Polytechnic Journal

Polytechnic Journal

Volume 8 | Issue 3 Article 6

11-1-2018

INCIDENCE OF CUTANEOUS LEISHMANIASIS AMONG PATIENTS PRESENTED TO HAWLER TEACHING CENTRE FOR DERMATOLOGY DISEASES, ERBIL-IRAQ, FROM JANUARY 2015 TO DECEMBER 2017

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How to Cite This Article

ShakirAgha, Nabaz Fisal; Yaseen Al-khayat, Zakariya Abdullah; and FatahAlharmni, Kawthar Ibrahim (2018) "INCIDENCE OF CUTANEOUS LEISHMANIASIS AMONG PATIENTS PRESENTED TO HAWLER TEACHING CENTRE FOR DERMATOLOGY DISEASES, ERBIL-IRAQ, FROM JANUARY 2015 TO DECEMBER 2017," *Polytechnic Journal*: Vol. 8: Iss. 3, Article 6.
DOI: https://doi.org/10.25156/ptj.2018.8.3.247

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Abstract

Background and objective: To determine the incidence of cutaneous leishmaniasis (CL) in Erbil province. Methodology: A cross-sectional, descriptive study was performed in the Hawler teaching center for dermatology diseases and carried out with the collaboration of prevention Health Department, Erbil Medical Technical Institute, Erbil Polytechnic University, with Department of Microbiology and Anatomy & Histology, College of Medicine, Hawler Medical University, Erbil, Iraq. All the patients who presented at the dermatology clinic during the period from January 2015 to December 2017 were referred cases from health centers outside Erbil center. A small amount of aspirated fluid was taken and smeared on a clean glass microscope slide then left it to dry, then fixed using 70% methanol for 30 seconds and left it to dry again. The diagnosis was dependent mainly on clinical examination in addition to Giemsa stain. Results: During the study period, the total skin diseases cases which were referred to this center was 2871, while the number of cutaneous leismaniasis among the total dermatological cases was 1938 (67.5%) and the highest number of cases 848 (43.8%) was in the year 2016.All patients were referred from two districts in Erbil governorate: Makhmur & Kalak.Makhmur district had the highest percentage of cases1407 (72.6%) with P-value (P ≤0.01). Rural patients were of higher number and percentage in comparison to urban 1083 (55.9) with P-value (P ≤0.01). Regarding occupation, the highest percent of cases was in children 650 (33.5%) followed by students 462(23.8%). The highest number of cases was recorded during February 663(34.2%) & January 369 (19%) while the lowest rate of cases was registered during July 4(0.2%).The participant's ages ranged from 10 months to 61 years. Males had the highest percentage of distribution than females 1129(58.3%) with P-value (p≤ 0.05).Males were distributed in a higher percentage in regarding to both age groups of (below & above 15 years) as 671(60.3%) 458(55.4%) respectively and P-value (p≤ 0.05).Clinically, 51.4% of patients had one lesion P-value (P ≤0.01), 52.3% of patients had wet type P-value (P ≤0.01). Most lesions were found on both limbs (56.9%) with P-value (P ≤0.01). According to stain results, 1372(70.8%) of the cases were positive to Giemsa stain while 566 (29.2%) cases clinically diagnosed by an experienced dermatologist. Conclusions: Cutaneous leishmaniasis is endemic in Makhmur & Kalak districts .Males was infected in higher percent than females and this may be due to cultural, occupational and social factors

Polytechnic Journal: Vol.8 No.3 (Aug 2018): Pp.: 102-120
http://epu.edu.krd/ojs/index.php/Journal
https://doi.org/10.25156/ptj.2018.8.3.247

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Abstract

Background and objective: *To determine the incidence of cutaneous leishmaniasis (CL) in Erbil province.*

Methodology: *A cross-sectional, descriptive study was performed in the Hawler teaching center for dermatology diseases and carried out with the collaboration of prevention Health Department, Erbil Medical Technical Institute, Erbil Polytechnic University, with Department of Microbiology and Anatomy & Histology, College of Medicine, Hawler Medical University, Erbil, Iraq. All the patients who presented at the dermatology clinic during the period from January 2015 to December 2017 were referred cases from health centers outside Erbil center. A small amount of aspirated fluid was taken and smeared on a clean glass microscope slide then left it to dry, then fixed using 70% methanol for 30 seconds and left it to dry again. The diagnosis was dependent mainly on clinical examination in addition to Giemsa stain.*

Results: *During the study period, the total skin diseases cases which were referred to this center was 2871, while the number of cutaneous leismaniasis among the total dermatological cases was 1938 (67.5%) and the highest number of cases 848 (43.8%) was in the year 2016.All patients were referred from two districts in Erbil governorate: Makhmur & Kalak .Makhmur district had the highest percentage of cases1407 (72.6%) with P-value (P ≤0.01). Rural patients were of higher number and percentage in comparison to urban 1083 (55.9)*

with P-value (P ≤0.01). Regarding occupation, the highest percent of cases was in children 650 (33.5%) followed by students 462(23.8%). The highest number of cases was recorded during February 663(34.2%) & January 369 (19%) while the lowest rate of cases was registered during July 4(0.2%).The participant's ages ranged from 10 months to 61 years. Males had the highest percentage of distribution than females 1129(58.3%) with P-value (p≤ 0.05).Males were distributed in a higher percentage in regarding to both age groups of (below & above 15 years) as 671(60.3%) 458(55.4%) respectively and P-value (p≤ 0.05).Clinically, 51.4% of patients had one lesion P-value (P ≤0.01), 52.3% of patients had wet type P-value (P ≤0.01). Most lesions were found on both limbs (56.9%) with P-value (P ≤0.01). According to stain results, 1372(70.8%) of the cases were positive to Giemsa stain while 566 (29.2%) cases clinically diagnosed by an experienced dermatologist.

