EPIDEMOLOGY OF CUTANEOUS LEISHMANIASIS IN SABZEVAR (IRAN) FROM 2009-2013

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ABSTRACT

Background and purpose: Cutaneous leishmaniasis (also known as oriental sore, tropical sore, chiclero ulcer, chiclero's ulcer or Aleppo boil) is still one of the most important health issues in many parts of Iran. The present research was conducted to study the epidemiological characteristics of cutaneous leishmaniasis in Sabzevar in the last five years.

Materials and method: In the present research, all the registered cases of cutaneous leishmaniasis from 2009-2013 were studied, and the researcher considered the patients' information including age, sex, number and locations of lesions registered in their medical records. The data collected was input into SPSS version 16, and it was then analyzed descriptive statistical methods and chi-square test.

Findings: From as many as 2158 patients registered, 1227 patients (56.9%) were male, and 931 patients (43.1%) were female. As many as 346 patients (16%) lived in the city, and 1812 (84%) were rural residents. The most frequent age group suffering from cutaneous leishmaniasis was 20-40 years (33.4%). Ulcer frequency on the body surface is as follows: one ulcer: 41.8%, two ulcers: 22.9%, and three and more ulcers: 35.3%. With respect to the infected organ, the percentage of the prevalence of the disease is as follows: 11.3% on face, 35.8% on hands, 22.2% on feet, and 30.7% on various organs at the same time. The prevalence distribution of the disease in the studied years is as follows: 2009: 220 cases, 2010: 318 cases, 2011: 631 cases, 2012: 507 cases, and 2013: 482 cases.

Conclusion: Given the findings obtained, it can be concluded that Sabzevar is one of the important areas of cutaneous leishmaniasis endemic, and this calls for continuous care of the disease to put the disease under control.

Keywords: epidemiology, cutaneous leishmaniasis, Sabzevar

Introduction

Leishmaniasis is the name for a group of protozoan diseases that is transmitted from sand flies from Phlebotominae subfamily. Clinically speaking, it is divided into some forms including: cutaneous (cutaneous leishmaniasis), Mucosal (kala-azar), and Mucocutaneous [1]. Clinically speaking, cutaneous leishmaniasis is observed into two forms in Iran: rural (wet ulcer) and urban (dry ulcer). Rural cutaneous leishmaniasis is a joint disease in humans and animals and is known as Zoonotic Cutaneous Leishmaniasis (ZCL). Cutaneous leishmaniasis is known as humanitarian and is called anthroponotic cutaneous leishmaniasis. The cause of rural cutaneous leishmaniasis is leishmania major and the cause of urban cutaneous leishmaniasis is leishmania tropica [2]. In the urban cutaneous leishmaniasis or dry, the source of the disease is human, but dogs accidentally suffer from this disease as well. As for the rural cutaneous leishmaniasis or wet, the source of the disease is mainly rodents. The factors facilitating the
and the least frequent age group suffering the disease was 7-12 years (7.6%) (Table 1).

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then input into SPSS and underwent statistical analysis.

Method
In the present retrospective descriptive-analytic study, the statistical population includes all the individuals that were diagnosed with cutaneous leishmaniasis in health centers of Sabzevar, and after clinical and laboratory confirmations, they underwent treatment and follow-up, and the information related to them was registered by the personnel of the above-mentioned centers in the epidemiologic summary forms of cutaneous leishmaniasis. Thus, the information related to 2158 patients suffering from cutaneous leishmaniasis was extracted. The information needed for each patient (including patients’ visiting time, age, sex, place of residence, number of lesions, and the location of lesion) was input in the related checklists. The data obtained was then input into SPSS and underwent statistical analysis.

Findings
During 5 years, the number of cutaneous leishmaniasis cases has been reported to be 2158 cases in Sabzevar. Diagram 1 shows the incidence rate of cutaneous leishmaniasis in Sabzevar based on the years studied. The highest rate of incidence is for 2011 with 135.2 in 100 thousand (given the whole area’s population of 466740 according to the census of 2011) (diagram 1).

