An Epidemiological Study of Cutaneous Leishmaniasis in Poledokhtar District, Lorestan Province, Southwestern of Iran, 2001-2011

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Abstract

Introduction: Leishmaniasis is one of the six important tropical diseases, different aspects of which required to be studied, as recommended by World Health Organization. Cutaneous leishmaniasis is a prevalent parasitological disease with diverse clinical manifestations in Iran. This study investigated the status of cutaneous leishmaniasis in Poledokhtar district, during 2001-2011.

Methods and Materials: This descriptive survey was performed on all 310 cutaneous leishmaniasis patients recorded in the Poledokhtar health center during 2001-2011. Demographic information of patients including age, sex, habitat, number and sites of lesion,month and years of incidence were recorded.The data were described by SPSS16 software.

Results: Out of 310 under care patients, 142 cases (45.81%) were males and the rest of patients (54.19%) were females. Totally 41 patients (13.23%) resided in urban areas, while 269 (86.77%) lived in rural areas. The most frequent age group was 20-29 years old (25.16%). Hands were the most common sites of lesions (44.84%). Out of 9.03% of the patients had two or more lesions (56.45%).The most frequent cases of the disease were observed in the fall.

Conclusions: The incidence rate of cutaneous leishmaniasis in the years has been higher than expected rate in Poledokhtar district. This situation has been alarming and comprehensive planning for control and prevention of the disease is necessary.

KeyWords: Epidemiology, Cutaneous leishmaniasis, Poledokhtar, Lorestan.

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Introduction

Cutaneous leishmaniasis (CL) is one of the most important Zoonotic diseases, which is caused by several species of *Leishmania*as protozoan parasites (1). Annually, about 1 to 1.5 million new cases of CL are reported, worldwide, which 90% of them belong to Iran, Iraq, Afghanistan, Saudi Arabia, Algeria, Brazil and Peru (2, 3, 4, 5). Cutaneous leishmaniasis in Iran are seen in two forms: dry (urban) and wet (rural). In the rural form, which is caused by *L.major*, rodents are considered as reservoirs, and the main vector of the disease is*Phlebotomuspapatasi* sand fly, but in the urban form,which is caused by *L.tropica*, the main reservoirs of disease is of human and dog, and the major vector is *Ph.sergenti*sand fly (6, 7, 8, 9).Annually, about 20 thousand cases of cutaneous leishmaniasis are reported from different parts of Iran, which its actual amount is several times more than the amount reported (7, 10).The disease is endemic in 15 provinces; and in recent years, due to favorable climatic and ecologic conditions for vectors and reservoirs the disease, it has created the active foci in some areas (11). Epidemiological characteristics of the disease are different in various foci, as studies in Damghan, Yazd and Kashan confirm this fact (2, 12, 13). Chegeni et al (14) have implied the increasing rate of CL in Lorestan province in the recent years with emphasizing on the epidemic of 2006 which defined Poledokhtar with 178 cases out of 300 CL patients, as the most CL infected area in the province.Poledokhtar district with 3,615 squared kilometers and a population of approximately 81,096 people is one of the counties of Lorestan Province, which is located in the south of the province; it is situated in the North and East of Khorramabad district, in the eastern south of Andimeshk district in Khuzestan province; in the west ends in the Kouhdasht district, and in the eastern south ends in Dareshahr in Ilam Province. The district has a semi-temperate climate so warm and arid (unpublished data of Poledokhtar health center). The basic data of CL and effective factors are essential measures to make a plan regards restricting the disease in the area of Poledokhtar. Therefore the present retrospective study was carried out to describe the epidemiologic conditions of CL in Poledokhtar.