Conclusions: *Cutaneous leishmaniasis is endemic in Makhmur & Kalak districts .Males was infected in higher percent than females and this may be due to cultural, occupational and social factors.*

Key Words: epidemiology, cutaneous leishmaniasis, Makhmur, Kalak, children, endemic.

1-INTRODUCTION:

Leishmaniasis is a group of diseases caused by the blood flagellate *Leishmania*. These parasitic diseases are considered as the most common, serious vector-borne protozoal diseases and the second main cause of morbidity, after malaria, in the world (1). In eighty eight (88) countries, more than 12 million persons are infected with leishmaniasis. It is well known that near 2 million new cases of CL discovered annually in Afghanistan, Algeria, Iran, Iraq, Saudi Arabia, Syria, Brazil and Peru (2). Lately, vector-borne parasitic diseases such as leishmaniasis have been arisen or re-emerged in many geographical territories and generate an international health and economic worries and fears that encompass humans, home animals and wild life (3). The ecology and epidemiology of leishmaniasis are influenced by the host (human), reservoir animal and vector (sand fly) interrelations .Remarkable factors that had an obvious impact on the emergence and propagation of leishmaniasis comprise environmental factors such as variations in temperature and water storage, irrigation habits, climate alterations, poor socio-economic situations and low level family (3,4).

Two stages are known in the *Leishmania* life cycle : the intracellular amstigote form within macrophages of vertebrates and promastigote stage in the gut of invertebrate host(5). In endemic and developing countries such as Iraq in which culture or Polymerase

chain reaction techniques are not routinely available in laboratories, the diagnosis is mainly depends up on the clinical features of the lesion in addition to the staining a smear from the lesion by Giemsa stain (6,7,8).

Cutaneous leishmaniasis cases have intensively been studied in Iraq (9, 14); however the epidemiological and clinical characteristics regarding Erbil Governorate have not been well documented. Therefore the present study was carried out to describe the epidemiologic conditions of cutaneous leishmaniasis in Erbil Governorate.

2- MATERIALS AND METHODS

2.1- Study protocol:

This is cross-sectional, descriptive study conducted during the period January 2015 to December 2017 performed within Hawler teaching center for dermatology Diseases and carried out with the collaboration of prevention Health Department, Erbil Medical Technical Institute, Erbil Polytechnic University, with Department of Microbiology and Anatomy & Histology, College of Medicine, Hawler Medical University, Erbil, Iraq. A total of 2871 patients with different skin lesions were referred to the Hawler teaching center for dermatology Diseases. The diagnosis was dependent mainly on clinical examination in addition to Giemsa stain:

2.2- Ethical considerations:

This study (January 2015 to December 2017) was approved by both the Ethics Committee of Hawler Medical University, Erbil and the Committee of Erbil Medical Technical Institute, Erbil Polytechnic University, Iraq.Informed consent was obtained from all participants.

2.3- Clinical examination:

This fundamental step was accomplished by an experienced dermatologist. Patients were examined to evaluate the CL lesion: site, number, size, duration, and type whether wet or dry. A special questionnaire was filled through a direct interview with the patients and included age, gender and residence.

2.4- Parasitological examination:

Samples from cutaneous lesions were taken by fine needle aspiration as follows:

1-The skin around the lesion was disinfected by 70% ethanol.

2-By a sterile syringe of 1ml containing 0.2 ml of sterile normal saline was injected intradermal through intact skin in to the active red border of the lesion.

3- The injected fluid aspirated till the bloody stained fluid observed in the syringe.

4- Small volume of aspirated fluid was taken and smeared on a clean glass microscope slide and left it to dry, then fixed using 70% methanol for 30 seconds and left to dry.

5- The fixed, dried smears were stained with Geimsa stain for 20 minutes and then rinsed with tap water. The stained smears left to dry at room temperature then examined under oil immersion lens of the light microscope (Olympus CH2, Japan).

6-Amastigote was diagnosed as round or spherical shape with distinctive kinetoplast. In this case was declared positive. When no amastigote was seen after 15 minute of inspection, the smears was declared negative (4, 5, and 8).

2.5- Statistical analysis:

The data analysis was performed using descriptive statistics, including mean ± S.E, frequency, and frequency percentage. Comparisons were made using Chi x2 test using standard equations. A P value of $p \leq 0.05$ was considered statistically significance.

3- RESULTS:

Over the period from January 2015 to December 2017, a total of 2871 patients with different skin lesions were presented to the Hawler teaching center for dermatology Diseases. Of those, 1938 patients (67.5%) were diagnosed as having CL. The youngest patient was 10 months of age and the oldest was 61 years.

Figure -1:- Shows the distribution of CL cases according to the years. The highest of morbidity cases 848 (43.8%) was in the year 2016.While the Cutaneous leishmaniasis morbidity in 2015&2017 were 298(15.3), 792(40.9) respectively.

