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Research Article

Assessing Epidemiology of cutaneous leishmaniasis in kohgyloye & Boyerahmad province during 2009 to 2012

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ABSTRACT
Cutaneous leishmaniasis is a disease caused by infection with a unicellular leishmania. The cause of the disease is different in different parts of the world and it can lead to a range of problems from confusing facial appearance to severe and complicated lesions. This study that is descriptive and cross-sectional and retrospective was performed on patients with cutaneous leishmaniasis during the years 2009 to 2012. All patients referring to urban and rural health centers of Kohgiluyeh and Boyerahmad provinces, who had skin lesions suspected of cutaneous leishmaniasis, in order to confirm or reject the disease, they were subjected to laboratory studies (tissue smear and PCR) and patients with confirmed cutaneous leishmaniasis were included in the study. Their data were entered into a national questionnaire related to cutaneous leishmaniasis and then the data were analyzed.
Results: the average incidence of cutaneous leishmaniasis during the years 2009-2012 was 11.35 per 100,000 people. In this study, there is a significant relationship betweenthe frequency of cutaneous leishmaniasis based on gender, age and place of residence ($P < 0.05$), and the disease is more common in men, age group under 20 years old and those living in rural areas. In this study, the most common site of body involvement was face with a frequency of 33.9%. The highest incidence was related to students (28.7%). In most cases (% 65.7), the patient has only one skin ulcer. The most common type of lesion was wet lesion (42.6%) and most patients had a positive biographical history of travel one year before the disease. The frequency of cutaneous leishmaniasis in Kohgiluyeh and Boyer Ahmad province is lower than in other parts of the country which may be due to the geographical situation of the province (high and average altitude and low temperature), proper disposal of waste or economic conditions of the people of the province. It is necessary to study more accurately the relationship between the geographical situation of the province and the incidence of cutaneous leishmaniasis.
Keywords: cutaneous leishmaniasis, Epidemiology, Kohgiluyeh and Boyerahmad

INTRODUCTION:

Leishmaniasis and its variants:

Leishmaniasis contains a wide range of diseases that is caused by infection with different types of leishmania protozoan parasites. Although the diseases caused by infection with this parasite are high however, in general, leishmaniasis was classified into three types of visceral leishmaniasis (VL), coutaneous leishmaniasis or mucocutaneous leishmaniasis or MCLI (1). Diseases caused by Leishmania parasites: Leishmania donovani, Leishmania major, Leishmania Mexican, Leishmania tropica

Epidemiology:

Currently, leishmaniasis is seen in 88 countries across Asia, Europe, Africa and the Americas which among there are 72 developing countries

and 13 less developed countries [2 and 3]. The prevalence of this disease in the world is 12-14 million cases, with an annual incidence of 1.5 to 2 million cases, of which 500,000 are related to visceral leishmaniasis and the rest is related to cutaneous and cutaneous mucosal leishmaniasis. About 350 million people are at risk for this disease [4 and 5]. DALYs (Disabled adjusted life years) are estimated to be due to 946,000 Leishmaniasis for males and 16,100,000 for women. (6)

About 90% of visceral leishmaniasis occurs in deprived rural and urban areas in 5 countries of Bangladesh, India, Nepal, Sudan and Brazil and 90% of cutaneous leishmaniasis occurs in seven countries: Afghanistan, Algeria, Brazil, Iran, Peru and Saudi Arabia (7).

About 90% of the mucosal leishmaniasis in 3 Latin American countries includes Bolivia, Brazil and Peru (1)

It is one of the 10 most important diseases in the tropical region and the study on Tropical diseases in World Health Organization (WHO) ranked the disease as one of the first three diseases (African Tropianose, Dung and Leishmaniasis) and is a newly created and uncontrolled disease (8, 9).

According to report who based on a study conducted in the Middle East during 2003 and 2007, has highest incidence of illness per year in Iran (24,630 patients) and then Afghanistan (22,620 patients) and the least of them were Armenia, China and Kyrgyzstan with a zero per year rate which is estimated to be above the reported level (10). It seems that the need for an emergency care system to control or eradicating the disease (11 and 12).