Methods and materials

In the current descriptive study, the population included all patients who were under therapy and follow-up from April 2001 until March 2011 with diagnosis in CL the health center of Poledokhtar district and clinical and laboratory approval, and information about them were recorded by the staff of the center in the form of summary information on the epidemiology. So, data pertaining to the 310 patients was extracted from their records. The required demographic about each patient including age, sex, place of residence (urban or rural), and history of disease, number, type and site of lesions were compiled in a checklist. Obtained data were described by SPSS v. 16 as percentages.

Results

One hundred and forty two out of 310 patients with cutaneous leishmaniasis (45.81%) were males, the rest of 168 were females (54.19%). Also, 41 (13.23%) of the patients lived in urban areas and the rest of 269 (86.77%) patients in rural areas. In this study, the age group of 20 to 29 years with 25.16% of cases was recognized as the most infected age group with CL (Table 1).In the present study the most and the least frequencies of CL were recorded as 178 (57.42%) and two (0.65%) in the years of 2006 and 2002, respectively. In this study, the maximum numbers of CL lesions were reported in October with the rate of 67 (21.61%), however the minimum numbers were in June and July with the rates of 2 (0.65%). In this study, 50.97% of patients were with one lesion and 49.03% of patients had more than one lesion on their bodies. A total of 39 patients

(12.58%) of 310 patients with CL, had dry lesions, and 271 patients (87.42%) had moist lesions. Hands had the highest rates of CL lesions (44.84%) followed by legs (21.29%) and faces (18.71%).

Table 1: Prevalence of cutaneous leishmaniasis by age group in Poledokhtar district in 2001-2011

Age group (years)	Number of case	%
0-9	57	18.39
10-19	70	22.58
20-29	78	25.16
30-39	39	12.58
40-49	28	9.03
50-59	22	7.10
60-69	9	2.90
70-79	5	1.61
≥80	2	0.65
Total	310	100

Table 2: Number and location of lesions in patients in Poledokhtar district in 2001-2011

		Number of case	%
Number of lesions	1	158	50.97
	2	80	25.81
	3	40	12.90
	4	13	4.19
	5	6	1.94
	6	3	0.97
	7	2	0.64
	>7	8	2.58
	Total	310	100
Location of lesions	Hand	139	44.84
	Foot	66	21.29
	Face	58	18.71
	Hand & Foot	19	6.13
	Hand & Face	19	6.13
	Hand & Foot & Face	3	0.97
	Body	2	0.64
	Other	4	1.29
	Total	310	100

Figure. 1: Trend of Number of cutaneous leishmaniasis patients by year of disease occurrence in Poledokhtar district in 2001-2011

