



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

Hossein Elyasi<sup>1\*</sup>, Elaheh Masoudyar<sup>2</sup>, Sahar Salouri<sup>3</sup>

1. *Ph.D in Medical Parasitology, Microbiology Department, Faculty of Medicine, Sabzevar University of Medical Sciences, Sabzevar, Iran*
2. *Student of Public Health, Faculty of Public Health, Sabzevar University of Medical Sciences, Sabzevar, Iran*
3. *Student of Public Health, Faculty of Public Health, Sabzevar University of Medical Sciences, Sabzevar, Iran*

### ARTICLE INFO

**Received:**

08<sup>th</sup> Jan 2017

**Received in revised form:**

12<sup>th</sup> Jun 2017

**Accepted:**

21<sup>th</sup> Jun 2017

**Available online:**

14<sup>th</sup> Aug 2017

**Keywords:** *epidemiology, cutaneous leishmaniasis, Sabzevar*

### 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.

Copyright © 2013 - All Rights Reserved - Pharmacophore

**To Cite This Article:** Hossein Elyasi, Elaheh Masoudyar, Sahar Salouri, (2017), "Epidemiology of cutaneous leishmaniasis in Sabzevar from 2009-2013", *Pharmacophore*, **8(4)**, 66-71.

### 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

disease in humans include age, sex, socioeconomic status, nutrition status, suffering from a disease weakening the immunity system, and the existence of a sensitive population [3].

Cutaneous leishmaniasis in Iran is mainly resulted from *leishmania major* or *leishmania tropica*. Cutaneous leishmaniasis is of great importance as main health problem all over the world. 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 [4].

Twelve million people suffer from this disease, and 350 million people are at risk of suffering from this disease across the world. Every year, 2 million people get infected with this disease. Cases of cutaneous leishmaniasis have been reported from countries such as Afghanistan, Libya, Iraq, Iran, Jordan, Morocco, Saudi Arabia, Syria, Yemen, and Palestine [2].

Although the cases observed in Iran have not led to mortality, this disease is mainly significant for various reasons including prolonged ulcer period, high treatment costs, and its various complications [4].

The incidence rate of this disease has been estimated to be 28 cases in one thousand. The highest rate of incidence has been reported for Isfahan and Shiraz provinces with 1.66 cases in every one thousand, and the lowest rate of incidence has been reported for Mazandaran province with 0.22 cases in one thousand [5].

Over the last years, many studies have been conducted in different parts of Iran, and the prevalence of cutaneous leishmaniasis has been reported to be 2.5 percent in Isfahan, 5.34 percent in schools of Aran va Bidgol, and 27 percent in northeastern part of Natanz [4]. In the study conducted by Athari et al, they indicate that the prevalence of cutaneous leishmaniasis is increasing such that the number of positive cases of 2004 (28924 cases) have increased in comparison to that of 2000 (14050). This disease is endemic in 11 provinces of Iran, and its incidence has been reported to be more than 30 in one hundred thousand in 2004. Although provinces including Khorasan, Fars, and Isfahan have reported the highest number of cutaneous leishmaniasis, the incidence rates of the disease in Yazd and Bushehr provinces (in 2003 and 2004) has been reported to be 203.2 and 139.6 in one hundred thousand respectively [15]. Despite the increasing developments and achievements of the modern medicine in controlling diseases, leishmaniasis is still to be considered as one of the major health problems. Given the significant importance it gives to this disease, the World Health Organization has regarded it as one of the six important diseases of tropical and subtropical areas. The figures registered about those suffering from cutaneous leishmaniasis is 20 thousand cases in one year. However, some maintains that the figures are 4-5 times more than this official figures (20 thousand), and after Malaria, it is considered as one of the most important parasitic diseases in Iran [2].

At present, 12 million people suffer from this disease in different ways. The number of the new cases is reported to be 1.5 million cases of which on 600 thousand cases are reported formally. From this 1.5 million people, 1 million people suffer from cutaneous leishmaniasis. This disease is prevalent in many parts of Iran, and it is endemically prevalent in urban and rural centers. New centers of the disease have often developed in different parts of our country, and more people are involved with this disease. With its social and economic effects, this disease has often been always considered as important, and national planning has been arranged to fight and control this disease by the health executives. The studies conducted indicate that a high percentage of urban and rural population suffer from this disease [1].