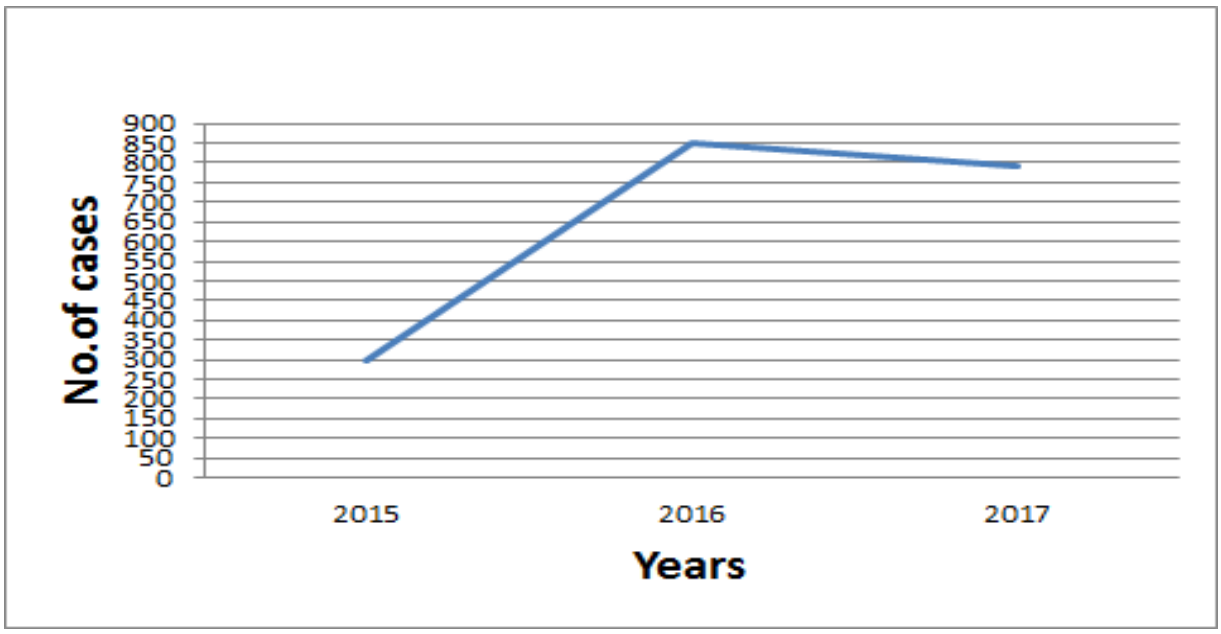

Figure -1:- Annual distribution of cutaneous leishmaniasis morbidity among patients presented to Hawler teaching centre for dermatology diseases, from January 2015 to December 2017.

Table -1- Shows the distribution of cutaneous leishmaniasis according to the districts of Erbil .It is noted clearly that the highest percentage of cases 1407(72.6%) was in Makhmur district. The difference in the numbers of patients of both districts was highly significant P-value is (P ≤0.01).

Table -1:- Distribution of CL cases according to districts of Erbil Governorate

District	N	%
South of Erbil (Makhmur district)		
Makhmur	432	
Queir	95	
Malakara	63	
Kendinawa	309	
Qaraj	324	
Baqrat	148	
Sum	1407	72.6%
West of Erbil (Kalak district)		
Kalak(xabat)	121	
Mala Amour	46	
Chama bubis	50	
Safia	102	
Xaland	98	
Kegitli	114	
Sum	531	27.4%
Total numbers	**1938**	**100%**
***** P-value is <0.001. The result is highly significant (P ≤0.01)		

Table -2:- Illustrates the distribution of CL cases according to the gender and residency. The table show that, CL was highest in male1129 (58.3%).The difference in the numbers of patients of both genders was highly significant P-value is (P ≤0.01). Regarding residency, the highest numbers of patients were of rural residents (55.9%). The difference in the numbers of patients of both residencies was highly significant P-value is (P ≤0.01).

Table-2:- Distribution of CL cases according to the residency.

Characteristics	N	(%)
Residency		
Urban	855	44.1
Rural	1083	55.9
Total	1938	100%
The P-value is <0.001. The result is highly significant (P ≤0.01)		

Figure -2:- Demonstrates the distribution of CL cases according to the occupations .The highest percent of cases in children 650 (33.5%) and students 462(23.8%) followed by Employee 129 (6.7), Gainer 121(6.2), Housewives 139 (7.2), Retired 76 (3.9), Worker 111 (5.7), Farmer 134 (6.9), Shepherd 116 (5.9) respectively.

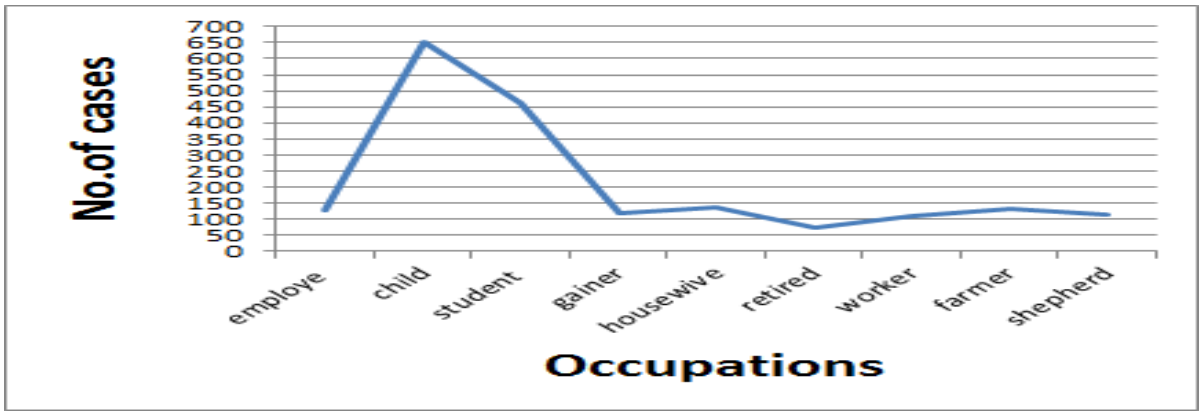

Figure – 2:- Occupational distribution *of cutaneous leishmaniasis among patients presented to Hawler teaching centre for dermatology diseases, from January 2015 to December 2017*

Figure-3:-Reveals that the highest rates of infection were recorded during February 663 (34.2%) & January 369 (19%) while the lowest rate was registered during July 4(0.2%).Out of which the percentages of monthly distribution of CL patients during March 129(6.7), April 48(2.5), May 19 (0.9), July 4 (0.2), August 12 (0.6), September 23(1.2), October 56 (2.9), November 342 (17.7) respectively.

