Plant Archives Vol. 20, Supplement 2, 2020 pp. 2733-2736 **e-ISSN:2581-6063 (online), ISSN:0972-5210**

EPIDEMIOLOGICAL STUDY Of CUTANEOUS LEISHMANIASIS IN KIRKUK PROVINCE, IRAQ

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Abstract

Cutaneous leishmaniasis is one of the endemic parasitic diseases that cause health problems in Iraq, the present study was done on Cutaneous leishmaniasis epidemiological aspect in Kirkuk province and included 728 suspect infected persons from the beginning of October 2018 to the end of December 2019. The results of the current study showed that the percentage of infected males was (58.2%) higher than the percentage of infected females (41.8%), and it found the highest percentage of infected was found in age group (0-10) as it reached (47%) and the lowest percentage of infected was in the age group (51-60) (0.7%) . The study also showed that the highest peak of infection was in February (24.5%) and the lowest infection rate was in July (0.7%). The geographical distribution of infected cases was referred to the highly rate of infected cases found in Hawija district (46.6%) and the lowest infection rate in Kirkuk district (14.2%). It was also found that the majority of ulcers in the affected people was single (53.8%), while the percentage of multiple ulcers in the affected people (46.2%), The incidence of skin disease leishmaniasis and location of ulcers in the body where the highest percentage found in the upper and lower extremities (21.3%) while the lowest infection rate in the neck, amounting to (0.7%). Smears were taken from lesions, air dried, fixed and Giemsa stained then microscopically examined for detection amastigote stage in Cutaneous leishmaniasis.
***Keywords*:** Epidemiology, Cutaneous leishmaniasis, Kirkuk.

Introduction

Leishmania are protozoan parasites belongs to the haemo-flagellates within mononuclear phagocytes as intracellular amastigotes in human and other mammals and as flagellated extracellular promastigotes in the gut of their sand fly vectors (Roberts, 2009). *Leishmania* exists in three forms cutaneous, muco cutaneous and visceral leishmaniasis. Cutaneous leishmaniasis is the most dispersed form, leading to a dry or moist sore on the skin (Alvar, 2012).

The symptoms differ in the regions, according to the species of parasite and the immune patient response. CL begins as an erythematous papule increase in size produced a nodule, eventually ulcerates and crusts over. The border is raised and distinct. The ulcer is painless unless share with bacterial or fungal infection. The sores may change in size and stay over time. The clinical manifestations involve the nose, mouth and pharynx (CDC, 2016)

Cutaneous Leishmaniasis (CL) infect about 12 million people worldwide, with an estimated 1.5 -2 million new cases occurring annually, and it is endemic in 88 countries, Iraq is one of the countries where the disease is widespread with two types of skin leishmaniasis diagnosed, *L. tropica* and *L.* major (Peter, 2004) Hyperendemicity of leishmaniasis in Iraq has made it an important health problem and demanding high annual expenses when it is running in an epidemic state (Hassan, 2015).

The aim of the present study was to find out the rate of Incidence with Cutaneous leishmaniasis in Kirkuk city and know the diseases existence in our city attempt to limit the causes of this incidence.

Materials and methods

Samples collection : This study conducted in Kirkuk province, which is far from the capital Baghdad (240) kilometers north, with a population of (1,500,000) approximately. The province includes four districts are, Kirkuk, Hawija, Daquq, and Dobbs, It collected (728) samples included (424 male and 304 female) with age range (0-70) year from Kirkuk province randomly for the period from October 2018 to December 2019 during field visits to residents of villages and districts, as well as samples collected from people coming to hospitals, central and community health laboratories.

Collecting information: The information were taken from each individual listed in questionnaire forma: Name, sex, age, address, location of lesions, number of lesions, site of lesions .

Skin Smear: Blood from cutaneous lesion was smeared onto a clean slide, then air dried and fixed with methyl alcohol for 1-2 minutes, after washing with tap water, the slide was stained with Geimsa stain for 30 minutes washed with tap water and air dried. The slides were microscopically examined under oil immersion lens for amastigotes (Colle, 1996).