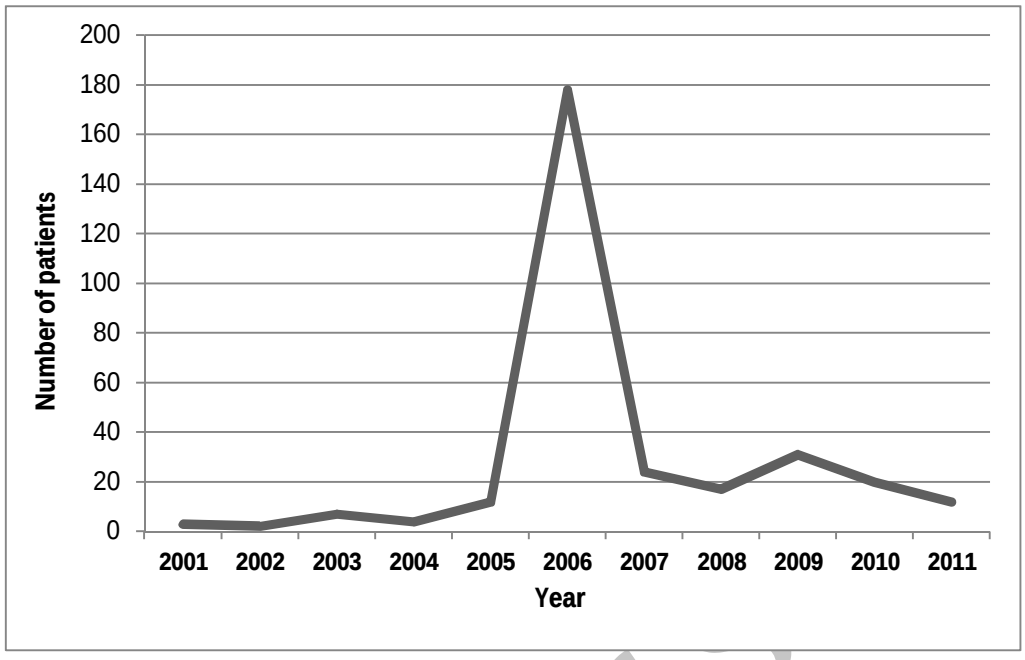
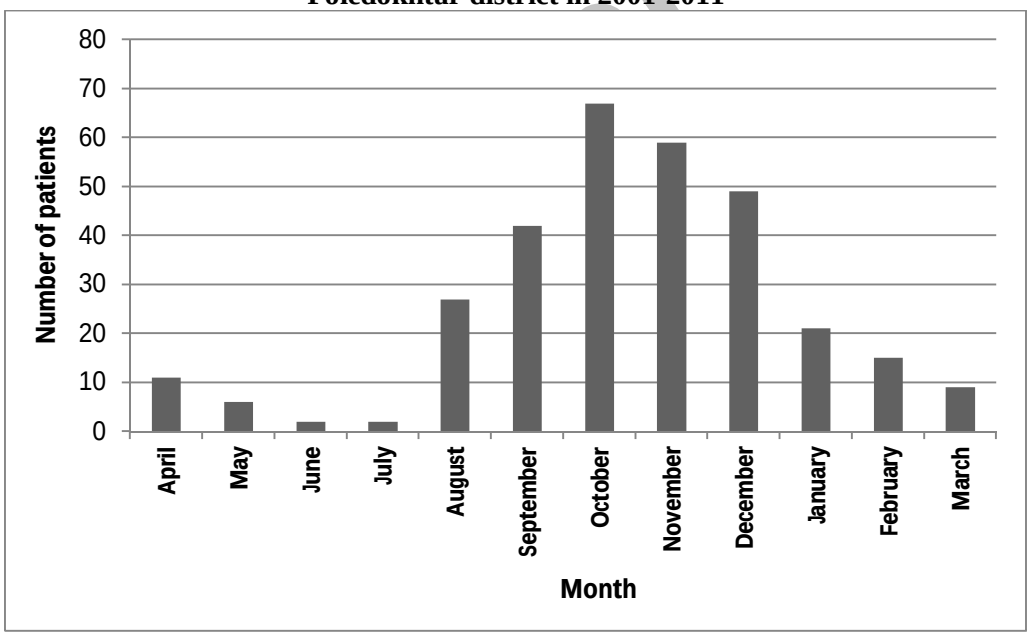


Figure. 2: Number of cutaneous leishmaniasis patients by month of occurrence disease in Poledokhtar district in 2001-2011



Discussion

Characterizing the demographic information of CL patients would be valuable in better understanding the epidemiology and ecology of leishmaniasis. These factors provide basic epidemiological information to make vector and reservoir control programs to reduce the incidence of CL in the region (15, 16).The results of this study indicate that reported CL among women were greater than men. These results are consistent with the results of studies in GonbadKavoos (17), Bam (18) and Larestan (19). This fact is due to women's work in livestock breeding and subsequently the increased likelihood of bites by the Sand fly vectors of disease.But

they are inconsistent with the results of studies in Hamedan (20), Kashan (21), Damghan (2), Gorgan (22) and Kermanshah (16).

