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Prevalence and epidemiologic profile of acute cutaneous leishmaniasis in an endemic focus, Southwestern Iran

Mohammad-Hossein Feiz-Haddad[1], Hamid Kassiri[2*], Niusha Kasiri[1], Assiae Panahandeh[2], Masoud Lotfi[2]

[1]*Faculty of Medicine, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

[2]*Faculty of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

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ABSTRACT

Objective: To evaluate the cutaneous leishmaniasis prevalence in Shadegan County, Iran, during 2007–2009.

Methods: This is a descriptive research which concentrates on the 100 patients who we referred to the Shadegan Health Center. The disease was diagnosed based on clinical exam and microscopic observation of the parasites in the lesion site. The patients' data were recorded. The statistics have examined the various epidemiological aspects of the disease by considering descriptive indices such as gender, age, occupation, month and seasonal distribution, number and site of the lesions. Information analysis was performed using SPSS software.

Results: Overall, 100 cases consisting of 32 females (32%) and 68 males (68%) were examined for the presence of active ulcers. Most of the infection was in age group 11–20 years (31%) and the lowest in 31–40 years group (7%). Most of the active ulcers were on the feet (42%). The majority (47%) had one lesion. Most of the cases (42%) had occurred during 2007. All cases were observed in the rural areas.

Conclusions: This study showed that the male sex and people under 20 years of age are mostly at risk. Therefore, education for groups at risk is very important.

1. Introduction

Cutaneous leishmaniasis (CL), a zoonotic disease, is still a public health problem in many parts of the world, especially in tropical and sub-tropical countries. The CL exists in 88 countries with 1.5 million new cases per year[1,2]. World Health Organization has, in fact, announced leishmaniasis as the sixth most significant disease in tropical and subtropical areas[3]. Almost all the CL cases (90%) occur in only seven countries, *i.e.* Iran, Afghanistan, Algeria, Brazil, Peru, Syria, and Saudi Arabia[4].

Two epidemiological forms of the CL are present in Iran: anthroponotic CL (ACL) and zoonotic CL (ZCL). The ACL is urban type that caused by *Leishmania tropica* and main vector and reservoir of the disease are *Phlebotomus sergenti* and human, accordingly. The ACL can be seen more in Tehran, Shiraz, Kerman, Bam, Mashhad, Sabzevar and Neishabour cities[5–8]. The ZCL is rural type and it is caused by *Leishmania major* (*L. major*). The vector and reservoir are *Phlebotomus papatasi* and rats, correspondingly. The ZCL is mainly seen in the areas of some cities such as, Esfahan, Sarakhs, Lotfabad, Kashmar, Kashan, Khuzestan and Ilam and Golestan Provinces. In recent years, factors such as new settlement, environmental changes, war, uncontrolled urbanization, converting agricultural lands to residential form caused more contacts between humans and vectors of the leishmaniasis resulted in significant increase[9–15]. Approximately, 20000 cases of the disease are annually reported from different parts of Iran. However, it is assumed that the actual amount has been expected to be five times higher[16,17]. The CL caused by

*Corresponding author: Hamid Kassiri, PhD, Department of Medical Entomology and Vector Control, Faculty of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
Tel: +98 6113738269
Fax: +98 6113738282
E-mail: Hamid.kassiri@yahoo.com

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L. major is still an abundant and increasing public health issue in many rural regions of 15 out of 30 provinces of Iran[18]. The *L. major* is main species of CL in Khuzestan Province[19–21]. Since the epidemiological characteristics of CL in Shadegan County have yet to be scrutinized in recent years, basic information is needed to determine future control measures for organizing a proper program in order to fight against the disease more fruitfully.

2. Materials and methods

Shadegan is a county in Khuzestan Province, Southwestern Iran. The county is bordered with Abadan, Khorramshahr, Ahwaz and Mahshahr countties and led to south of the Persian Gulf. The capital of the county is Shadegan with population of 138 226, in 23 813 families at an area of 3 600 km^2. Shadegan and Khanafereh are two main districts of the county. The majority of the county's residents are ethnic Arab and speaking Arabic language. Shadegan is located in bordering with Iraq country and located in a low landing area, with geographical coordinates of 30°40′ N, 48°40′ E and positioned in the highest point, 10 m above sea level. The climate is classified as very warm region[22].

A descriptive cross-sectional study was designed to evaluate individuals with CL lesions (n = 100) who referred to the Health Centers in Shadegan County during 2007–2009. The contributors were being examined by general practitioners in the Health Centers. Informed consents were provided and a special questionnaire was completed with specific epidemiologic characteristic agents including gender, age, occupation, lesion site, lesion number and seasonal occurrence.