Control methods:

Cutaneous leishmaniasis can be controlled by removing carriers, fighting infectious reservoirs in animal, genetic control methods in mosquitoes, and immunizing healthy individuals (13). In Iran, 15,000 people with cutaneous leishmaniasis annually reported, according to available research has actually been reported to be 4 to 5 times as large (13). The tool used to record clinical information and laboratory includes standard form for patients with cutaneous leishmaniasis.

RESEARCH METHODOLOGY:

This study is descriptive-cross sectional and retrospective study was carried out. The study has been conducted on registered information of patients with cutaneous leishmaniasis approved from the Center for Public Health. The treatment method by health centers was as follows:

All patients referring to urban and rural health centers of the province that had skin lesions suspected of cutaneous leishmaniasis were rejected or confirmed the presence of the disease by laboratory studies, in this way, tissue samples were prepared from the lesion's edge and sent to the laboratory for examination and was trained by an expert microbiologist under the guidance of Giemsa and under a microscope was observed. The cases of parasite magnesia in their tissue samples were treated with glucantime as definite patients. Then the following items include: age, gender, place of residence (city or village) occupation, date of onset of symptoms, diagnosis date, laboratory test for diagnosis performed, history of travel, history of the scars, location of the lesion, number of lesions, dry or wet lesions that are available in the national questionnaire on cutaneous leishmaniasis. Based on the information of each patient individually completed by a specialist responsible for the Department of Prevention and Control of Diseases of the Health Centers after entering the form of cases of cutaneous leishmaniasis, they reported to the provincial health center and then to the General Directorate of Diseases. The results were analyzed using SPSS and EXCEL software then, for the description of the results, statistical methods were used appropriately to the variables discussed. The main focus of this study was to investigate the epidemiologic status of Sickle in Kohgiluyeh and Boyer Ahmad Province during 2012-2009 and the research findings are presented in the form of the following tables and diagram:

RESULTS

According to the latest official census in 2006 and the statistics for Kohgiluyeh and Boyer Ahmad province were 634299 people and the population of Kohgiluyeh and Boyer Ahmad city in this census is 223982 and the population

of Kohgiluyeh and Boyer Ahmad city is 217741 people.

In this study, the number of patients with cutaneous leishmaniasis in 2009 was 59 and the incidence of disease was 3.9 per 100,000, iIn 2010, 81 people and the incidence of disease was 7.9 per 100,000, in 2011, 86 people and the incidence of disease were 5.13 per 100,000 people and in 2012, it was 63 and the incidence of disease was 9.9 per 100 thousand people. The number of cutaneous leishmaniasis in the province during the study period (2012-2013) was 289.