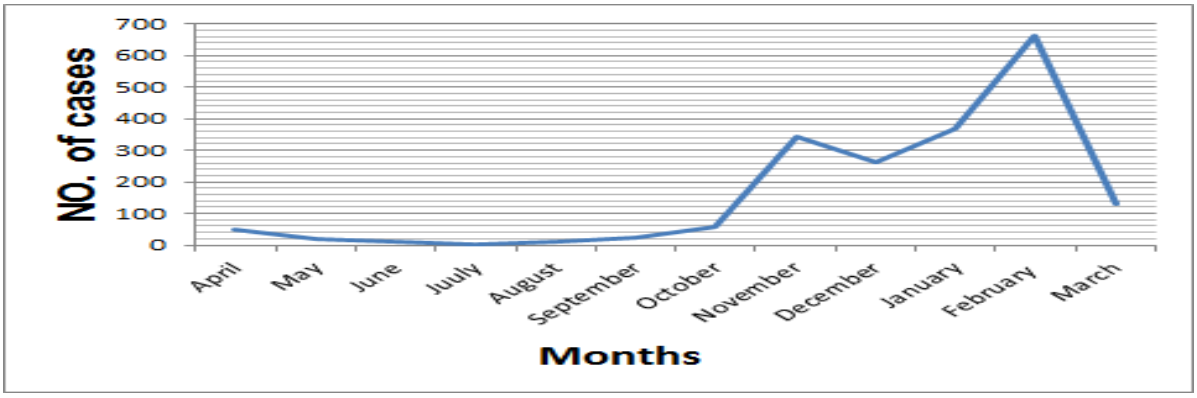

Figure – 3: -Temporal distribution of cutaneous leishmaniasis in different months of the year, among patients presented to Hawler teaching centre for dermatology diseases, from January 2015 to December 2017

Table -3:- Exhibits that in both age groups < 15 & ≥ 15 years .Patients of below 15 years of age had the highest number and percentage 1112(57.4%). The percentage of male patients distribution were 60.3% & 55.4 % respectively , and those both percentages were higher than those of females percentages (58.3%) in the aforementioned both age groups . The statistical analysis revealed a significant difference ($p \leq 0.05$) in the distribution of males and females patients in both age groups < 15 & ≥ 15 years.

Table- 3: - Distribution of gender according to the age groups (above & below 15)

Age(yrs.)	Male N (%)	Female N (%)	Total N (%)
< 15	671 (60.3%)	441 (39.7%)	1112 (57.4%)
≥ 15	458 (55.4%)	368 (44.6%)	826 (42.6%)
Total	**1129 (58.3%)**	**809 (41.7%)**	**1938 (100%)**
*P-value is 0.030738.The result is Significant at ($p \leq 0.05$)			

Table -4:- Manifests the distribution of CL cases according to the clinical features of the lesions. The lesions with the highest percentage of distribution were characterized by: duration of 2-4 months(63.8%) , limbs involvement (56.9%), one lesion(51.4%), wet type lesion (52.3%) , and of 1.5X2cm-2.5X3cm (65.5% %) . The highest number of skin lesions per case which was recorded in this study was 5.The differences in the distributions of the mentioned lesion features were highly significant P-value ($P \leq 0.01$).

Table – 4: - Distribution of CL cases in relation to the clinical features.

Characteristics	N	(%)
Duration (months)		
< 2	261	13.5
2-4	1237	63.8
>4	440	22.7
*P-value is <0.001. The result is highly significant (P ≤0.01)		
Site of the lesion		
Limbs	1103	56.9
Face	574	29.6
Abdomen& trunk	261	13.5
*P-value is <0.001. The result is highly significant (P ≤0.01)		
Number of Lesion		
1	997	51.5
2	803	41.4
≥ 3	138	7.1
*P-value is <0.001. The result is highly significant (P ≤0.01)		
Type of lesion		
Wet	1014	52.3
Dry	924	47.7
*P-value is <0.001. The result is highly significant (P ≤0.01)		
Diameter of the lesion		
0.5X1cm-1.5x2cm	382	19.7
1.5X2cm-2.5X3cm	1095	56.5
≥ 2.5X3 cm	461	23.8
*P-value is <0.001. The result is significant at P ≤0.01		

Regarding the results of parasitological examination, positive Giemsa stain was positive in 1372 cases (70.8 %) table -5-.

Table -5:- Results of parasitological examination by Giemsa stain.

Result	N	%
Positive	1372	70.8 %
Negative	566	29.2 %
Total	1938	100 %

Figure -4:- Shows the distribution of different lesions regarding: site, size number, gender and age.

Figure -4:- Cutaneous leishmaniasis lesions in a sample of patients presented to Hawler teaching centre for dermatology diseases, from January 2015 to December 2017.

Figure -5:- Illustrates the amastigote stage obtained from cutaneous lesion stained by Giemsa stain.

