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Epidemiological survey on scorpionism in Gotvand County, Southwestern Iran: an analysis of 1 067 patients

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ABSTRACT

Objective: To study epidemiologic parameters of scorpion stings in Gotvand County, Southwestern Iran, during 2006–2008. **Methods:** In this descriptive study, data were collected from health services center's files at Gotvand County. A special scorpion sting sheet was prepared. This sheet contained information about the site of scorpion sting, the date and place of the accident, the sex of the injured and etc. The frequencies of entomo–epidemiological characters were changed to the percentage basis. **Results:** Cases were collected from health services center's files over three years. There were 1 067 scorpion victims, 44.1% of whom were from rural areas. Stings occurred throughout the year, however, the highest and lowest frequency happened in August (12.5%), January (1.9%) and February (1.9%), respectively. About 41.9% of stings were on the feet and 38.8% on the hands. Stings mainly occurred in summer (35.3%) and spring (33.2%), respectively. The average of prevalence rate of scorpion sting in the county was 5.6/1 000 people. The scorpions responsible for the majority of stings were identified as 67.3% yellow, 20.2% black and 12.5% unknown colors. **Conclusions:** Scorpionism in Gotvand County of Khuzestan Province is a public health problem, which needs to be monitored carefully by the government.

1. Introduction

The scorpion stings are a common health problem in several regions of the globe; in particular in East of the Andes, Mexico, Latin America, Near and Middle–East, South India, North–Saharan Africa, Sahelian Africa and South Africa^[1]. World distribution of scorpionism is illustrated in Figure 1. Scorpions' venoms are extremely poisonous for humans. After subdermal injection in rabbit, the most serum density is attained in blood in under 2 h and about 70% of the venom of scorpion is found in the blood flow in under 15 min^[2].

More than 1 200 000 scorpion stings occur annually while the number of deaths could exceed 3 250. Average case fatality rate is 0.27%^[3]. Scorpion envenomation depends on

various factors such as, the scorpion species, scorpion size, number of stings, bulk of the venom glands, status of the venom canals of the telson, the amount of venom injected, the age of the offender, victim's age, victim's weight, interval between envenomation and hospitalization, the anatomical location of the sting, victim's health status and the season can be mentioned^[4–6].

Across Middle Eastern countries, minimum 52 species of scorpions have been distinguished in Iran^[7]. Scorpion sting cases are common in southern half of Iran, due to its climate, geographical situation and socioeconomic status^[8–10]. The southwest and south of Iran with approximately 95% species of scorpions are the most compactly populated regions in the country^[11,12]. Almost 45 000–50 000 scorpion stings are annually reported in Iran^[13].

In scorpion fauna of Iran, the being of three scorpion families comprising Hemiscorpiidae (Liochelidae), Scorpionidae and Buthidae is reported. These three families comprise 22 genera, 52 species and 25 subspecies^[14]. The families Buthidae, Hemiscorpiidae and Scorpionidae

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with 82%, 9% and 9% of all the genera and 88.5%, 5.75% and 5.75% of all the species, respectively, are the most abundant in Iran. Also, the *Androctonus* (Buthidae) and *Hemiscorpius* (Hemiscorpiidae) genera have the highest medical importance[7]. In Iran reported that scorpions liable for sting are belongs to the species, *Hemiscorpius lepturus*, *Androctonus crassicauda*, *Mesobuthus eupeus*, *Odontobuthus doriae*, *Hottentotta saulcyi*, *Hottentotta schach*, *Compsobuthus matthiesseni*, *Orthochirus scrobiculosus*, *Apistobuthus pterygocercus* and *Olivierus caucasicus*[7,14,15]. Three species of *Androctonus crassicauda*, *Mesobuthus eupeus* and *Hemiscorpius lepturus* play a major role in about all cases of scorpionisms in Iran[13].

In Iran, the greatest prevalence rate of scorpionism and its consequence death has been reported from Khuzestan Province. About 60% of all scorpion sting reports emanate from this province. Based on the published data of the Disease Management Center, frequency distribution of scorpion sting in Khuzestan Province was specified 23 984, 22 847, 23 076, 20 434 and 24 876 from 2001 to 2005, respectively[16]. In 2009, the average incidence rate of scorpion sting was determined 59.5 per 100 000 individuals in Iran, however, the highest incidence rate was apperceived in Khuzestan Province (541 per 100 000 population)[17].

In a study on 418 victims in Khuzestan Province seven scorpions *Androctonus crassicauda* (28.7%), *Hemiscorpius lepturus* (24.9%), *Mesobuthus eupeus* (21.7%), *Compsobuthus matthiesseni* (20.6%), *Hottentotta saulcyi* (3.35%), *Orthochirus scrobiculosus* (0.5%) and *Hottentotta schach* (0.25%) had the highest frequency. *Hemiscorpius lepturus* belongs to Hemiscorpiidae with hematotoxic and cytotoxic venom and the rest appertain to Buthidae with a neurotoxic venom[18]. *Hemiscorpius lepturus* (Figure 3) is one of the most perilous species of scorpion in the globe. This species is famous for possessing a strong cell-toxic venom that causes psychological difficulties, intense systemic pathology conducting to dying, profound wounds, dermal necrosis, deadly and severe hemolysis, secondary failure of the kidneys, deadly renal failure and ankylosis of the joints[15,19,20].

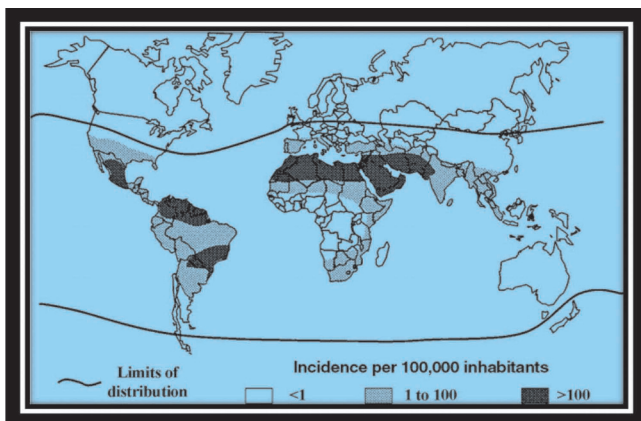


Figure 1. Scorpionism areas of the globe (prepared by J.-P. Chippaux and M. Goyffon).



Figure 2. Map of IRAN Provinces, the Khuzestan Province displayed in black color (Prepared by National Geosciences Database of IRAN).



Figure 3. A photo illustration of male and female *H. lepturus* (Prepared by MH Pipelzadeh et al).

As far as we know, no study exists to survey the situation of scorpionism in Gotvand County, Khuzestan province, Iran. This study was conducted to determine the epidemiology of scorpion stings in this region. These data are important for the control of stinging by scorpions.

2. Materials and methods

Gotvand County (32°15'05"N 48°48'58"E, altitude ca. 599 m asl) is a county in Khuzestan Province (Figure 2) in southwestern Iran. It was separated from Shushtar County in 2005. At the 2006, the county's population was 58 311, in 11 440 families.

This was a descriptive cross-sectional study of the medical records of all people diagnosed with scorpion envenomation who were admitted to Gotvand health services centers over a 3-years period extending between 2006 and 2008. The cases were monitored after their physical and history examination.

The information of 1 067 patients for the present

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