

Epidemiological Study on Baghdad Boil in AL-Zab District in Kirkuk City

M. Sc. Nour Khalaf AL-Shanen

Directorate General of Education in Kirkuk, Kirkuk, Iraq

Email: noor9khalaf7@gmail.com, nk.biologist79@gmail.com

Abstract : Leishmaniasis is one of the diseases of concern in developing countries, and the types of Leishmania and their prevalence rates vary from one region to another. In this study, a total of 320 cases of cutaneous leishmaniasis were evaluated from health centers and public clinics in Al-Zab District during the period from August 2022 until the end of March 2023. We took smears directly from the lesions, dried them, fixed them, stained them with Giemsa, and then examined them microscopically to detect the amastigote stage of macrophages to detect cutaneous leishmaniasis. In this study, the age group under five years showed the highest infection rate, reaching 56%. Most of the infections were concentrated in the villages of Shamit and Al-Sabbaghiya, at 29% and 26%, respectively, for both sexes. The infections were concentrated in the exposed parts of the body, especially the face, and we attributed this to social and environmental causes. Clinical manifestations were common, with dry ulcers occurring in 65%.

Keywords: Leishmaniasis, Baghdad Boil, Epidemiology, AL-Zab.

1. Introduction

Baghdad boil, Delhi pill or Aleppo pill according to the local name is cutaneous leishmaniasis, which has been a constant threat to the population of many parts of Iraq for decades. This disease, which is transmitted through sand fly bites, leaves permanent scars on the bodies of those infected for life, Leishmaniasis is one of the endemic diseases in Iraq (Al-Hamash and Sadiq ,2012) (Saporito *et al.*, 2013) The first person to attribute the cause of this disease to a parasite *Leishmania tropica* (Wright ,1903) The first person to identify this parasite in a number of skin ulcers in Baghdad was Wenyon in 1911 , More than 20 types of text were found Cutaneous, Diffuse Cutaneous , Mucocutaneous and Visceral . (Marquardt *et al.*, 2000) This disease is caused by a protozoan parasite belonging to the genus *Leishmania*, which in turn belongs to the order Kinetoplastia and belonging to a family Trypanosomatid (Manshad, and Abd Al-Kazim,. 2016) . The primary mode of transmission is through the bite of a sand fly (Phlebotomus fly) The parasite has two stages in its life cycle, promastigotes (motile extracellular form) in the sand fly intestine and amastigotes (non-motile intracellular form) in human macrophages and reticulocytes. -Endothelial systems (Ready, P.D. 2013) (Murray *et al.*, 2005) . Cutaneous leishmaniasis is the most common form, resulting in dry or moist ulcers on the skin, which may heal after a period of time, leaving a scar (Alvar *et al.*, 2012). The incidence of visceral leishmaniasis was very low (2.7%) compared to cutaneous leishmaniasis (64.6%). In Kirkuk city, CL is more prevalent than VL. (Obaid and Shareef, 2018) A number of studies on CL and VL have been performed in Iraq, in Hawija District, Kirkuk, on 23,778 people, 107 of whom were positive for cutaneous leishmaniasis, with an incidence rate of 45 cases per 10,000 (AlSamarai and AlObaidi , 2009). The continued presence of the disease and its continuous increase in the region is attributed to the deterioration of health conditions and the limited efforts made to control the vectors of the disease, as well as the reduced use of pesticides to eliminate these vectors. The current study aims to know the relationship between infection with cutaneous leishmaniasis and determine the incidence of infection according to gender, age group, and geographical distribution in the Zab region and over the different months of the year, as well as knowing the number of ulcers, the type of ulcer, its shape, its dimensions, and the location of the ulcer in the affected person.

2. Materials and methods

Data collection: 320 cases were studied who visited health centers in Al-Zab and comprehensive clinics from the beginning of August 2022 until the end of March 2023. Personal information was obtained for each case, which included: the age and gender of the injured person. The places the infected person visited, the type and location of the injury. All studied cases were examined by taking a swab from the edge of the lesion, staining it with Giemsa, and examining it under a microscope using a 100× magnifying glass to detect non-flagellate parasitic elements (amastigotes). Parasitic samples were isolated and cultured from the studied cases, and all of

them were positive by direct microscopic examination by taking a swab from the edge of the lesion using a sterile glass pipette and placing it on a N.N.N. Mediation. It is a two-phase mixture consisting of salted agar, defibrillated rabbit blood, and antibiotics. The farms were monitored daily to look for flagellate parasitic elements (promastigotes).