A. Descriptive data tables and diagram:

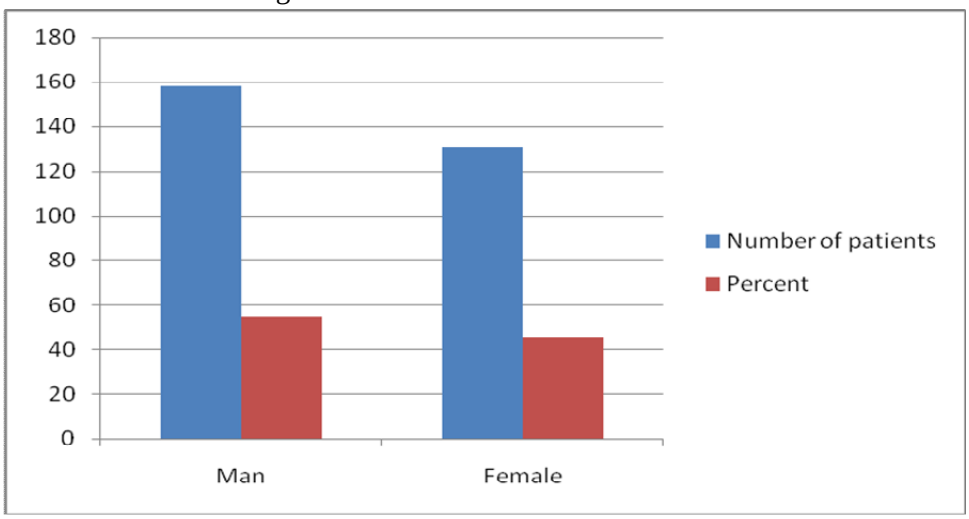

Diagram 1 distribution of prevalence of cutaneous leishmaniasis in Kohgiluyeh and Boyer Ahmad province during 2012-2009 by gender

As it is seen in the diagram, cutaneous leishmaniasis in men (54.7%) was more than women (45.3).

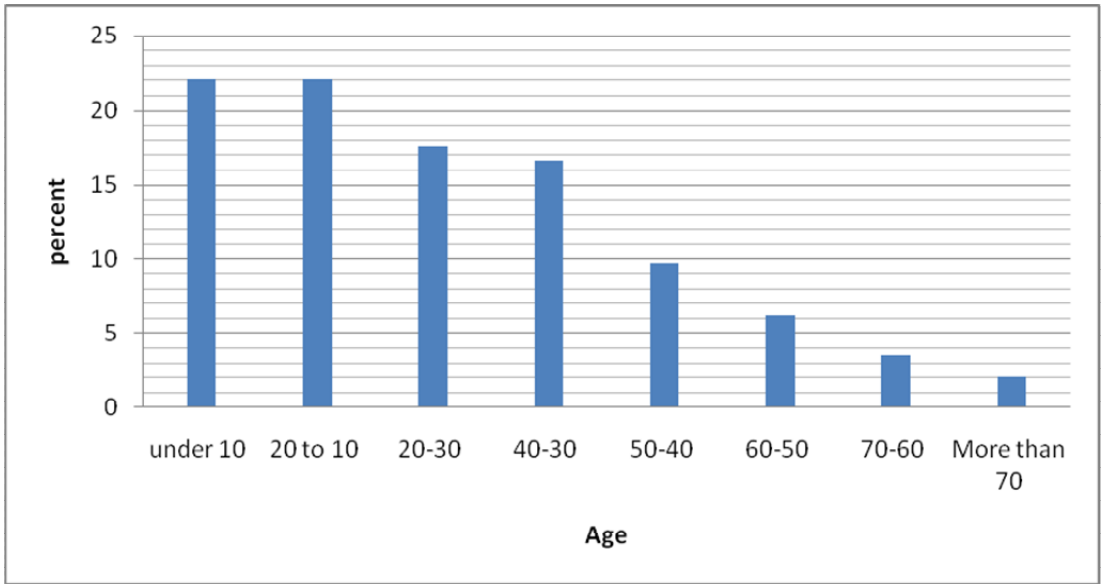

Diagram 2 distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009- 2012 by age

As shown in the chart above, most of the samples (44.2%) were under age 20. and only 2.1% of the samples are over 70 years of age.

Table 1. Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009- 2012 by year

year	Number of patients	Percent
2009	59	20.4
2010	81	28
2011	86	29.8
2012	63	21.8
total	289	100

As it is seen, the highest number of registered cases of cutaneous leishmaniasis in the province was in 2011 (29.8%).