Statistical analysis

χ^2-test was used to assess relationships between categorical variables. Significance was defined as $P < 0.05$.

Results and Discussion

Cutaneous leishmaniasis is a worldwide public health and a social problem in many developing countries. This study starting from the beginning of October 2018 to the end of December 2019 in Kirkuk city, It has been carried out on 728 patient had Cutaneous leishmaniasis, The study was detected that the CL male infection (58.2%) more than female infection (41.8%), Table- 1

Table 1 : Incidence of Cutaneous leishmaniasis according to sex

Sex	No.	Percentage %
Male	424	58.2
Female	304	41.8
Total	728	100
**Chi-square value= 39.560		** (P<0.05)

The results of this study agree with results found by Mohammed et al. (2016) found males infections cases of CL (50.8%) were more than female infections (49.2%), also the results of this study nearly agree with previous studies, AL-Samarai and AL-Obaidi (2009) in AL-haweja city showed that males of CL patients more than females (57%:43%).

The reason in that infection take out in males more than females, possibly, due to the high incidence of working or sleeping males in open areas (surfaces of houses) with less coverage of body as well as more exposure to infected vectors compared with the females (Arroub *et al*., 2010).

The age of the patients neous leishmaniasis with cuta in this study ranged from less than year to 70 year, The result clarified that the age group 0-10 had the highest infection 342(47%) followed by the age group 11 – 20 represented 172(23.6%) while the lowest infection found in 18 (2.4%)51-60 age group as showed in Table (2) with highly significant differences (P<0.05).

Table 2 : Incidence of Cutaneous leishmaniasis according to age

Age (Year)	No. of patients	Percentage
0-10	342	47.0
11-20	172	23.6
21-30	81	11.1
31-40	50	6.9
41-50	42	5.8
51-60	18	2.4
61-70	23	3.2
Total	728	100
**Chi-square value=92.638		** (P<0.05)

Regarding the age the results of this study tacitly in agreement with Rahi *et al.* (2013) who showed that the highest arte of infections was in age group under 12 years. This may because of the adaptive immunity against the disease in big ages due to the possibility of continuous exposer to the parasite during their life time.

Distribution CL according to the months of the year showed that Winter months were reported higher infection with *Leishmania tropica* than Summer months. The highest percent of collected CL cases for the period (October 2018 to the end of December 2019) were observed in February that was (%18.1) whereas the lowest percent of these cases were observed in July (0.5%) ,Table-3

Table 3 : Incidence of Cutaneous leishmaniasis according to months

	Months	No. of patients	Percentage
2018	October	24	3.3
	November	61	8.4
	December	104	14.2
2019	January	127	17.5
	February	132	18.1
	March	92	12.6
	April	62	8.6
	May	20	2.7
	June	15	2.1
	July	4	0.5
	August	6	0.8
	September	8	1.1
	October	5	0.7
	November	14	1.9
	December	54	7.5
	Total	728	100
**Chi-square value=65.682		** (P<0.05)	

The result of the recent study was nearest of a study in Tikrit/Iraq which reported that the incidence rate of CL was maximized in October, January, and February. It was explained the cause of this incidence as related developments in eggs, adults of sand fly and their distribution with taking the pitting of human in consideration (AL-Obaidi, 2000). Climatic factors as rainfall, winds and temperature may be the most important factors affecting the distribution of sand fly species, Decreasing of CL cases in Summer is due to absent of Sand fly in Summer. No sand flies could be collected in the middle of July and August (Amin, 2010).

We are noticed that the highest cases of CL were concentrated in Hawija district represented (46.2%) of the total cases, after that the high recorded cases of CL were noticed in the Daquq district which was (23.8%) of the total cases, while the center of proviance was recorded the lowest cases of CL which was (14.2%) Table-4.