In the current research, frequencies of CL in rural areas were greater than urban areas. These results are consistent with the results of studies in Kashan (21), Damghan (2) and Larestan (19), but they are inconsistent with studies in Hamedan (20) and Gorgan (22).Abundant cases in the rural areas are assumed to be due to the availability of the favorable condition of vectors and reservoirs in rural area and accordingly the increased likelihood of human contact with infected sand flies. It is noteworthy that no study has been performed about vectors and reservoirs of cutaneous leishmaniasis in Poledokhtar district and other regions of Lorestan Province yet.

The results of this study indicate that most cases of CL happened within the age group of 20-29 years, which it is consistent with the studies in Damghan (2), Gorgan (22) and Kermanshah (16); but in some studies (17, 19, 20, 21) other age groups had the highest incidence. It is assumed that this age group is active in agriculture and livestock activities more than other groups, therefore, disease in this group is more common than the other groups. In this study, the highest incidence of CL occurred in autumn (56.45%), which they are consistent with the results of studies in Damghan (2), Gorgan (22), Kermanshah (16) and Bushehr (23), but against to the study in Bam (18) where urban CL is prevalent. In urban CL, frequency of cases is constant during a year, and little seasonal variations are seen, and this is one of the epidemiological features of this type of CL (24); but in the rural foci of CL, most cases are in the autumn and winter of a year (23).This is accordance to the results of this study, which indicate that about 71% of the cases of CL in Poledokhtar district have been reported in the second half of a year, that is fall and winter seasons, and this indicates being the dominant rural type of the disease in this area. The results of this study show that more than half of the patients had just one lesion, and the rest of the patients had two or more than two CL lesions. This is very similar to the other studies which have been carried out in Kashan (21), Damghan (2), Kermanshah (16), Bam (18) and Larestan (19). In some surveys (17, 22), lesions of patients with CL were mainly over one.

The obtained results of this study regarding the infected organs indicate that the majority of sand fly bites happened in the hands and this is similar to the other related studies in Iran. However, it is not consistent to the studies of Gonbadkavoos and Bam in Iran, which the feet and faces were recorded as the most infected organs, respectively (17, 18). It should be noted that one of the characteristics of rural type of CL is that often the lesions are in the hands and feet (7). And the results obtained from this study also showed that most of lesions (72%) were in the hands and feet, and for this respect, the disease pattern is very similar to patients in the endemic regions of rural type of CL. Several studies (25, 26, 27, 28, 29) indicate being dominant rural CL in the provinces of Khuzestan and Ilam that are bordered with Poledokhtardistrict, and they have a social and economic relationship with it. Also, in an article that has recently been published (30), Lorestanprovince is one of the provinces that CL is prevalent in it. Given that being the dominant rural type of CL in Lorestan Province and accordingly in Poledokhtardistrict, the program for fighting with CL in these areas should be implemented according to the type of CL.With an examination of the trends of cases in Poledokhtardistrict, it is seen that cases reported have been scattered and sporadically with the mild fluctuations until the year 2006; however, in 2006, cases of the disease had a dramatically sudden increase, and has reached 178 cases

in this year; while the incidence rate in the five-year period prior to that did not exceed the 12 cases a year. It seems that the issue has been neglected until the year 2006; for that reason, and due to the Nevertheless, since the outbreak in 2006, cases of the disease have been greatly diminished after implementing the program for spraying insecticide with Deltamethrin and Lambdacyhalothrin in the residential and non-residential places in some villages in the years of 2007 as well as via the distribution of mosquito nets impregnated with the insecticide and insects repellent in the infected areas of the district and also face to face education and distribution of the booklet and pamphlet at health centers, offices and schools.

Conclusions

Regarding the results of this study, it is assumed that the CL in Poledokhtar is an endemic rural type of leishmaniasis. Therefore, the appropriate preventing measures regarding to the rural CL should be considered to decrease incidence of the disease in the region to reduce the occurrence of a new outbreak of the disease in the region.