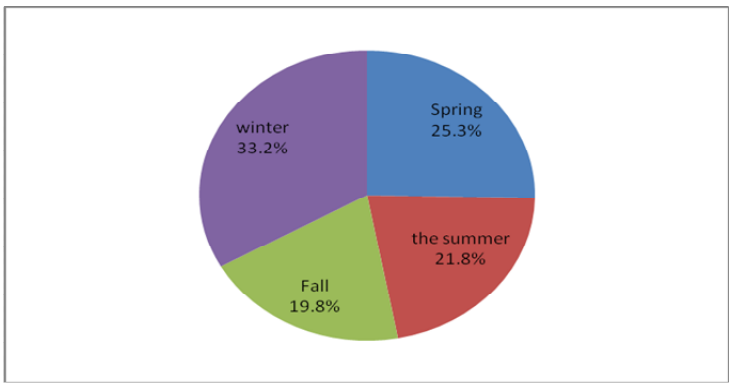

Diagram 3 distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2012-2009 by season

As it is seen, the highest number of registered cases of cutaneous leishmaniasis in the province was during winter (33.2%) and the lowest was recorded in the autumn (19.7%).

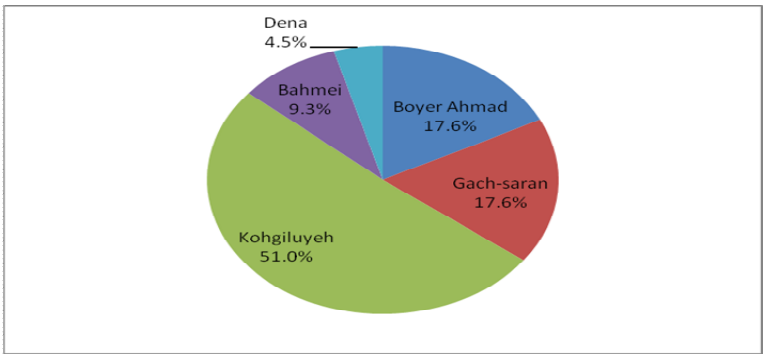

Diagram 4 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 by county

As can be seen, the highest number of cases of cutaneous leishmaniasis registered in the province belongs to Kohgiluyeh (51%) and the lowest is related to Dena (4.5%).

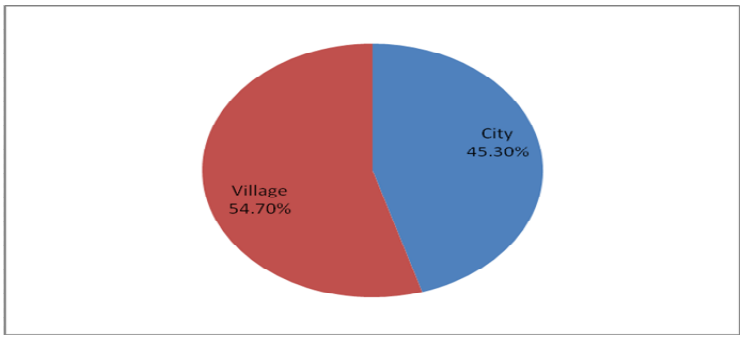

Diagram 5 Distribution of cutaneous leishmaniasis in prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 by location

As it is seen, the majority of people (54.7%) were rural residents.

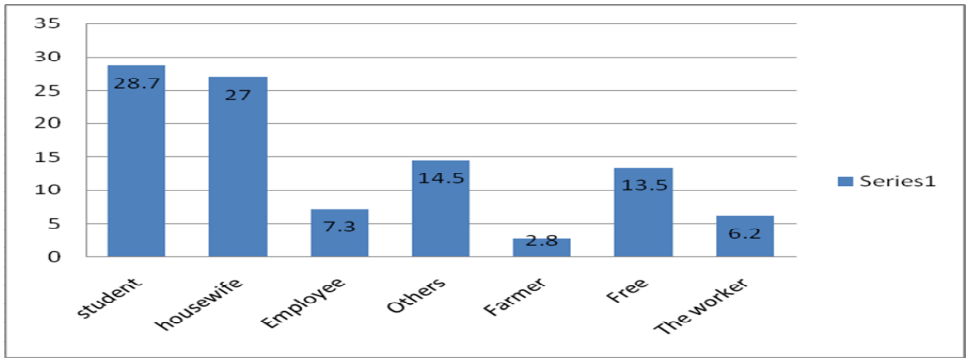

Diagram 6 Distribution of skin leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 in terms of occupation

As seen in diagram 5, highest percentage of patients related to students (28.7%) and the least of them belonged to farmers (2.8%).

