this study indicate a high prevalence of scorpion in Kohgiluyeh city. Considering the effectiveness of educational programs in reducing scorpion scourge, training programs should be prioritized.

**Key words:** scorpion, Iran, Kohgiluyeh, cross sectional.

**INTRODUCTION:**

Scorpion is one of the major problems in tropical and subtropical regions (1). The severity of the scorpion's clinical effects depends on the genus and scorpion species, the bite's season, the physiological condition of the animal, the frequency of sting and the amount of injected injections, as well as the age and health status of the selected person (2). These effects may appear from a simple localized pain response to severe systemic reactions and even death in some cases (3). The common works of scorpion do not always appear. Symptoms depend on the factors

mentioned, especially the chemical compounds present in the scorpion venom (4). Scorpion venom living in dry and warm climates is more harmful than similar specimens in cold and humid areas due to higher concentrations of poison (3.5). So far, there have been around 1,500 scorpion species that are scattered across continents, and this dispersal is more pronounced in tropical and subtropical areas (6). Real scorecard statistics are unclear. Although the world's annual statistics are estimated at one million. Mexico alone has 250,000 cases and Tunisia has 40,000 scorpions

and 100 deaths due to it. In Brazil, out of 37,000 cases of scorpion, 50 deaths have been reported (7). In Iran, more than 100,000 people per year, of whom more than 75% are children, are scorpions, of which only 36% are reported in thousands, and at least 7 to 60 deaths a year (8). However, in the United States, there are 10,000 to 13,000 scorpions reported, but only 4 deaths occur every 11 years due to scorpion scum (4.8).

The scorpion situation in different regions varies according to lifestyle, socioeconomic status, housing situation, how to provide health services and scorpion types in each geographic region (9). Due to the type of climate and climate, Iran is very rich in arthropods, especially the Scorpions (10). 44 species of scorpion have been identified and identified from 23 genera in Iran, all of which are from the two Buthidae and Scorpionidae families; about six species are medically important: *Buthotus*, *Mesobuthus*, *Hemiscorpius*, *Odonthobuthus*, *Hottentotta* and *Androctonus*. *Buthotus*, *Mesobuthus*, *Hemiscorpius*, *Odonthobuthus*, *Hottentotta* and *Androctonus* are among the most common scorpions caused by scorpion in Iran. Among them, *Hemiscorpius* is considered to be the most dangerous and deadliest scorpion in Iran. Most cases of scorpion are related to Khuzestan province. In addition to Khuzestan, scorpions from other provinces such as Hormozgan, Sistan and Baluchestan, Fars, Ilam, Bushehr, Kerman, Kohgiluyeh and Boyer-Ahmad, Kermanshah ... have been reported (11).

The southern and central parts of the country have a special place in terms of socio-economic, geographic and cultural status in relation to other parts of the country in terms of snake and scorpion bites. For example, weather conditions, people,

especially in rural areas, sleep in the summer outdoors and outdoors. Therefore, the total of these factors has caused Kohgiluyeh to be prone to scorpion bite and has a high incidence. According to the multiple reports of scorpion cases in Kohgiluyeh and the lack of coherent studies, the present study was conducted to investigate the epidemiology of scorpion scum in order to establish a strategy to reduce scum and protect people.

#### MATERIALS AND METHODS:

This study is a cross-sectional study that was performed to determine the scorpion situation in Kohgiluyeh city during 2015-2016. In order to investigate the scorpion scourge, all patients of Scorpion patients who referred to health centers and Imam Khomeini Hospital in Kohgiluyeh in Kohgiluyeh and Boyer-Ahmad Province in 2015 and 2016, were studied. In this way, information was collected about 1524 patients selected by scorpion in the years mentioned in the case file and included in the checklist prepared for this purpose, including variables such as age, sex, year of occurrence, date of scorpion, selected member. The time of bites and place of residence of patients was entered and after data coding and entering into SPSS software version 19 and excel analyzed using descriptive statistics methods.

#### Findings:

The results showed that in Kohgiluyeh city from the beginning of 1394 to the end of 1395, a total of 1524 people were scorpion bites, of which 859 (56.36%) in 2015 and 645 (43.64%) in 2016, 810 (53.14%) women and 714 (46.84%) male, the highest and lowest percentage of bites were in the age group of 34-35 years old and more than 65 years old.