## **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**

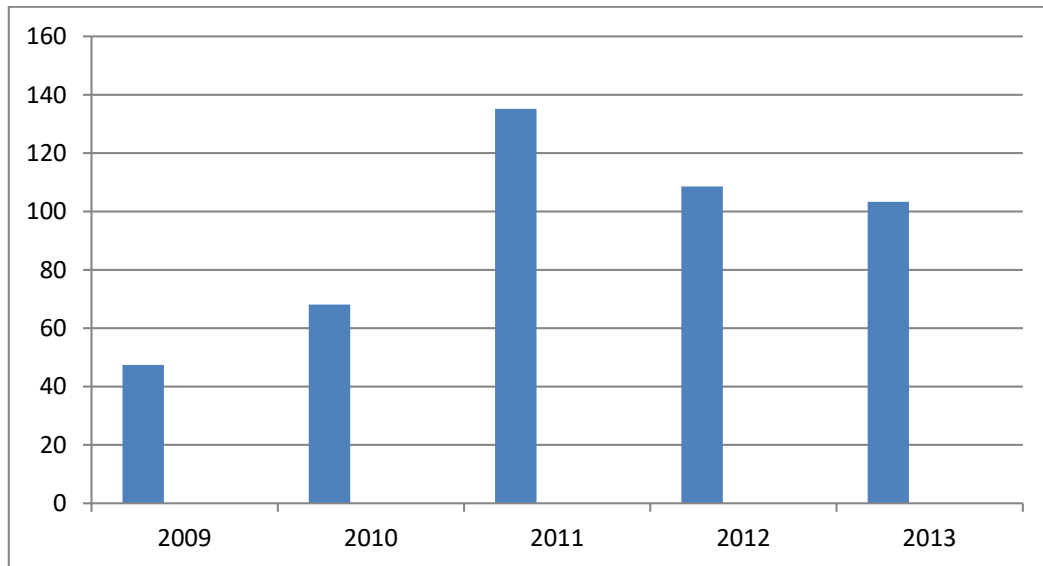
During 5 years, the number of cutaneous leishmaniasis cases has been reported to be 2158 cases in Sabzevar. Diagram 1 shows the incidence rate of cutaneous leishmaniasis in Sabzevar based on the years studied. The highest rate of incidence is for 2011 with 135.2 in 100 thousand (given the whole area's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

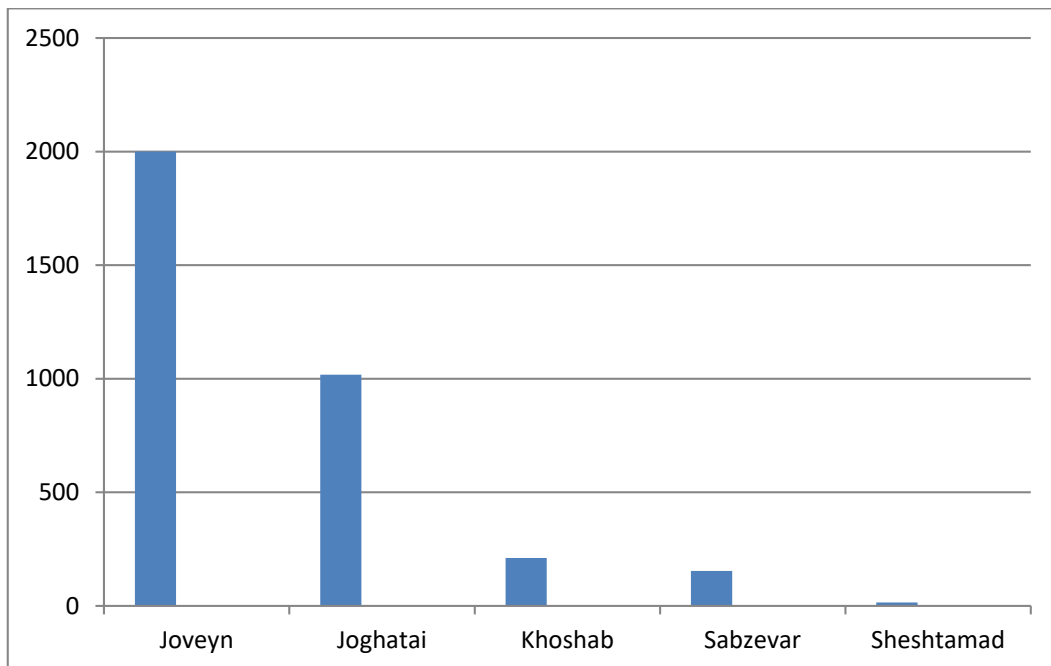
The patients' mean age was 31.08 with the standard deviation of 20.64. The most frequent age group was 20-40 years (33.4%), and the least frequent age group suffering the disease was 7-12 years (7.6%) (Table 1).