Table 2 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 according to the history of travel in the past year

History of travel	Number of patients	Percent
yes	117	61.2
no	112	38.8
total	289	100

As seen in Table 2, most patients (61.2%) had a travel history in the past year.

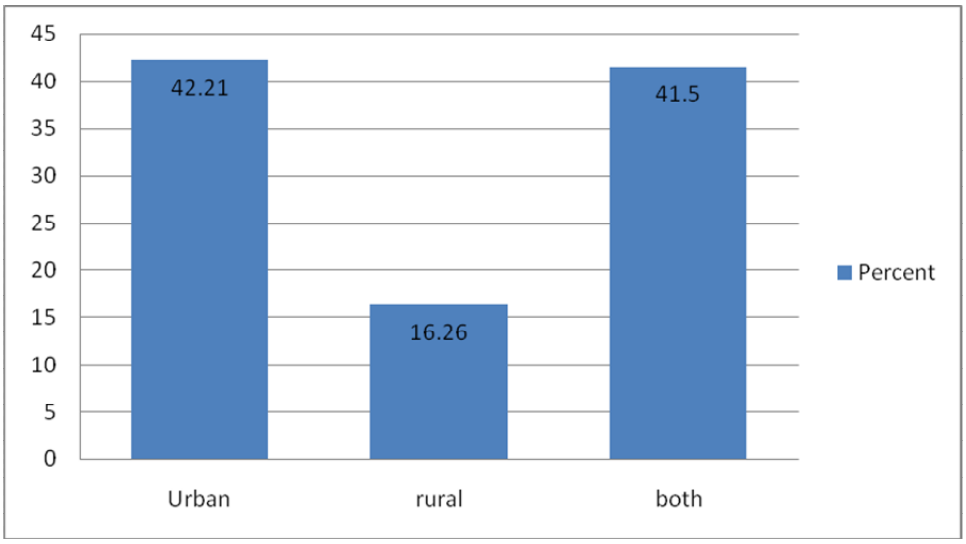

Diagram 7 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012, according to the place of travel

In most cases (42.2%), patients had only traveled to urban areas.

Table 3 Distribution of skin leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 according to the history of cutaneous leishmaniasis

history of Oscar Sickle	Number of patients	Percent
yes	32	11.1
no	257	88.9
total	289	100

As you can see, most of the samples (88.8%) did not have a cutaneous leishmaniasis history.

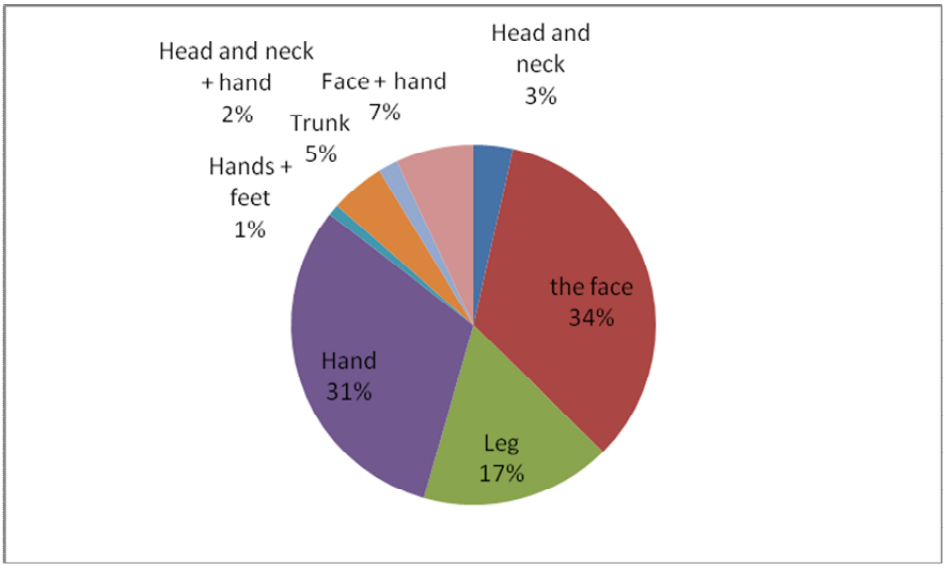

Diagram 8 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2012 to 2009 according to the location of the lesion

As you can see, the most common site of conflict and lesion is in facial infections (33.3%).