3. Results and Discussion

Cutaneous leishmaniasis is a disease widespread in Kirkuk in particular, Iraq and the world in general . It is a social problem in developing countries. The study began from the beginning of August 2022 until its completion in March 2023 in the Al-Zab area of Kirkuk , The study included 320 patients with cutaneous leishmaniasis , It was found that males are more affected by CL (58.8%) compared to females (41.2%) , (Figure_1) (Table- 1)(Table-2) . It turns out that the infection rate is higher in males than in females . The results of this study are almost consistent with previous studies by ALSamarai and AL-Obaidi (2009) in the city of Hawija that males are more CL patients than females (57%: 43%). The reason for this is that the infection affects males more than females. This may be due to the higher incidence of work or males sleeping in open areas (rooftops) with less body coverage, in addition to increased exposure to infected vectors compared to females (Arroub *et al.*, 2010).

This may mean that males are more in contact with the external environment, and therefore more vulnerable to insect bites and infection. This is based on society’s customs, with males being outside the home more than females at all ages In addition to social customs and traditions, male body parts are more vulnerable to insect bites, as they are exposed compared to females (El-Safi and Peters , 1991).

Figure_1.

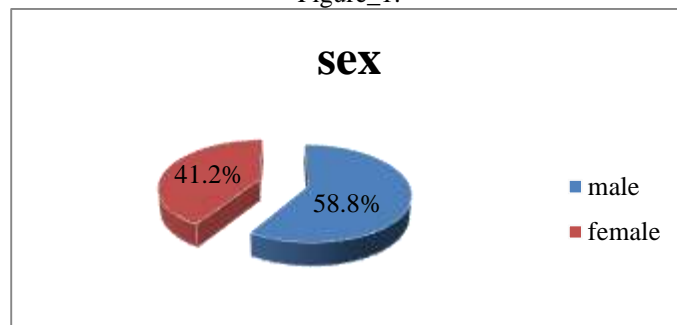


Table-1

Sex	Number	Percentage%
Male	188	58.8%
Female	132	41.2%
Sum.	320	100%

Chi-square value (X²)=9.890 * (P<0.05) Tabulated X²=3.84

We chose to start the study from the beginning of August 2022 until the end of March 2023, in the months when the weather is moderate and cool (Table-2). This is based on previous studies that showed an increase in infection cases in temperate and cold climates including: Manshad & Abd Al-Kazim in 2016, Obaid & Shareef in 2018, Taher & Mahmood in 2020, etc. In the current study, it was noted that infection rates increased in November by (56%). December (11%) and February (14%) compared to the rest of the months of the year, we attributed the reason to the increased activity of the vector (sand fly) during this season every year.

Table-2

	Month	Male		Female		Sum.	
		Number	%	Number	%	Number	%
2022	August	1	100%	0	0%	1	0,3%
	September	29	83%	6	17%	35	11%
	October	12	86%	2	14%	14	4,4%
	November	105	59%	74	41%	179	56%
	December	21	60%	14	40%	35	11%

2023	January	7	64%	4	36%	11	3,3%
	February	15	33,3%	30	66,6%	45	14%
	March	3	60%	2	40%	5	2%
	Sum.	188		132		320	
Chi-square value (X^2) 7=23.06 (P<0.05) (Tabulated X^2 = 14.07)(

The age group less than five years showed the highest infection rate, which was 56%, followed by the age group 6-15 years and 16-25 years, with rates of 12% and 15%, respectively and in agreement with (A.Qader *et al.*,2009a) ,(Turkan ,2012) and (Obaid and Shareef ,2018) It is clear from (Table- 3)(Figure_ 2) that children are more susceptible to cutaneous leishmaniasis compared to adults. This may be due to the child's lack of awareness of the insect bite, as well as the weakness of the immune system in children compared to adults, as well as the difference in behavior and movement during sleep in children. Therefore, their infection rates increase in places where it is endemic Parasite.

Table-3

Age Years)(Male		Female		Sum.	
	Number	%	Number	%	Number	%
0-5	99	54,3%	83	45,6%	182	57%
6-15	27	68%	13	33%	40	13%
16-25	17	35,4%	31	64,6%	48	15%
26-35	26	93%	2	7%	28	9%
36-45	19	100%	0	0%	19	6%
46-55	0	0%	3	100%	3	1%
Sum.	188		132		320	
Chi-square value (X^2) 5=44.37 (P<0.05) (Tabulated X^2 = 11.07)						

The study showed that the location of the injury was on the body in visible places, and most of the injuries were in the face (Figure_ 2), at a rate of 43% for males and 63% for females. The study agreed with (Baraa, 2014), which recorded the highest rate of injuries in the upper parts at 53.8%, then the rest of the body . Single lesions appeared at higher rates than multiple lesions. According to (Table 4).

