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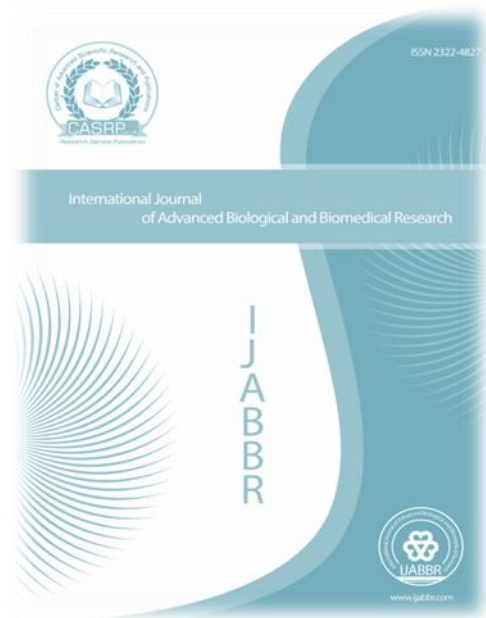
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## Prevalence of Cutaneous Leishmaniasis in the City of Sabzevar, 2013 to 2016

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### Abstract

Leishmaniasis is a protozoan zoonotic disease that is seen in Cutaneous, subcutaneous and visceral forms. The disease is transmissible via sand flies between humans and many animals, including rodents and dogs. The aim of the present study was to determine the prevalence of Cutaneous leishmaniasis in Sabzevar over four years. Information on all patients from the Sabzevar Health Center who had been treated with a diagnosis of Cutaneous leishmaniasis was investigated during the years 2013 to 2016. There were 738 patients with Cutaneous leishmaniasis between 2013 and 2016. There were 54 in 2013, of which 21 (38%) were men and 33 (61%) were women. In 2014, there were 111, 80 (72%) of whom were men and 31 (27%) of whom were women. In 2015, there were 75, 58 (61%) of whom were men and 17 (18%) of whom were women. In 2016, the number of patients increased to 543, 447 (82%) of whom were men and 96 (17%) of whom were women. Five hundred and eighty-eight (9%) of these patients were from rural areas and 195 (24%) were from urban areas. Most of the lesions (60%) were found on the hands and the lowest number (3.57%) were on the trunk. The highest numbers of infections were observed in summer and the lowest numbers were observed in winter. According to the results, the incidence of the disease increased compared to previous years, so reducing the adverse effects are necessary.

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**Keywords:** Prevalence, Leishmaniasis, Sabzevar

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## 1. Introduction

One of the major health problems in the world is Leishmaniasis, a protozoan zoonotic disease, which can be found in both urban and rural areas (Sharifi et al., 1994). Transmission of the disease is carried out via sand flies (Von Stebut and Sunderkotter, 2007). The prevalence of Leishmaniasis in Iran has risen, and the highest incidence is found in Bushehr, Khorasan, Yazd, Ilam, Fars, Isfahan and Khuzestan provinces (Javadian et al., 1976). Skin lesions are most commonly seen as papules, nodules or plaques (Shirian et al., 2014). Cutaneous leishmaniasis usually resolves after a time, but the ulcer remains and the disease may also be seen in forms of Cutaneous leishmaniasis, recurrent leishmaniasis, or mucosal skin leishmaniasis (Who, 2007). In order to properly diagnose skin leishmaniasis, in addition to clinical symptoms and epidemiological history, the use of laboratory diagnostic methods is required (Swick, 2012). About 300 million people worldwide are exposed to the disease every year (Who, 1990).

The agent of rural Cutaneous leishmania is *Leishmania major*. This is a parasite found in patients living in the indigenous centers of Iran such as Isfahan, Badroud and Ardestan (Yaghoobi-Ershadi, 1994; Jafari et al., 2007). In the rural form, the main reservoir of the disease is *Rhombomysopimus* rodents in Isfahan and the central regions of Iran; *Merioneslibycus* is a secondary reservoir (Nadim and Faghieh, 1968; Rassi et al., 2008).

Considering that Cutaneous leishmaniasis is a considerable health problem in Iran in part because of the cost of treatment and post-treatment complications, the aim of this study was to determine the prevalence of Cutaneous leishmaniasis in Sabzevar during the last four years to obtain comprehensive information on the prevalence of infection in the city.

## 2. Materials and methods

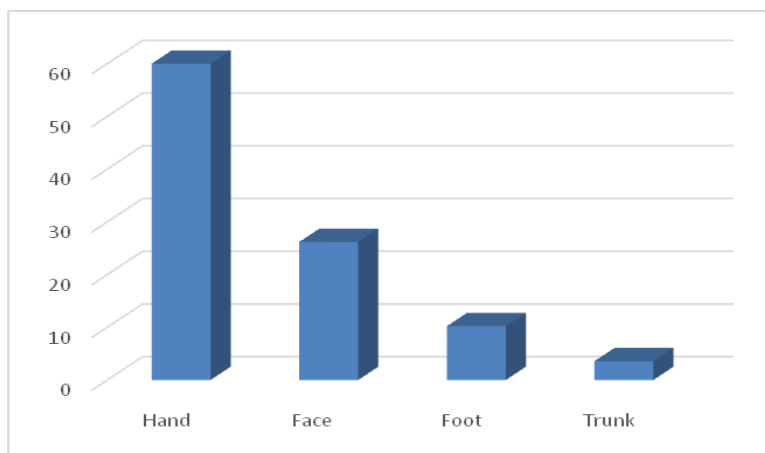
Using information provided by the Sabzevar Health Center, all patients who were diagnosed with Leishmaniasis disease between the years 2013 and 2016 were evaluated and a total of 783 cases were clinically diagnosed. Therefore, information was collected from 783 individuals from their case files, and information about the epidemiological characteristics of people with Cutaneous leishmaniasis, including sex, location and place of residence, was recorded in the questionnaire. Data were analyzed by SPSS software.