Table 4 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 based on the history of other family members

history of other family members	Number of patients	Percent
yes	26	9
no	263	91
100	289	total

As noted in Table 4, 91% of the patients did not report any history of other family members. Table 5 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 in terms of lesion size

Lesion size (centimeters)	Number of patients	Percent
Less than a centimeter	23	7.8
1 centimeters	92	31.8
2 centimeters	62	21.4
3 centimeters	22	7.8
4 centimeters	11	3.8
5 centimeters and more	79	27.6
total	289	100

As noted in Table 5, most lesions (53.2%) were in the range of 1-2 cm, and 27.6% were 5 cm and over.

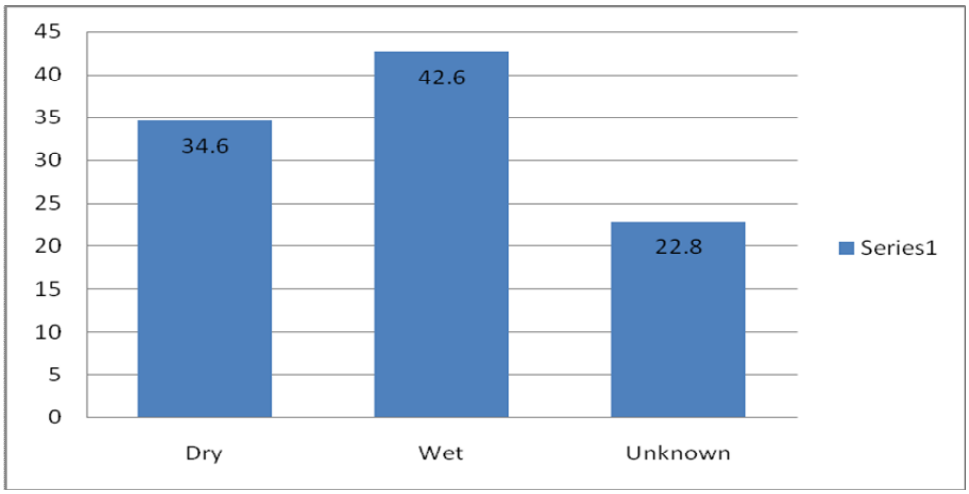

Fig. 9 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 in terms of lesion shape

As you can see, most of the lesions (42.6%) were wet lesions.

Table 6 Distribution of cutaneous leishmaniasis prevalence in Kohgiluyeh and Boyer Ahmad province during 2009-2012 by number of lesions

number of lesions	Number of patients	Percent
1	190	65.7
2	47	16.3
3	26	9
4	13	4.5
5 and more	13	4.5
total	289	100

As it is seen, in most cases (65.7%), the patient had only one lesion in their body.

FINDINGS:

To analyze the significance relationship between variables, inferential statistical tests (such as Chi-square, T-test, etc.) were used and the significance level of 0.05 was analyzed and the results were obtained as follows:

The results of the data analysis showed that most of the cases (54.7%) were male and the frequency of cutaneous leishmaniasis was statistically significant ($p < 0.05$). The distribution of leishmaniasis in different ages varies with the highest incidence of disease in the age group under the age of 20 years. This difference was statistically significant ($p < 0.05$). Most of the people living in the village are

(60.9%) and the difference is statistically significant ($p < 0.05$).