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)

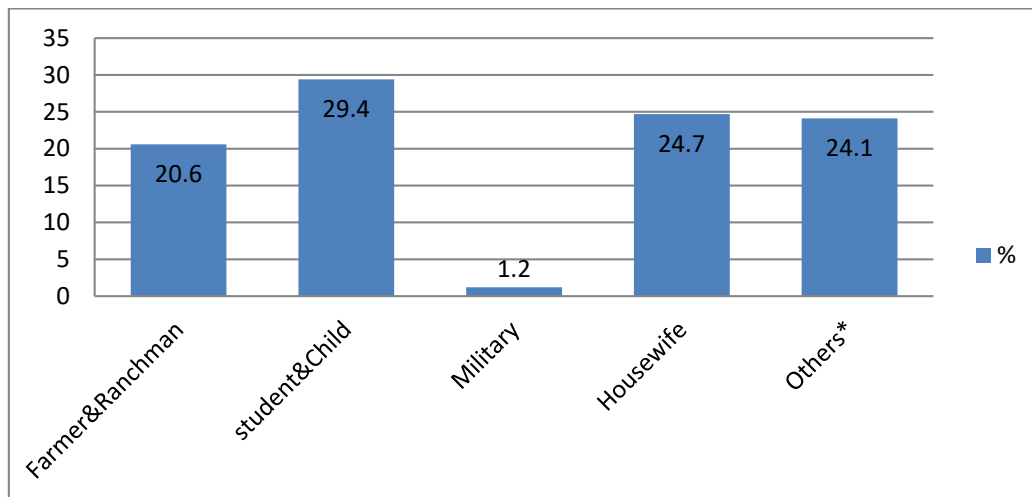


**Diagram 2.** The incidence rate of cutaneous leishmaniasis based on the geographical location in Sabzevar (in 100 thousand people)

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

	Number	percentage
--	--------	------------

Sex	male	1227	56.9
	female	931	43.1
Place of residence	city	346	16
	village	1812	84
Age group (years old)	<7	274	12.7
	7-12	164	7.6
	12-20	346	16
	20-40	722	33.4
	>40	652	30.3



**Diagram 3.** 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 Andimeshk 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 Azni 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 using clothes covering the entire body, and taking health measures such as collecting garbage and construction waste.

### Appreciation

The authors of the present study would like to thank Student Research Committee as well as the Health Deputy Chancellor of Sabzevar University of Medical Sciences for their cooperation with the present research project.

### References

1. Doroudgar A, Tashakor Z. The survey in effect of education on knowledge of Kashan teachers on Cutaneous leishmaniasis in 2000-2001. *Journal of Feyz*, 2003; Vol 27 (in Persian).
2. Ramezani Y, Mosavi Gh, Bahrami A, Fereidoni M, Parsan, Kazemi B. Epidemiological Cutaneous leishmaniasis in Aran and Bidgol city from April to September 2008. *Feyz*, 2011; 15(3):254-258 (in Persian).
3. Chegini Sharafi A, Amani H, Kayedi M, Yarahmadi A, Saki M, Nasiri A. An epidemiological survey of cutaneous leishmaniasis in the Lorestan province and introduction of new foci of local transmission in 2006. *Journal of Ilam University of Medical Sciences*. 2012; 19(1) (in Persian).
4. Ayatollahi J, Karimi M. The prevalence of cutaneous leishmaniasis in the Abar-Koh villages (Yazd). *Research Center for Infectious Diseases*. September 2005. (In Persian).
5. Mesgarian F, Rahbarian N, Mahmodirad M, Hajaran H, Shahbazi F, Mesgarian Z. The prevalence of cutaneous leishmaniasis and isolation of *Leishmania* Parasite from patient in Gonbade-Kavous Villages by PCR Technique during 2006-2007. *Tehran University Medical Journal (TUMJ)* 2010; 68(4): 250-256 (in Persian).
6. Zahirnia A, Moradi A, Norozi N, Nader bathaeij, Erfani H, Moradi A. An epidemiological survey of cutaneous leishmaniasis in the Hamedan province during 2002-2007. *Journal of Hamadan University of Medical Sciences*. 2009; Vol: 16; No: 51, (in Persian).
7. Nejati j, Majdam M, Hanafibojd A, Kayhani A, Habibinodeh F. An Epidemiological survey of cutaneous leishmaniasis in Andimeshk town ship. *Journal of Ilam University of Medical Sciences*. 2013; 21(7), (in Persian).
8. Khajehdaloee M, Yazdanpanah M, Seyyed Nozadi M, Fata A, Joya M, Masoudi M, et al. Epidemiology of cutaneous leishmaniasis in the Razavi Khorasan province in 2012. *Journal of Mashhad University of Medical Sciences*. 2014. Vol; 57; No: 4 (in Persian).
9. Doroudgar A, Mahbobi O, Nematian M, Sayah M, Doroudgar M. Epidemiology of cutaneous leishmaniasis in Kashan in 2008. *Journal of Semnan University of Medical Sciences*. 2009; 10(3), (in Persian).