Table 4: Incidence of *Cutaneous leishmaniasis* in Kirkuk proviance

Regions	No. of patients	Percentage
Kirkuk	104	14.2
Dobbs	115	15.8
Daquq	173	23.8
Haweja	336	46.2
Total	728	100
**Chi-square value=51.795	** (P<0.05)	

This result agree with (AlSamarai,2009) , which reported that the incidence rate of CL was maximized in Alhaweja, Kirkuk. The reason for the high percentage of infection with CL in Hawija district is that this region is from Previously recordedinfested places (Turkan Qasim, 2012) in which all prevalence factors for leishmaniasis are available from rural agricultural areas surrounding, It has sandy soil that provides an ideal environment for the insect.

The number of lesions in CL patients ranged between one to 10 in different body parts. One ulcerated lesion was documented in 392 (53.8 %) of patients , while multiple lesions (2-10) were observed in 336(46.2 %) patient, with significant differences (P<0.05), Table-5.

Table 5 **:** Incidence of Cutaneous leishmaniasis according to number of lesions.

No. of lesion	No. of patients	Percentage
Single lesion	392	53.8
Multi lesion	336	46.2
Total	728	100
**Chi-square value== 8.615	** (P<0.05)	

Fig. 1 : Patient with Single Lesion on Hand in Dobbs district.

Fig. 2 : Patient with Multiple Lesions on Hand in Haweja district.

The infection with Cutaneous leishmaniasis were observed in different parts of the patients body including face, arms, legs, neck and feet, Upper &Lower limbs had the highest percentage 154(21.2%) when compared to other sites of infection, followed by face 141 (19.4%), neck 126(17.3%), with highly significant differences (P<0.05), Table- 6.

Table 6: Incidence rate of Cutaneous leishmaniasis according to the lesion location

Location of lesion	No. of patients	Percentage
Face	141	19.4
Upper limbs	113	15.5
Neck	126	17.3
Upper &Lower limbs	154	21.2
Neck	19	2.6
Neck &Lower limbs	41	5.6
Neck& U pper limbs	84	11.5
Face& Upper limbs	45	6.2
Face& Lower limbs	5	0.7
Total	728	100
**Chi-square value=34.785	** (P<0.05)	

The lesions of CL in normal infection appeared in the arms, legs, faces and ears, showed solid, dry like volcano area in shape and characterized by erythematous papule, with ulcerative border, This result agree with Hassan (2015) in Iraq suggested that the highest rate of lesion was on upper limbs 57% while the lowest rate in the ear 1% but Al-Obaidi *et al.* (2000) don't found that

Diagnosis *Cutaneous leishmaniasis*

Direct Microscopic examination

The direct staining smear consider good first examination to CL, a small amount of blood from lesion was carried and direct smears then staining with Giemsa stain according to Al-Abadi, 2016). The Figure (3) show amastigotes in the microphage.

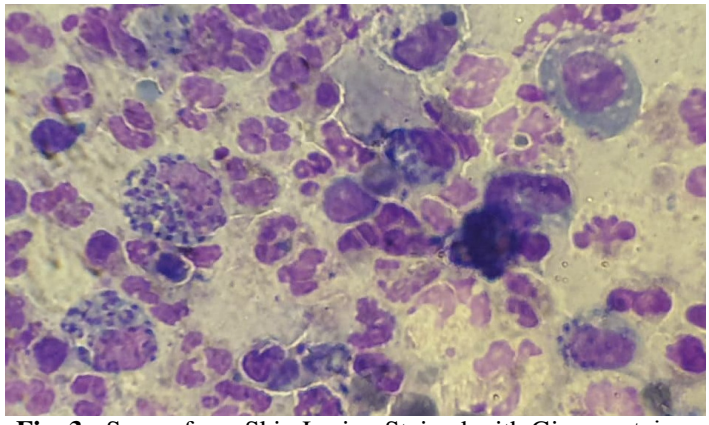

Fig. 3 : Smear from Skin Lesion Stained with Giemsa stain show Amastigotes in WBC(microphage) under 100X.

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