Different parts of the body with different proportions were sequestered and the difference was statistically significant ($p < 0.05$). The most common place of involvement and lesion in face patients (9.33%) was the frequency of cutaneous leishmaniasis in different occupations. The difference is statistically significant ($p < 0.05$) and the highest percentage of patients related to students (28.7%) and the least of them belonged to farmers (2.8%). The difference in the number of lesions is not statistically significant ($p < 0.05$) and in most cases (65.7%), the patient had only one lesion in their body. The prevalence of wet lesions (42.6%) is higher than the lesions, as the prevalence of rural leeches is more prevalent in urban areas. The majority of patients (61.2%) had a positive history of travel within one year before the onset of illness, which in most cases travels to the city (42.2%) and then the city and village jointly (5.41%).

DISCUSSION AND CONCLUSION

Based on this study, the incidence of the disease in 2009 was 9.3 per 100,000 people. In 2010, the incidence of disease was 12.7 per 100,000 people. In 2011, the incidence of illness was 13.5 per 100,000 and the mean annual incidence of illness in the years 2009-2012 was 11.35% per 100,000, while the incidence rate in a study carried out by Mesagarian et al (15) in Gonbad-Kavas was 500 per 100,000 (05%). In a study by Sharafi et al (17) in the city of Baft, the incidence rate was 12300 per 100,000 (3.12%). In a study by Karami et al (18) in Isfahan province, the incidence of the disease was 60,900 per 100,000 (105 per thousand). In a study by Vigel et al (25) in Colombia the incidence of disease varied from 280 to 2040 per 100,000 people (2.8-20.4). In a study by Jones et al (26) in Brazil, the incidence of disease was 810 per 100,000 (8.1 per thousand) people. According to the above, the incidence rate in Kohgiluyeh and Boyerahmad province is low compared to the above mentioned cases that may be related to the geographical situation of the province. Although there has been no study on the relationship between the geographical situation of Kohgiluyeh and Boyer Ahmad province with the incidence of cutaneous leishmaniasis but in a study by Qatee et al (22)

In Fars province, it was determined that the prevalence of visceral leishmaniasis in Fars province with the rainfall and mean temperature was directly correlated with the altitude of the sea level.

Kohgiluyeh and Boyer Ahmad province are located at higher altitudes above the adjacent provinces (the height of Yasuj from the sea level is 1816 m, Shiraz is 1519 m and Isfahan is 1570 m) and the average temperature is 18° C. Considering the studies carried out elsewhere in the country and the world, it may be possible to justify the low incidence of disease in the province with two factors of temperature and height. In Kohgiluyeh city, which is located at lower altitudes and has higher air temperatures, the incidence of the disease has also increased, the population of Kohgiluyeh city according to the last official census (2006) is 223982 people and the population of Boyer Ahmad city was 21.7741, although, according to this study, Kohgiluyeh population is larger than the population of Boyer Ahmad, but does not seem this low difference (6421) in the population of the counties can justify a significant difference in the incidence of cutaneous leishmaniasis in these two cities. Proper disposal of garbage can be a reason for the low incidence of disease. It may also be that the disease has not been adequately treated or that patients have neglected their illness and did not seek treatment. Of course, it can be attributed to the poor economic situation of the people of the province and the lack of revenue to pay for diagnosis and treatment. However, the carelessness of doctors in diagnosing a disease may be another cause for this low level of incidence.

In this study, the prevalence of the disease based on gender (male and female) was such that the prevalence of the disease in men was 54.8% and in women it is equal to 45.3%. Therefore, the prevalence of the disease in men is higher and the frequency of cutaneous leishmaniasis has a significant relationship with gender ($p < 0.05$). The result of this study was consistent with the result of a study by Dorothgar et al (16) in Gonbad Kavoos, Marzieh Karami et al (18) in

Isfahan, Abbas Roghani et al (20) in Ilam, Mohammed al-Samarraei et al (23) in Iraq, Kocarslan et al (24) in Turkey, Jones et al in Brazil (26) and Vigel et al (25) in Colombia and the result of study was inconsistent with the result of study by Ranjbar Tutoee et al (19) in Javadieh in Rafsanjan. Mesghran et al was not found a significant correlation between disease and gender (male and female) in Gonbad-e-Kavoush study (15).