10. Saghaipour A, Akbari A, Rani, Mostafavi R. Epidemiology of cutaneous leishmaniasis in Qom province during 2003-2009. Qom University of Medical Sciences. 2012; 6(1):83-88 (in Persian).
11. Roushani A, Yasami M, Jalilian M, Abdi J, Rezaie Taverani K. Epidemiology of cutaneous leishmaniasis in Ilam province. Journal of Shahid Beheshti University of Medical Sciences. 2012; 36 (1): 50-53 (in Persian).
12. Nilforoshzadeh A, Shirani Bidabadi L, Hosseini M, Fadaeinobari R, Jafari F. Epidemiology of cutaneous leishmaniasis in Isfahan province during 2001-2011. Journal of Isfahan Medical University. 2014, Vol: 32, No: 315, (in Persian).
13. Paghe A, Fakhar M, Sharif M, Danesh V, Ahmadi Z. Epidemiology of cutaneous leishmaniasis caused by *Leishmania tropica* in a new foci in Razavi Khorasan Province. J Mazand. Univ. Med. Sci. 2013; 23(103): 46-52, (in Persian).
14. Ahmadi N, Ghafarzadeh M, Jalali-gelosang A, Gholami-parizad A. An Epidemiological survey with emphasis on the incidence of cutaneous leishmaniasis in Kashan. Journal of Ilam medical University. 2013; 21(2), (in Persian).
15. Athari A, Jalalou N. Epidemiology of cutaneous leishmaniasis during the five years (2001-2006) in Iran. Journal of Isfahan Medical University. 2006. Vol 24 No: 82, (in Persian).
16. Hashyani A, Shirdareh M, Emadi J, Esfandiyari M, Pormohamadi B, Hosseini H. An Epidemiological study of cutaneous leishmaniasis in Marvdasht (Fars Province) during 2008-2009. Journal of North Khorasan Medical University of Medical Sciences. 2011; 3(4):15-25, (in Persian).
17. Sharifi I, Zamani F, Aflatonian M, Fekri A. A Report of Outbreak from cutaneous leishmaniasis in Baft (Kerman Province). Journal of Epidemiology. 2008. 4(1):53-58, (in Persian).
18. Hanafibajd A, Yaghobi-ershadi M, Zamani Gh, Barzehkar A, Jafari R, Porabazari Gh. Epidemiological aspects of cutaneous leishmaniasis in Haji Abad (Hormozgan province) during 2003. Journal of Hormozgan University of Medical Sciences. 2006; (1): 63-70, (in Persian).
19. Rafati N, Shapori-moghadam A, Ghorbani R. Epidemiology of cutaneous leishmaniasis in Damghan during 1999-2005. Journal of Semnan University of Medical Sciences. 2007; 8(4), (in Persian).
20. Babaei Gh, Shayan A. Study the Epidemiology of cutaneous leishmaniasis (CL) and emphasizing the scars, age group and sex in Paalam region, south of Lorestan. Journal of Yasoj University of Medical Sciences (Armeghan Danesh). 2003; Vol.: 8; No.:29, (In Persian).
21. Mohamadzani S, Nokandeh Z, Khorsandi A, Sanaeideh kordi A. Epidemiology of cutaneous leishmaniasis in Damghan. Journal of Military Medicine. 2010; 12(3):131-135, (in Persian).