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References

1-Mohammadi Azni S, Rassi Y, Oshaghi MA, Yaghoobi Ershadi MR, Mohebali M, Abai MR, et al. [Determination of parasite species of cutaneous leishmaniasis using Nested PCR in Damghan-Iran, during 2008]. J conditions for transfer of disease in this region, there was the outbreak of cutaneous leishmaniasis in Poledokhtardistrict. Of course, climate change can also be effective in this matter. GorganUniv Med Sci 2011; 13(1):59-65. [In Persian]

2-Mohammadi Azni S, Nokandeh Z, Khorsandi A, Sanei Dehkordi AR. [Epidemiology of cutaneous leishmaniasis in Damghan district]. J Military Med 2010; 12(3): 131-5. [In Persian]

3-World Health Organization. The leishmaniasis. Geneva: WHO Tech Rep; 1999. Ser. No. 7011984.

4-World Health Organization. Epidemiological aspects control of the leishmaniasis. Geneva: WHO Tech Rep; 2000. Ser. No. 793.

5-Desjeux P. Disease watch focus: Leishmaniasis. Nature Rev Microbiol 2004; 2: 692-3.

6-Mohammadi Azni S, Rassi Y, Oshaghi MA, Yaghoobi Ershadi MR, Mohebali M, Abai MR, et al. [Determination of parasite species in staining slides of cutaneous leishmaniasis patients and rodents reservoirs using PCR-RFLP in Damghan district]. J HamedanUniv Med Sci 2011; 17(4):5-9. [In Persian]

7-Ardahali S, Rezaei HR, Nadim A. Leishmania and leishmaniasis. 2nd ed. Tehran: Markazenashr Pub; 1994. [In Persian]

8-Rassi Y, Hanafi-bojd AA. Sand flies, the vectors of leishmaniasis. Tehran: Noavaran Elm; 2006. [In Persian]

9-Nadim A, Mesghali A, Seyedi-Rashti MA. Epidemiology of cutaneous leishmaniasis in Iran B. Khorassan. IV. Distribution of sandflies. Bull Soc Path ExotFiliales 1971; 64(6):865-70.

10-Yaghoobi-Ershadi MR, Zahraei-Ramezani AR, Akhavan AA, Jalali-Zand AR, Abdoli H, Nadim A. Rodent control operations against zoonotic cutaneous leishmaniasis in rural Iran. Ann Saudi Med 2005; 25(4): 309-12.

11-Hanafi-Bojd AA, Yaghoobi-Ershadi MR, Zamani Gh, Barzekar A, Jafari R, Pour Abazari G. [Epidemiological aspects of cutaneous leishmaniasis in Hajiabad district, Hormozgan province, 2003]. Hormozgan J Med Sci 2006; 10(1):63-70. [In Persian]

12-Doroodgar A, Dehghani R, Afzali H, Taghavi Ardekani A, Hooshyar H. [Study of human infection to cutaneous leishmaniasis (Salak) in Northwest part of Kashan, 1999]. Proceedings of the 3rd Congress on Parasitology; 29-31 January 2000; Sari, Iran. [In Persian]

13-Dehghani-Tafti AA, Hanafi-Bojd AA, Jafari R, Ehrampoosh MH. [Disease status of cutaneous leishmaniasis control program in the area covered by the Ardakan]. Yazd Univ Med Sci J 2003; 1:22-8. [In Persian]

14-Chegeni Sharafi A, Amani H, Kayedi MH, Yarahahmadi A, Saki M, Mehrdad M, et al. Epidemiological survey of cutaneous leishmaniasis in Lorestan province (Iran) and introduction of disease transmission in new local areas. J IlamUniv Med Sci 2011; 19(1):54-60. [In Persian]

15-Jacobson RL. *Leishmaniatropica* (Kinetoplastida: Trypanosomatidae)-- a perplexing parasite. Folia Parasitol (Praha) 2003; 50(4):241–50.