The more likely cause of this illness in men the more likely they are to become more active outside the home. In this study, the highest frequency of disease was in the age group under 20 years old. The result of this study was consistent with the result of study by Mesgarian et al (15), Sharafi et al (17), Karami et al. (18), Ranjbar Tutoee et al (19), Jones et al (26), and Kocarslan et al (24) and in all of these studies, the most common age group was under the age of 30 but in the study of Dordogar et al, most common age group was the age group of 30-39 years old. It seems that the cause of the higher incidence of this disease in this age range is the desire to play out of home and usually they do not have appropriate cover to cover different areas of the body.

In this study, the highest number of patients was in the rural area (60.9%), which was different from the results of Roughani et al it seems that the cause of this disease in rural areas is the contact of more rural people with pets, including wild boars, which are considered as a reservoir of disease.

In this study, it was found that the prevalence of cutaneous leishmaniasis is more than the other parts of the body is consistent with the results of the study by Kocarslan et al (24) in Turkey and contrary to the studies of Mohammad al-Samaraie et al (23) in Iraq, Ranjbar Tutoee et al (19) in Rafsanjan and Mesgarian et al (15) in Gonbad-e-Kavos and Ayatollahi et al (14) in Yazd. In all of these studies, the most common site was the upper extremity, except in the study of Mesgarian et al (15) that the most common site is leg cramps. In all studies, it seems that the outbreaks of the body are most susceptible to insect bites and are the most common sites with ulcers. In this study, it was found that the prevalence of cutaneous leishmaniasis in students is higher, which the result was inconsistent with the result of the study of Ayatollahi et al (14) in which there was no significant relationship between the frequency of illness and occupation. Given the fact that students are mostly under the age of less than 20 years of age, they are more likely to suffer from the illness because of the reasons.

In this study, the number of skin lesions varied from one patient to another and most of the patients had a wound (65.6%) this conclusion is consistent with the results of Ayatollahi et al (14) and Dordogar et al. (16), and the results of the studies was consistent with the result of study of Mohammed al-Samaari et al (23), Sharafi et al (17) and Mesgarian et al (15) was different.

In most patients, the wound was of a wet type, which was consistent with the results of the studies by Mohammad al-Saamraei et al (23), Ayatollahi et al (14), and Mesgarian et al (15) and the results of the study was inconsistent with the result of study of Ranjbar Tutoee et al (19). Considering the higher frequency of wound healing in this province, it can be concluded that leishmania major can be a more common type of leishmania in this province. The study found that most patients had a positive history of traveling to urban and rural areas. This conclusion is inconsistent with the study of Ranjbar Tutoee et al (19).

Although in this study the travel factor was considered as a risk factor for the disease, but what is important about the disease in the patient's history of travel is the importance. The history of traveling patients to endemic areas of the disease, and considering that travel to endemic and non-endemic regions has not been segmented in this study; it can not be determined whether travel has a role in the disease in patients with this study or not.

5- 2 CONCLUSION:

In this study, the incidence rate in Kohgiluyeh and Boyerahmad province was lower than in other parts of the country which may be due to the geographical situation of the province, including high altitude from the sea level and low temperature in many parts of the province (mean 18 degrees of province) that provides

conditions reduce the incidence of disease in this province relative to the adjacent provinces. It is also possible that the proper disposal of garbage and the elimination of skin ulcers (given that the ulcer is painless in most cases) due to the low level of economic status of a large percentage of the province's population (given that the Kohgiluyeh and Boyer Ahmad Province are part of the deprived areas of the country) and so, without referring to a physician, there may be other reasons for this low incidence of disease in the province, the latter may be due to the increased diagnosis of the disease in winter. One of the causes of low prevalence can be the lack of referral to the doctor or the lack of reports by the doctor.

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