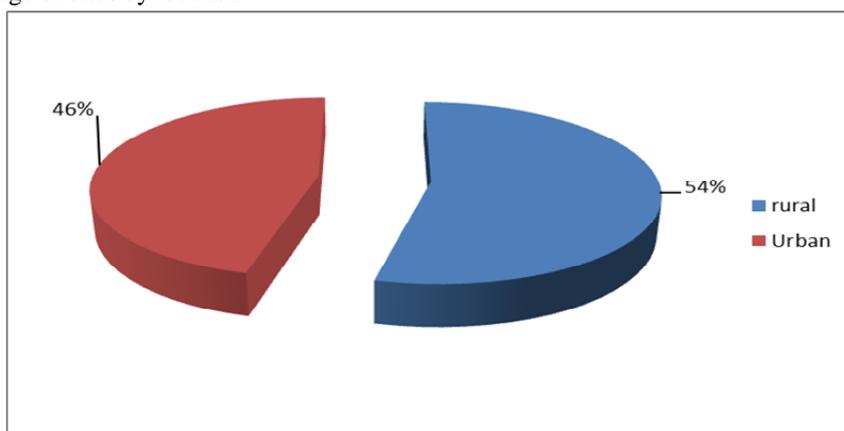
**Table 1:** Distribution of absolute and relative frequency of scorpion by age in 2015-2016

Scorpion		
age category	Abundance	Percent
0-4	80	5.24
5-9	113	7.41
10-14	129	8.46
15-24	288	18.89
25-34	347	23.76

35-44	254	16.66
45-54	144	9.44
55-64	105	6.88
More than 65	64	4.19
Total	1524	100

Among bites caused by scorpion, the highest and lowest percentages of bites were in the age groups of 25-34 years old and more than 65 years.

**Figure 1:** Percentage of bites by location



According to Schedule 1, among the patients with scorpion, more percentage of the inhabitants was in the village.

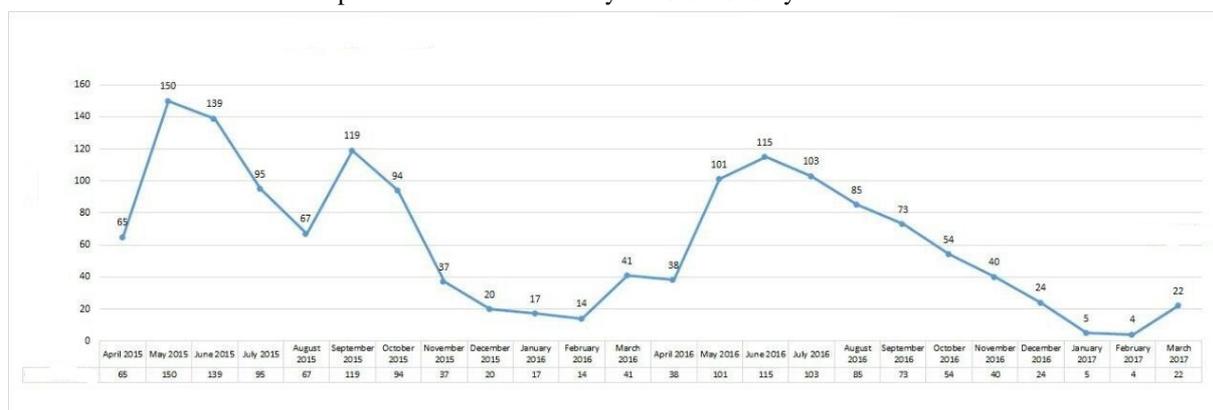
**Table 3:** Distribution of absolute and relative frequency of scorpion by location and time of biting in 2015-2016

Distribution by bite location			Frequency distribution by bite time		
Bites location	Abundance	Percent	Bite time	Abundance	Percent
Head and neck	115	7.54	12 nights till 6 am	708	46.45
Hand	437	28.67	6 am to 12 noon	363	23.81
Leg	595	39.4	12 noon to 6 evening	205	13.45
Trunk	377	24.73	6pm to 12pm	248	16.27
Total	1524	100	Total	1524	100

Of the patients with scorpion, 36 (2.336%) had history of previous stings.