From as many as 2158 patients registered, 1227 patients (56.9%) were male, and 931 patients (43.1%) were female. As many as 346 patients (16%) lived in the city, and 1812 (84%) were rural residents.

The patients’ mean age was 31.08 with the standard deviation of 20.64. The most frequent age group was 20-40 years (33.4%), and the least frequent age group suffering the disease was 7-12 years (7.6%) (Table 1).

In studying the patients, based on the anatomical location of the lesion, the percentage of the prevalence of the disease is as follows: 11.3% on face, 35.8% on hands, 22.2% on feet, and 30.7% on various organs at the same time. The patients had a mean ulcer of 2.82 cutaneous leishmaniasis ulcers with the standard deviation of 2.93. Ulcer frequency on the body surface is as follows: one ulcer: 41.8%, two ulcers: 22.9%, and three and more ulcers: 35.3%. From the patients studied, 70 percent (1508 cases) of the individuals had a wet ulcers, and 30 percent (650 cases) had dry ulcers.
In our 5-year study, the highest prevalence rate of the disease is related to Joveyn (200 cases in 10 thousand), and the lowest prevalence rate of the disease is related to Sheshtamad (1.5 cases in 10 thousand) (diagram 2). The patients’ jobs indicate that students were the most frequently suffered group. On the other hand, military jobs were the least frequently suffered group (diagram 3).

**Diagram 1.** The incidence rate of cutaneous leishmaniasis based on the suffering year in Sabzevar (in 100 thousand people)

**Diagram 2.** The incidence rate of cutaneous leishmaniasis based on the geographical location in Sabzevar (in 100 thousand people)

**Table 1.** The frequency of cutaneous leishmaniasis cases based on sex, place of residence, and age group in Sabzevar from 2009-2013

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joveyn</td>
<td>200</td>
<td>50</td>
</tr>
<tr>
<td>Joghatai</td>
<td>50</td>
<td>12.5</td>
</tr>
<tr>
<td>Khoshab</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>Sabzevar</td>
<td>100</td>
<td>25</td>
</tr>
<tr>
<td>Sheshtamad</td>
<td>1.5</td>
<td>0.375</td>
</tr>
</tbody>
</table>
Table 1. The prevalence percentage of cutaneous leishmaniasis cases based on jobs in Sabzevar, 2009-2013

*By other jobs, we mean jobs such as hunter, drivers, office workers, construction workers, and the unemployed.

**Discussion**

The findings of the present study indicate that the incidence rate of this disease in Sabzevar is 462.35 in 100 thousand people (2009-2013). However, the incidence rate of this disease has been reported to be 2.05 in 100 thousand people (2002-2007), and it was reported as 65.8 in 100 thousand people in Andimeshk (2005-2010) [6, 7].

In the present study, the statistical test indicated a significant statistical difference with respect to the affected patients’ location of lesion and their sex (p=0.006). Since 56.9 percent of the patients were male, this statistical difference is likely owing to men’s working outdoors, their less clothing coverage than that of women, and working on farms. Thus, they are more exposed to Phlebotomus bites. However, the statistical test did not indicate any significant difference with respect to the number of lesions and sex (p=0.36). Similar studies conducted by Deloei et al, Zahirnia et al, Saghaipoor et al, Nilforoushzadeh et al, Pagheh et al, and Rafati et al indicate that men tend to suffer more frequently from this disease [6, 8, 10, 12, 13, 19].

Unlike the findings of our studies, the studies conducted by Doroudgar et al and Hanafi Bajd et al indicate that both males and females were sensitive to the disease. The females’ higher suffering rate is likely owing to women’s economic activities and carpet weaving in rooms with poor light and basements where Phlebotomus is active during the day and continues to suck human blood [9-18].

The statistical test indicated a significant statistical difference with respect to the affected patients’ number of lesions and their age (p=0.004).