The most indurate margin lesions were carefully chosen and cleaned from debris with normal saline to provide appropriate smears on the slides. Necrotic and purulent lesions were treated with precise care and debris was removed before sampling. Skin scratching from the lesion was obtained and smears were prepared on a slide, following fixation in methanol for 20–30 s. The samples were then stained with Giemsa for 20–30 min and examined microscopically for presence of amastigotes agents. At least, two Giemsa-stained slides were prepared for each patient for microscopic examination. The *Leishmania* amastigotes were detected under the microscope, the CL was confirmed and the patient's completed questionnaire was evaluated. Finally, the obtained data were analyzed by means of descriptive statistics.

3. Results

Leishmania amastigotes were identified by microscopic examination in 100 patients during 2007–2009 in Shadegan County. The mean prevalence rate of the disease in the study area was calculated as 0.3 (Table 1). The disease was found to infect both gender and all the age groups (Tables 2 and 3). However, association of CL infection and gender was observed in 68% (n = 68) males and 32% (n = 32) females. Although the maximum rate (31%) of infection was recorded in 11–20 years age group, the lowest rate (7%) was signified by the 31–40 years age group. Overall, more than 50% of samples with *Leishmania* lesions were noted to be for the individuals older than 10 and younger than 30 years old who were the most active group of the population due to their behavior, occupation and education.

Frequency of CL based on the lesion number varied with single lesion that was observed in the majority of patients (47%). In addition, double lesions were seen in 22% of cases, 6% of patients presented with 3 and 25% with 4 or more than 4 lesions (Table 4).

The patients' residential location and occupation are important aspects for defining environment where the infections might have taken place. The utmost common frequencies of infections were noted to be in patients who were living in Khanafereh and Jefal sub-counties with 36% and 30%, respectively. The lowest percentages were described in patients from Bozibe and Hosseini sub-counties with 6% and 7%, followed by Abshar and Darkhovein with 8% and 13%, individually (Table 5). Table 6 shows the distribution of CL among patients based on occupations in Shadegan County, during 2007–2009. As the statistics

Table 1
Changes of the cutaneous leishmaniasis cases and prevalence rates in Shadegan County, Khuzestan Province, Southwestern Iran.

Years	Frequency No. (%)	Prevalence/1 000
2007	42 (42.0)	0.3
2008	20 (20.0)	0.4
2009	38 (38.0)	0.2
Total	10 (100.0)	0.3

Table 2
Frequency distribution of cutaneous leishmaniasis according to gender in Shadegan County, Khuzestan Province, Southwestern Iran.

Years	Female No. (%)	Male No. (%)	Total No. (%)
2007	17 (40.5)	25 (59.5)	42 (100)
2008	5 (25.0)	15 (75.0)	20 (100)
2009	10 (26.3)	28 (73.7)	38 (100)
Total	32 (32.0)	68 (68.0)	100 (100)

Table 3
Frequency distribution of cutaneous leishmaniasis according to age group in Shadegan County, Khuzestan Province, Southwestern Iran.

Age groups	2007 No. (%)	2008 No. (%)	2009 No. (%)	Total No. (%)
0–10 years	13 (30.9)	6 (30.0)	9 (23.7)	28 (28.0)
11–20 years	15 (35.8)	7 (35.0)	9 (23.7)	31 (31.0)
21–30 years	9 (21.4)	4 (20.0)	12 (31.5)	25 (25.0)
31–40 years	0 (0.0)	1 (5.0)	6 (15.8)	7 (7.0)
> 40 years	5 (11.9)	2 (10.0)	2 (5.3)	9 (9.0)
Total	42 (100.0)	20 (100.0)	38 (100.0)	100 (100.0)

Table 4
Frequency distribution of cutaneous leishmaniasis cases according to the number of lesions on the body in Shadegan County, Khuzestan Province, Southwestern Iran.

Lesion frequency	2007 No. (%)	2008 No. (%)	2009 No. (%)	Total No. (%)
1	18 (42.8)	10 (50.0)	19 (50.0)	47 (47.0)
2	8 (19.1)	3 (15.0)	11 (28.9)	22 (22.0)
3	2 (4.7)	3 (15.0)	1 (2.7)	6 (6.0)
4	14 (33.4)	4 (20.0)	7 (18.4)	25 (25.0)
Total	42 (100.0)	20 (100.0)	38 (100.0)	100 (100.0)