16-Hamzavi Y, Sobhi SA, Rezai M. [Epidemiological characters of cutaneous leishmaniasis referred patients to health centers of Kermanshah province in 2001-2006]. J Behbood 2009;13(2):151-61. [In Persian]

17-Mesgarian F, Rahbarian N, Mahmoudi Rad M, Hajaran H, Shahbaz F, Mesgarian Z, et al. Identification of Leishmania species isolated from human cutaneous Leishmaniasis in Gonbad-e-Qabus city using a PCR method during 2006-2007. Tehran Univ Med J 2010; 68(4):250-6. [In Persian]

18-Aflatoonian MR, Sharifi I. Frequency of cutaneous leishmaniasis among patients referred to the center for disease control in Bam district, 1999–2003. J RafsanjanUniv Med Sci 2006; 5(2):123-8. [In Persian]

19-Dehghan A, Ghahramani F, Hashemi B. [The epidemiology of anthroponotic cutaneous leishmaniasis (ACL) in Larestan, 2006-2008]. J JahromUniv Med Sci 2010; 8(3):7-11. [In Persian]

20-Zahirnia AH, Moradi AR, Norozi NA, Bathaii JN, Erfani H, Moradi A. [Epidemiological survey of cutaneous leishmaniasis in Hamedan province (2002-2007)]. J HamedanUniv Med Sci 2007; 16(1):43-7. [In Persian]

21-Doroodgar A, Mahbobi S, Nemetian M, Sayyah M, Doroodgar M. [An epidemiological study of cutaneous leishmaniasis in Kashan (2007-2008)]. J SemnanUniv Med Sci 2009; 10(3):177-84. [In Persian]

22-Abbasi A, Ghanbary MR, KazemNezhad K. [The epidemiology of cutaneous leishmaniasis in Gorgan (1998-2001)].Sci J Army Univ Med Sci 2004; 2(1):275-8. [In Persian]

23-Hamzavi Y, Foruzani AR, Mohebali M. [Frequency of cutaneous leishmaniasis in Bushehr province, 1983-1999]. Behbood 2001; 5(3):24-26.

24-World Health Organization. Report of a WHO expert committee: Control of the leishmaniasis. Geneva: WHO Tech Rep; 1990. Ser. No. 793.

25-Javadian E, Dehestani M, Nadim A, Rassi Y, TahvildarBidruniGh, SeyediRashti MA, et al. Confirmation of Tateraindica (Rodentia:Gerbillidae) as the main reservoir host of zoonotic cutaneous leishmaniasis in the west of Iran. Iran J Public Health 1998; 27(1-2):55-60.

26-Maraghi S, Samarbafzadeh A, Sarlak AA, Ghasemian M, Vazirianzadeh B. Identification of cutaneous leishmaniasis agents by Nested Polymerase Chain Reaction (Nested-PCR)in Shush City, Khuzestan

Province, Iran. Iran J Parasitol 2007; 2(3):13-5.

27-Saki J, Khademvatan S. A molecular study on cutaneous leishmaniasis lesions in Khuzestan province (South west of Iran). Jundishapur J Microbiol 2011; 4(4): 283-8.

28-Ghasemian M, Maraghi S, Samarbafzadeh AR, Jelowdar A, Kalantari M. The PCR-based detection and identification of the parasites causing human cutaneous leishmaniasis in the Iranian city of Ahvaz.Ann Trop Med Parasitol 2011; 105(3):209-15.

29-Maraghi S, Mardanshah O, Rafiei A, Samarbafzadeh A, Vazirianzadeh B. Identification of cutaneous leishmaniasis agents in four geographical regions of Khuzestan province using Nested PCR. Jundishapur J Microbiol 2013; 6(4). (In Press).

30-Yaghoobi Ershadi MR. Phlebotomine sand flies (Diptera: Psychodidae) in Iran and their role on Leishmania transmission. J Arthropod-Borne Dis 2012; 6(1): 1-17.