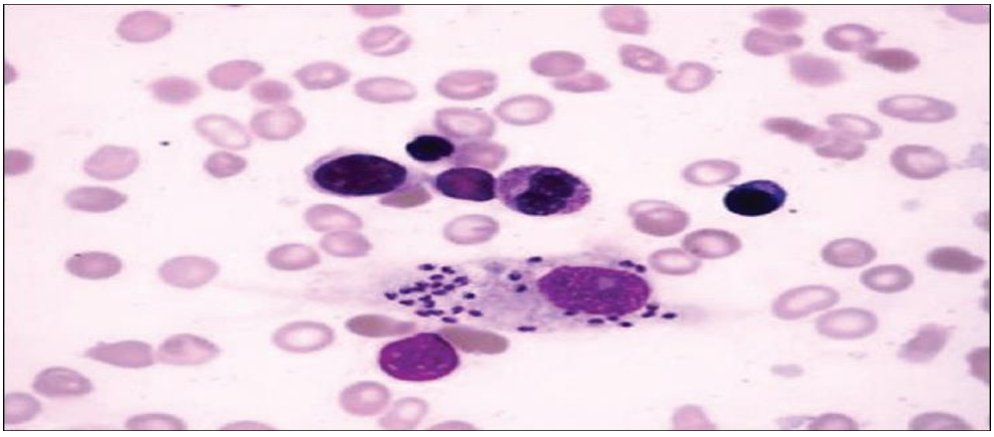

Figure -5:- Amastigote from cutaneous lesion .Giemsa stain .100X

4-DISCUSSION:

Over the period from January 2015 to December 2017, a total of 2871 patients with different skin lesions were presented to the Hawler teaching center for dermatology Diseases. Of those, 1938 patients (67.5%) were diagnosed as having CL.

The present study clarified that the highest frequency of the disease had been documented in 2016 with (43.8%).While the CL morbidity in 2015&2017 were 298(15.3), 792(40.9) respectively.The present results that demonstrated a high percentage of the cases of CL may be attributed to the outbreak cases of CL in Iraq in 2015 which had been explained as a result of emigration events in different regions of the country. The war of terrorist and military operation which correlated with emigration may be considered as a main cause of prevalence of disease. Emigrant camps may be foci of this type of disease and finally transform the disease to the towns and cities (28). In accordance with the results of this study, the highest reported cases in North of Baghdad and in West of Iraq are correlating with the emigration movements in these regions (29). The results clarified that the percentage of CL reported cases in Erbil were increased from (0.03%) in year 2008 to (43.8%) in the year 2016, therefore in 2016, CL cases were mostly related by the occurrence of an outbreaks (14).

Regarding the lowest percentage of CL cases in Erbil form (2008-2015) which is mentioned above, may be linked to the absence of the vector of disease, the sand fly which prefers the tropical and sub-tropical regions (30). A database from Iraqi CDC (Communicable Diseases Control Centre) at the Ministry of Health/Baghdad, which studied the distribution of CL cases from (2008-2015) in Iraq had concluded that the highest reported cases of CL was recorded in 2015 (4000 cases) in per cent of (23.5%)(31). A study in Jordan by (32) had concluded that the establishment of Syrian refugee camps possesses a high risk for the introduction of leishmaniasis into areas which were considered to be free of the infection.

The present study showed that cutaneous leishmaniasis is prevailed in South of Erbil (Makhmur district) 1407(72.6%) with signification of the different between geographical distribution represented by provinces and the numbers of CL cases with P-value ($\leq$0.01).

Makhmur district area located between other geographical endemic areas in Iraq such as Alhaweja in Kirkuk, Sharqat in Mosul and Samara in Tikrit city. This result is in accordance with the study achieved by which showed a high infections rate range in these endemic areas (33). This result is in agreement with studies done by in Iraq .Furthermore, this rate was higher than those reported for other geographical areas in Iraq. In two community-based studies, the incidence was 2.5 case / 10,000 for Tikrit (34) in 2000 and 15 cases / 10,000 for Kirkuk city (35) in 2000. Additionally, in a hospital-based study performed in Samara (36),

the incidence rate was 5.5 cases / 10,000 for the year 1994.Our findings were supported with previous studies which reported that five provinces of Iraq are considered as foci of leishmaniasis as Mosul, Baghdad (33).

In this study, rural inhabitant had higher rates of infection than urban. The result of this study is in congruence with that of both studies (16, 21) in which the percentages of the rural patients were 56.9% & 51.61% respectively. Makhmur district is regarded as a rural area. There are many factors that play an important role in the presence and distribution of CL in this district, including the presence of animal reservoirs, the location near the Great Zab River, and the use of clay to build some of the houses in villages that belong to this district area. Furthermore, as an agricultural area, Makhmur district attracts and harbors many kinds of insects; therefore, its population works long hours in the farms where they are more exposed to insects bites (12, 13, and 19).

The present study stated that the highest percent of cases was in children 650 (33.5%) and students 462(23.8%) followed by Employee 129 (6.7), Gainer 121(6.2), Housewives 139 (7.2), Retired 76 (3.9), Worker 111 (5.7), Farmer 134 (6.9), Shepherd 116 (5.9) respectively.

Occupational disease defines a change in a workers health caused by chemical,environmental, biological, psychological, or other work-related factors. Cutaneous leishmaniasis and muco-cutaneous leishmaniasis are listed as occupational diseases by the Brazilian Health Ministry (37). The high rate of infection in children which had been observed in the present study may be related to the opportunity of children to be exposed to the parasite more than adult as they play outdoor more (14,16).

The present study showed that The highest number of cases was recorded during February 663(34.2%) & January 369 (19%) while the lowest rate of cases was registered during July 4(0.2%). Monthly distribution demonstrated that in winter months (January &February) the highest numbers of CL cases were reported. This result is in agreement with that obtained by (14) in which the highest percent of CL cases(29.4%) for the period (2008-2015) were observed in February ,whereas the lowest percent were noted in July (0.7%). The result of the present study was also in concurring with a study achieved by (9) in Tikrit /Iraq in which the incidence rate was maximized in October, January, and February. It is clear that the spectacular increment in the prevalence of CL cases in Iraq is due to the highly distribution of sand flies. Factors which have a considerable impact on the distribution of sand flies may comprise local environmental factors (as humidity and temperature), physical factors (as geographical barriers and habitat availability), and biotic factors (as an abundance of vertebrate hosts). Climatic factors as rainfall, winds and temperature may be considered as the

most paramount factors influencing the distribution of sand fly species (2, 4, and 14). Additionally, the emerging peaks of cases are probably related to the incubation period of the disease and seasonal activity of the sand fly vectors that extend from August and September for this region after which a peak of infections was recorded until next year's February(2,9,14).