The age distribution of the patients in the present study indicate that a considerable percentage (33.4%) of the patients are 20-40 years old. This age group includes both young people and adults. However, this significant difference is justifiable: young people constitute the main labor force, and it is likely that they have immigrated to the endemic areas to find a job, and they are then at risk of infection from this disease. The findings of the study conducted by Nejati et al also indicate that the age distribution of the disease is mainly for young individuals than other age groups. Moreover, in the study conducted by Saghaipoor et al, a remarkable percentage of the patients (74.5%) are active and working young individuals and adults [7-10].

Unlike our findings in the present study, in the studies conducted by Pagheh et al, Ahmadi et al, and Babaei et al, a remarkable percentage of the patients were under 10 years old. This is likely owing to their mobility, their behavioral characteristics outdoors, and their clothing style that make them exposed to Phlebotomus bites [13, 14, 20].
According to our findings, the highest percentage of the ulcers (35.8%) were in the patients’ hands that are mainly without any covering. However, the percentage of the ulcers in face, feet, and the simultaneous ulcers were 11.3%, 22.2%, and 30.7 respectively. The oral appendages of Phlebotomus is low, and it prevents them from sucking blood from areas covered. It is more likely that it bites areas without any covering.

In the study conducted by Rowghani et al, the highest percentage of the ulcers was for the patients’ hands (463 cases). With respect to the areas injured, face was the second most injured area. In the study conducted by Nejati et al, the highest percentage of the ulcers was for the patients’ hands (35.8%) followed by ulcers in feet (25.4%). In the study conducted by Rafati et al, the highest percentage of ulcers was for hands (55%) followed by feet (43%). The findings of other studies conducted in Damghan, Mirjaveh, and Saudi Arabi indicate that most of the ulcers were observed in areas without any covering [6, 7, 11, 19].

Our findings indicate that most of the patients (41.8%) had one ulcer. A similar study conducted in Andimeshik indicates that 40.2% of the patients had one ulcer, 35.8% had 2-3 ulcers, and 24% had more than one ulcer. The study conducted by Zahirnia et al indicate that 39% of the patients had one ulcer. The findings of their study conform to those of the present study. In their study, Doroudgar et al have reported similar findings: 61.4% of the patients had only one ulcer. In the study conducted by Mohammadi Azi et al, most of the patients (54%) had one ulcer. Contrary to the findings of our study, the findings of the studies conducted by Hashyani et al and Sharifi et al indicate that most of the patients had two and more than two ulcers. This is owing to the frequent bites of Phlebotomus [6, 7, 9, 16, 17, 21].

Since the prevalence of this disease has increased in the last decade owing to the environmental factors such as frequent immigrations, recent developments in agriculture, population changes, and construction and water supply projects, and thus the high incidence of this disease is justifiable in Khorasan province [8].

Conclusion
According to the findings of the present study, the average incidence of cutaneous leishmaniasis is 462.35 in 100 thousand people. This indicates that the high prevalence of cutaneous leishmaniasis is to be considered as a significant health problem in Sabzevar. Thus, this disease calls for taking national measures to fight and control this disease. Although the ulcers heal even without conducting any treatments, losing time, workforce, and treatment costs are significant, and the scars resulted are likely to bring about mental problems. Thus, for preventing the complications of cutaneous leishmaniasis, the officials in charge need to give due attention and priority toward controlling this disease. From among the preventive measures that can be taken toward controlling this disease, we can refer to using mosquito nets dipped in poison, giving necessary education for people. This indicates that the high prevalence of cutaneous leishmaniasis is to be considered as a significant health problem in Sabzevar. Thus, this disease calls for taking national measures to fight and control this disease. Although the ulcers heal even without conducting any treatments, losing time, workforce, and treatment costs are significant, and the scars resulted are likely to bring about mental problems. Thus, for preventing the complications of cutaneous leishmaniasis, the officials in charge need to give due attention and priority toward controlling this disease. From among the preventive measures that can be taken toward controlling this disease, we can refer to using mosquito nets dipped in poison, giving necessary education for using clothes covering the entire body, and taking health measures such as collecting garbage and construction waste.

Appreciation
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