## 3. Results and discussion

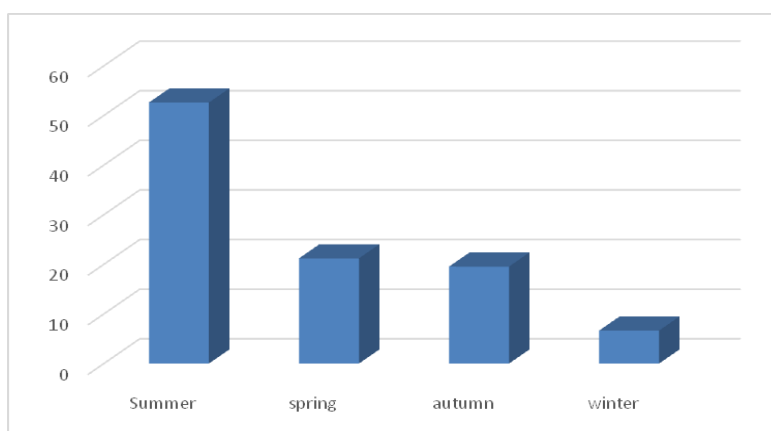
The number of people with Cutaneous leishmaniasis was 783 between 2013 and 2016. There were 54 in 2013, of which 21 (38%) were men and 33 (61%) were women. In 2014, there were 111, 80 (72%) of whom were men and 31 (27%) of whom were women. In 2015, there were 75, 58 (61%) of whom were men and 17 (18%) of whom were women. In 2016, the number of patients increased to 543, 447 (82%) of whom were men and 96 (17%) of whom were women (Table 1). Five hundred and eighty-eight (9%) of these patients were from rural areas and 195 (24%) were from urban areas. In terms of location of ulcers, 470 (60%) were on the hands, 205 (26.18%) on the face, 80 (10.2%) on the feet and 28 (3.57%) on the trunk (Fig. 1). The rate of referrals for Cutaneous leishmaniasis between 2013 to 2016 in different seasons is shown in Fig. 2: 412 (52.61%) occurred in summer, 166 (21.20) in spring, 153 (19.54%) in fall and 52 (6.64%) in winter (Fig. 2).

**Table 1**  
Incidence rate of cutaneous leishmaniasis infection based on sex during 2013-2016.

Year	Male		Female		Total
	Number	Percentages	Number	Percentages	Number
2013	54	38	33	61	21
2014	111	72	31	27	80
2015	75	61	17	18	58
2016	543	82/32	96	17/67	447



**Fig. 1.** Incidence rate of Cutaneous leishmaniasis infection based on location of involvement in Sabzevar county.



**Fig. 2.** Incidence rate of Cutaneous leishmaniasis infection based on seasons in Sabzevar county.

Leishmaniasis is prevalent worldwide, especially in tropical areas. The present study presents the epidemiological situation of Leishmaniasis in Sabzevar for the first time. The aim of the present study was to assess the incidence of Cutaneous leishmaniasis in Sabzevar from 2013-2016 related to sex, infected organ, place of residence (rural/urban) and season of the year. According to the results of this study, Cutaneous leishmaniasis has been increasing over the period from 2013 to 2016, due to reasons such as failure to observe health care, population increase and an increase in carriers. The results of this study showed that during the period of 2013 to 2016, the disease was higher in males than in females, which is similar to results found in Omidieh, Kermanshah, Damghan, Hamedan, Andimeshk and Yazd (Zahirnia et al., 2009; Hamzavi et al., 2009; Rafati et al., 2007; Behbahani et al., 2012; Nejati et al., 2012; Barati et al., 2015), which could be due to men having less clothing coverage than women and men being more active outdoors, thus having an increased likelihood of contact with an insect carrier. On the other hand, in the present study, in the year 2013, the incidence seen in women was higher than that seen in men, which is similar to that of a study in Lorestan (Dehghan et al., 2010), which could be a result of the lack of employment by men in occupations such as agriculture and resulting exposure to sand flies. In the present study, most of the lesions seen in hands were similar to those of Omidieh, Hamedan and Andimeshk (Zahirnia et al., 2009; Behbahani et al., 2012; Nejati et al., 2012) due to the lack of coverage in this area and exposure to insect carriers. But in the study conducted in Lorestan, the extent of the involvement in the foot area was greater (Babaei and Shayan, 2003). In the present study, 75.09% of the patients were resident in the village and 24.9% were residents of the city. However, in studies in Omidieh, Damghan, Hamedan and Andimeshk, residents of urban areas were affected more than rural residents (Zahirnia et al., 2009; Rafati et al., 2007; Behbahani et al., 2012; Nejati et al., 2012). One reason for the increase in cases in these cities could be an increase in migration from village to city.

The results of this study showed that the highest amount of infection was observed in summer and the lowest was observed in winter. Low levels of winter infection can be due to the decrease in the activity of sand flies in this season. The results of this study were similar to those in Chabahar (Moghateli et al., 2016). However, the highest levels of winter contamination were found in Karmanshah and Damghan (Hamzavi et al., 2009; Rafati et al., 2007), which had the highest infection in the winter and autumn, which could be due to climate change in this region compared to our study area.

#### 4. Conclusion

According to the obtained results, it was found that the incidence of this disease has increased in recent years compared to 2013, and since Sabzevar is considered as a Cutaneous leishmanial site, observing health points including the removal of stray dogs, increased rodent control, improved outdoor canals, proper disposal of sewage and construction waste, installation of fine mesh on windows and entrance doors, using ointments, and prevention of access by flying insects during rest and sleeping in infection areas, along with public education are all recommended.

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