In the present study, males were prone to be infected by CL as higher numbers of cases were in males (58.3%) with P-value ($p \leq 0.05$) which was significant. This result is in accordance with a studies done by (2,9) in Iraq in which males were representing 56% & 57% of the cases respectively .Studies elsewhere, in Turkey and Iran, concluded no association between the gender and the rate of infections (10, 11, 12, and 13). Additionally a survey was done in Iraq over the period from (2008-2015) in which the total reported cases were 17001 and the male infection (50.8%) was more than female infection (49.2%) (14). In contrast to the above, a study in Turkey had detected a higher rate in females (53.84 %) (15). In addition, another study in Al-Yarmouk hospital Baghdad (16), had noted a higher percent of CL in females (56%).The contradictory in the above mentioned studies may be related to many factors such as size, design of the study population, in addition to climatic variations (10, 14, 15, and 16). The higher rate of CL among males in the present study was probably due to many factors. For example , a sociocultural factor may have a role here as the cultural habits of using covered dresses by women, which decreases the chances of the bites and being at home before evening, the onset of the period of sand fly activity as observed by (2,14,17). In addition, men are probably traveling more for work while women were restricted to the house, which is another likely factor for the higher rate in males (18, 19).

The present study clarified that the incidence rate of CL infection was 57.4% in patients less than 15 years old group. This high result is in agreement with results from Pakistan (19), Turkey (11) and Greece (20) in which the percentages were (54.7%), (53.6%), (55.8%) respectively. In endemic regions, a useful indicator of endemicity of the disease is the incidence of CL in children (2, 14, and 18).

In this study the rate of infection in 15 years age and above was 42.6% which was significant P-value ($p \leq 0.05$). This result is differed from that obtained by (9) in which the incidence rate of CL infection was 57%, while it is lower than that reported for Colombia (86%) (21), but in accordance with those findings reported from Turkey (45%) (15). The poorly developed immune system in children might be another factor that made children more susceptible to infected as it is noted that elderly persons have a low rate of infection and this might be due to

previous exposure to the parasite or actually get infected over childhood period which made them immune to subsequent exposure to the parasite (15, 19, 11).

The highest duration of the disease manifested in this study was duration of 2-4 months with a percent of (63.8%) which was highly significant P-value (P≤0.01). A study by (2) stated that half of the CL cases (50%) were had duration of lesions under 2 months .Other studies assumed that the duration of lesions was a minimum of 1 month and a maximum of 19 months (12, 13, 14, 18).These differences in the durations may be related to the different species or strains of leishmania causing infection or it may be related to the differences in the immune status of the patients involved in these studies (14, 23). Several studies had delineated the vital functions fulfilled by cytokines which are manufactured by CD4 T cells in defending against human leishmaniasis as they stimulate the macrophages to arrest and destroy the parasites. Ample recent studies had shed light on the role exhibited by CD8 T cells as these cells collaborate in the discrimination of Th1 responses in the early events of parasite infection, where as they take part in lesion development after establishment of the infection. The existence of these cells supplemented by their cytotoxic activity has a direct liaison to the lesion size (20, 23, and 24). Studies in populations living in endemic areas had proposed that certain clinical manifestations may have a linkage to a specific gene locus. Genetics of the host could provide pivotal information for the disclosure of key phases in the pathogenesis of Leishmania infections (25).

The higher proportions of the lesions were located on the limbs (56.9 %), face (29.6%), abdomen &trunk (13.5%) which was highly significant P-value (P≤0.01). These observations are in conflict with studies in Iraq (2) & Turkey (15) in which face was the highest site involved, as the results were (43.5%) and (58.52%) respectively .In comparison, other studies by (14,18) noted that CL lesions occurred mainly on both limbs in a rate of (75%) & (69.3%) respectively. The distribution of the lesion is mainly linked to the behavior of the vector. Phlebotomous prefer to attack the uncovered parts of the body, in addition, sandflies choose to feed from convenient chosen sites with specific chemical attractions such as concentration of carbon dioxide which obviously was recognized by the insects more from the feet and hands(2,5,15,16).

Considering lesions number, the prevalence were as such: single lesion (51.5%), two lesions (41.4%) and three or more lesions (7.1%) which was highly significant P-value (P≤0.01). These findings were varied from a study by (9) in which the results were (42% one lesion, 58 % multiple lesions). Other study by (17) had concluded that 36% of patients had single lesion while double and more lesions were distributed over the remaining patients .The present

findings differ from that of Akcali in which (71%) had one lesion and the remaining had multiple lesions(15). The abundance of lesions can be due to the feeding behaviors of sandflies as they are doing numerous and various bites , presence of high numbers of infected sandflies or rubbing and scraping of the bite site may aid in dissemination of the protozoa to other regions (3,12,13,19).

Regarding classification of CL, most studies have divided CL into 2 major forms (wet and dry), without considering the pathogenesis (9, 20).In the present study, the wet type was more frequently noted (52.3% versus 47.7%) which was highly significant P-value ($P \leq 0.01$).

Al-Mafraji had claimed that (36.5%) of the lesions were of dry type while 63.5% were of wet type (16). A study by (11) demonstrates that wet lesions were observed more frequently (81.3%) than dry type (18.7%).Previously, the wet type lesion had not been detected in Iraq (14). Studies by (14,22) speculated that during the Iraq-Iran war (1980-1988)there was a crossing and re-crossing of armed forces over the international borders with Iran and because this form of the disease was common in western Iran, it may be suggested that the disease started to cross the borders with the soldiers or the gerbils (the reservoir of the disease)of the area .