**Figure 2:** Linear Schedule Scorpion Scenarios in Dehdasht County in 2015 and 2016 by month

Linear chart the number of scorpion bites in Dehdasht city in 2015-2016 by month



Also, Chart 2 shows that the highest frequency of scorpion with 608 (39.95%) was in the spring and later in summer with 542 cases (35.62%), autumn with 269 (17.67%) and the lowest bite with 103 cases (76.6%) is related to winter. The highest incidence of scorpion was observed in 245 cases (16.7%) in June and the lowest bite in 22 months (44.1%).

**DISCUSS:**

In this study, the incidence of scorpion and its effective factors in Kohgiluyeh (Kohgiluyeh and Boyer-Ahmad Province) was investigated in 2015-2016. In the current study, the average incidence of scorpion bite in 2015 was 582.77% of the population and in 2016 it was 398.3 / 100,000. In this regard, a review study conducted in 2012 showed that the prevalence of scorpion scourge in Bushehr, Hormozgan, Sistan and Baluchestan and Ilam was 127, 153.9, 13.1 and 123 per 100,000, respectively, and the average scorpion incidence in the whole country is estimated to be 59 in 100,000 people (12), which indicates that the incidence of scorpion in this study is higher than the above mentioned studies.

In some countries, such as Brazil (13) and Algeria (14), scorpion is very high, with an abundance of more than 100,000 cases a year. In this regard, it should be noted that all countries with the exception of Antarctica have somehow encountered scorpion problems and are more prevalent in tropical and subtropical areas (12). According to the results of this study, more than two thirds of patients were injected with anti-Scorpion serum that is consistent with other studies (14,15), but did not conform to Ghaderi et al. Study in Khuzestan (2004) (16).

In the present study, the scorpion incidence in rural areas was higher than in urban areas, which is consistent with the results of a study conducted in Turkey (17). However, in Pilzadeh study in Ahwaz, scorpion scores were higher in urban areas (18). In rural areas, most people are involved in farmland and outdoors, which could be related to the high incidence of scorpion (19). The number of scorpions is also higher in farmland and livestock holdings. Lying on the ground and not using the bed, putting bed and clothes on the ground, which scorpions use as shelter during the day, can be effective factors in increasing the scorpion scourge in the villages (15).

In the present study, the rate of bite in women was higher than that of men, which is consistent with the results of a number of studies (10-11).

However, in some studies, the bite rate in men has been reported more than the results of this study (20). The difference in the high-risk groups in different regions, probably related to the demographic and active forces of that area.

Children under the age of 10 years in this study account for about 15% of cases of stings, which is also reported in the study of Isa Zadehfar et al (2013) about 14%, which is consistent with the results of the present study (21). Most cases of scorpion were between the ages of 34 and 25 years, and the least of cases were bites at the age of 65 years. One of the reasons for the high prevalence of scorpion at an early age is the curiosity and risk taking behavior such as the removal of stones, the absence of scorpion on their clothes and shoes (20).

About 67% of cases of bites were organs, which were almost consistent with other studies (22-20). It is likely that the amount of bite in the limbs is due to more exposure during exercise. Most bites occurred in 2015 in May and in 2016 in June, due to the fact that scorpion activity increases in warm months (19,23). Talebian et al also point out that the rest of the people in the open air and the lack of observance of precautionary measures in summer are another factor in the increase in the scorpion incidence this season (15).

Most cases (46.4%) of scorpions occurred during the 12-night period to 6 morning. 45.93% of the patients referred to the treatment centers during the first 1.5 hours of bite, 33.3% between 1.5 to 3 hours and 19.95 hours more than 3 hours, and in other studies, there was a delayed time of referral to the treatment centers (21). As mentioned earlier, 46% of the patients referred to the emergency department during the first 1.5 hours of bite, which probably did not have adequate knowledge about the referral to the treatment centers or had no access to the treatment centers. Also, considering that all people who have scorpions do not go to emergency centers and other treatment centers, there is a low incidence of scorpion.

## CONCLUSION:

This study showed that the rate of recovery from scorpion bite in Kohgiluyeh city was 100% from 2015 to 2016, and no cases of mortality were reported. Also, the results of this study indicate a high prevalence of scorpion in Kohgiluyeh city. Considering the effectiveness of educational programs in reducing scorpion scourge, the focus of health promotion activities can be on improving home improvement education, waste collection, women's education about the dangers of scorpion bite, their familiarity with the characteristics and environment of the scorpion and safety measures before and after bite

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