The present study delineate that Giemsa stain has a detection rate of 1372(70.8 %) while 566 (29.2%) cases clinically diagnosed by an experienced dermatologist .This result is close to that acquired by (9,22) in which the rates were 73% & 69.5% respectively. Factors that hamper the success of microscopic detection of amastigotes are the number of parasites present and duration of lesions .Thus, inability to identify the amastigotes does not warn off a diagnosis of CL and such infection in endemic areas may be recognized on the ground of their clinical features as leishmaniasis (7,21). Mohammed had postulated that recognition of amastigotes at particular stages of the disease is unattainable (26). Although the disease process is still continuous, the failure of recognition such cells infected with amastigote forms, assumed that these phagocytes, giant cells, macro-phages and monocytes, at specific point of the disease process become resistant to be infected with the amastigotes. Recent studies had speculated that amastigotes which are replicated in macrophages and then freed out into the extracellular fluid, become incapable for the next time , to assault and thus to replicate in another macrophages again. This disability is elucidated by an immune interaction between the host immune system and the leishmania parasite determinants which causes the emanation and building of resistance in the phagocytes against the parasites. This aforementioned inference may interpret the disappearance of the amastigotes at certain phases of the disease (24, 25). Hepburn clarified that over the subsequent months of the disease process, there is a piecemeal decrease in the number of amastigotes and

macrophages, which consequently will lead to the construction of granulomatous infiltrate consisting of lymphocytes, epithelioid cells and multinucleate giant cells. Hence accordingly giemsa stain will be negative (27).

5. CONCLUSIONS:

In conclusion, this study elucidates that cutaneous leishmaniasis is a serious public health challenge in districts of Makhmur and Kalack in Erbil governorate and its banning must be one of the health directorate priorities .

6. RECOMMENDATION:

It is recommended that more ambitious researches on the clinical, environmental, co-infections and resistance predictors of Leishmania in endemic areas to be achieved. Health education via the public media and trainings should be accomplished by governmental agencies in collaboration with research institutions. Fully protection during transmission season, using bed nets, insecticides and reservoirs' control should be also mentioned in the planning.

7. ACKNOWLEDGMENT:

The authors would like to thank the Health Directorate of Erbil and staff of health centers of Makhmur and Kalack districts for their assistant during the study period. Special thanks are directed to the heads and staffs in Zoonotic Diseases of Erbil prevention health Directorate, Hawler teaching center for dermatology Diseases, dermatology Consultant at Rizgare Teaching Hospital for their kind assistance and encouragement. We appreciate the co-operation of parents who allowed their children to participate in the study.

8. CONFLICT OF INTEREST:

The author declares that there is no conflict of interest in this study.

REFERENCES:

1- World Health Organization, 2010.Control of the leishmaniasis.Report of a meeting of the WHO expert committee on the control of Leishmaniases.WHO Technical Report Series. Geneva: (949), 22–26 March.

2- Abdulsadah A.Rahi, 2013. Cutaneous Leishmaniasis in Iraq: A clinico epidemiological descriptive study. Sch. J. App. Med. Sci., 1(6), p:1021-1025.

3- Ready PD, 2013.Biology of Phlebotomine sand flies as vectors of disease agents. Ann Rev Entomol, 58, p:227-250.

4- Patz JA, Graczyk TK, Geller N, Vittor AY, 2000.Effects of environmental change on emerging parasitic diseases. Int J Parasit, Nov; 30, p: (12-13).

5- Tabibian E, Shokouh SJH, Dehgolan SR, Moghaddam AD,Tootoonchian M, Noorifard M, 2014.Recent epidemiological profile of cutaneous leishmaniasis in Iranian military personnel. J Arch Mil Med. February; 2(1), p: e14473.

6- Shujan R. Hassan 2017.Epidemiological Study of Cutaneous Leishmaniasis in Tuz.*Int. J. Curr.Microbial. App. Sci,* 6(1), p: 477-483.

7- Dehghani R, Kassiri H, Mehrzad N, Ghasemi N,2014.The prevalence, laboratory confirmation, clinical features and public health significance of cutaneous leishmaniasis in Badrood city, an old focus of Isfahan Province. Journal of Coastal Life Medicine; 2(4), p: 319-323.

8- Dawit G, Girma Z, Simenew K, 2013.A review on biology, epidemiology and public health significance of leishmaniasis. Journal of Bacteriology & Parasitology, 4:166, ISSN: 2155-9597.

9- Al Samarai AM, AlObaidi HS, 2009 .Cutaneous leishmaniasis in Iraq. J Infect Developing Countries; Mar 1; 3(2), p: 123-129.

10- Kassiri H, Kassiri A, Lotfi M, Farajifard P, Kassiri E, 2014.Laboratory diagnosis, clinical manifestations, epidemiological situation and public health importance of cutaneous leishmaniasis in Shushtar County, Southwestern Iran. J. Acute Dis.vol. 3(1), p: 93-98.

11- Aytekin S, Ertem M, Yağdıran O, Aytekin N, 2006.Clinico-epidemiologic study of cutaneous leishmaniasis in Diyarbakir Turkey. Dermatology J., 12 (3), p: 14-17.

12- Khosravi A, Sharifi I, Dortaj E, Aghaei Afshar A, Mostafavi M, 2013.The present status of cutaneous leishmaniasis in a recently emerged focus in south-west of Kerman Province, Iran. Iranian Public Health J., 42(2), p: 182-187.

13- Kassiri H, Mortazavi HS, Kazemi SH., 2011.Epidemiological study of cutaneous leishmaniasis in Khorram-Shahr County, Khuzestan Province, South-West of Iran. Jundishapur J Health Sci; 3(4), p: 11-20.

14- Al-Obaidi MJ, Abd Al-Hussein MY,Al-Saqur IM, 2016.Survey Study on the Prevalence of Cutaneous Leishmaniasis in Iraq.Iraqi Journal of Science; Vol. 57, No.3C, p:2181-2187.

15- Akcali C, Culha G, Inaloz HS, *et al.*, 2007.Cutaneous leishmaniasis in Hatay. Turk Acad Dermatol J., 1 (1), p: 1-5.

16- Al-Mafraji KH, Al-Rubaey MG, Alkaisy KK, 2008 .Clinco-Epidemiological Study of Cutaneous Leishmaniasis in Al-Yarmouk Teaching Hospital. Iraqi J. Comm. Med. Jul. Vol. 12, No.21, p: 6-15.

17- Wesam Sbehat, 2012.Epidemiology of Cutaneous Leishmaniasis in the Northern West Bank, Palestine. Master Thesis in Public Health, Faculty of Graduate Studies,An- Najah National University, Nablus, Palestine.

18- Ahmadi NA, Modiri M, Mamdohi S, 2013.First survey of cutaneous leishmaniasis in Borujerd county, western Islamic Republic of Iran. East Mediterr Health J. Oct; 19(10), p: 847-853.

19- Hussain M, Munir S, Khan TA, Khan A, Ayaz S, Jamal MA, *et al.*, 2018.Epidemiology of cutaneous leishmaniasis outbreak, Waziristan, Pakistan. Emerg Infect Dis. J., Jan; Vol. 24, No. 1, p: 159-161.

20- Gkolfinopoulou K, Bitsolas N, Patrinos S, Veneti L, Marka A, Dougas G,*et al.*, 2013. Epidemiology of human leishmaniasis in Greece 1981 - 2011. Euro Surveillance J., Jul 18; 18(29),p: 1-8.

21- Medina-Morales DA, Machado-Duque ME , Machado-Alba JE, 2017.Epidemiology of Cutaneous Leishmaniasis in a Colombian Municipality. Am J Trop Med Hyg.Nov; 97 (5), p: 1503-1507.

22- El-Deen LD, Abul-Hab J, Abdulah SA, 2006.Clinico-epidemiological Study of Cutaneous Leishmaniasis in a Sample of Iraqi Armed Forces.Iraqi J. Comm. Med. April; 19 (2), p:98-103.

23-BañulsAL, Bastien P, Pomares C, Arevalo J, Fisa R, Hide M,2011.Clinical pleiomorphism in human leishmaniases, with special mention of asymptomatic infection. Clin Microbiol Infect J., Oct; 17(10), p: 1451-1461.

24- Shimizu Y, Takagi H, Nakayama T, Yamakami K, Tadakuma T, Yokoyama N, *et al.*, 2007. Intraperitoneal immunization with oligomannose-coated liposome-entrapped soluble leishmanial antigen induces antigen-specific T-helper type immune response in BALB/c mice through uptake by peritoneal macrophages. Parasite Immunol J., May; 29(5), p: 229-239.

25- Nogueira MF, Goto H, Sotto MN & Cuc´e LC, 2008. Cytokine profile in montenegro skin test of patients with localized cutaneous and mucocutaneous leishmaniasis. Rev Inst Med Trop Sao Paulo, November-December; 50 (6), p: 333-337.

26- Mohammed WD, 2017.Toward an approach for cutaneous leishmania treatment.Our Dermatol Online J., septmber; 8(1), p: 81-90.

27- Hepburn NC, 2003. Cutaneous leishmaniasis: an overview. Postgrad Med. J., Jan-Mar; 49(1), p: 50-54.

28- World Health Organization, 2003. Communicable Disease Toolkit, IRAQ CRISIS, p: 1-105.

29- Korzeniewski K., 2006.The epidemiological situation in Iraq. *Przeglad epidemiologiczny*, 60(4), p: 845.

30- Ferro,C., López , M., Fuya, P., Lugo, L., Cordovez, J.M. and González, C. 2015.Spatial Distribution of Sand Fly Vectors and Eco-Epidemiology of Cutaneous Leishmaniasis Transmission in Colombia. *PloS one*, 10(10), p: e0139391.

31- Ali, M.A., Rahi, A.A. and Khamesipour, A. 2015.Species Typing with PCR–RFLP from Cutaneous Leishmaniasis Patients in Iraq. *Donnish Journal of Medicine and Medical Sciences*, 2(3), p: 026-031.

32- Kamal Jehad Hijjawi, 2016.The Impact of Syrian Immigration on the Prevalence of Cutaneous Leishmaniasis in Jordan. Master Thesis in Medical Laboratory Sciences, Faculty of Graduate Studies at the Hashemite University Zarqa, Jordan.

33- Niazi, A.D.1980.Studies in epidemiology and sero epidemiology of visceral leishmaniasis in Iraq.PhD thesis, London School of Hygiene & Tropical Medicine. DOI: uk.bl.ethos.

34- Alaa NH 2002. Epidemiology of skin diseases in Tikrit and vicinity: a community based study.M Sc thesis, Tikrit University College of Medicine.

35- Murtada SJ. 2001. Epidemiology of skin diseases in Kirkuk. MSc thesis, Tikrit University College of Medicine,

36- Alsamarai AGM, 2009.Prevalence of Skin Diseases in Samara, Iraq. J Infect Developing Countries; 3(2), p:123-129.

37- Shaw J. 2007.The leishmaniasis-survival and expansion in a changing world.The mini-review. Memories of the Oswaldo Cruz Institute, Aug. 2007; vol.102 no.5, p: 541-546.