Figure_ 2 of a one-year-old girls with a facial ulcer

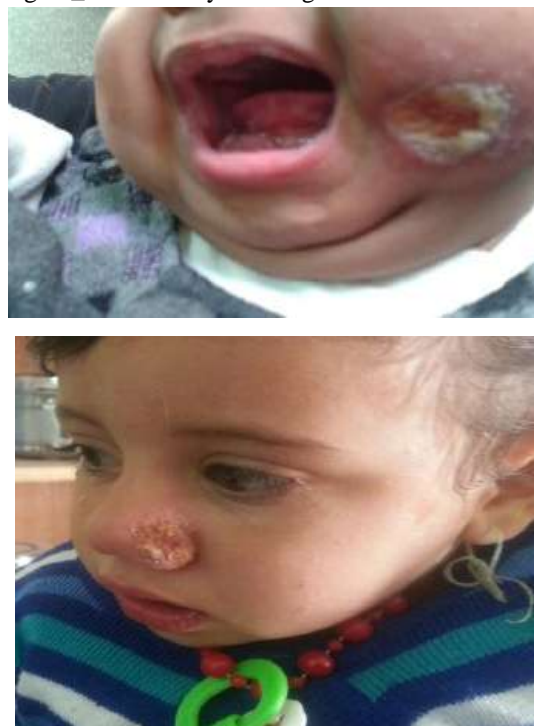


Table- 4

Location of lesion	Male						Female					
	Single lesion	%	Multi lesion	%	Sum.	%	Single lesion	%	Multi lesion	%	Sum.	%
Face	70	88%	10	13%	80	43%	63	76%	20	24%	83	63%
Upper limbs	41	67%	20	33%	61	32%	27	90%	3	10%	30	23%
Lower limbs	30	64%	17	36%	47	25%	14	74%	5	26%	19	14%
Sum.	141	74%	47	25%	188		104	79%	28	21%	132	

)Tabulated $X^2= 5.99$ (Chi-square value (X^2) $2=13.1$ ** ($P<0.05$

The most common event during the study was a single ulcer, and the most common cases were dry ulcers (65%) and wet ulcers (35%). Note the difference between males and females according to (Table 5) It is clear here that the dry ulcer is dominant over the wet ulcer, and this is consistent with Al-Nassiri and Al-Alousy (2011) and Manshad and Abd Al-Kazim (2016) The reason for the increased incidence of dry ulcers over wet ulcers may be the possibility of the spread of *L. tropical* to *L. major* , the reason for the dominance of the dry type over the wet type may be due to the clinical manifestations of the disease affected by the climate in the region, or clinical variations may sometimes reflect the changing resistance of the host and And as Kadir (1988) explained may be due to early diagnosis of the infection since its onset before it develops and turns into the wet form.

Table- 5

type of lesion	Male		Female		Sum.	
	Number	%	Number	%	Number	%
Moist	79	71%	33	29%	112	35%
Dry	109	52%	99	48%	208	65%
Sum.	188		132		320	

)Tabulated $X^2= 3.84$ (Chi-square value (X^2) $1=10.17$ * ($P<0.05$

We based our study on cases of infection in the villages of Al-Zab district in the Kirkuk city, which amounted to 320 cases. The highest rates of infection appeared in the Shamit, 29%, Al-Sabbaghiya, 26%, and Al-Zraria, 18%. Note (Table 6) the reason for the high infection rate in Shamit may be due to the fact that this village is located directly on the banks of the Zab River, where all the factors for the spread of leishmaniasis are available from rural agricultural areas surrounded by sandy lands, which provide an ideal environment for the transmitting insect. When comparing the numbers of cases infected with leishmaniasis in Al-Zab District with the numbers of cases in other locations in Kirkuk Governorate, it was noted that they are close to what was recorded in the Hawija 20.2% (Hassan, 2015), Tobzawa 26.8% of (Obaid and Shareef ,2018) and Daquq 23.8% and Dobbs 15.8% in (Taher and Mahmood 2020), far from infected conditions, as they are rural areas where pet farming is active. In addition to the social and environmental conditions in those areas, which affect the infection rate between males and females (James, 2000).

Table- 6

Regions	Male		Female		Sum.	
	number	%	number	%	number	%
Shamit	64	70%	28	30%	92	29%
Al-Sabbaghiya	52	62%	32	38%	84	26%
Sharia	14	41%	20	59%	34	11%
Al-Numaisa	22	54%	19	46%	41	13%
Zraria	30	53%	27	47%	57	18%
Asbih	3	60%	2	40%	5	2%
Addis	2	33%	4	66%	6	2%

Atira	1	100%	0	0%	1	0,3%
Sum.	188		132		320	
Chi-square value (X^2) 7=12.68 (P<0.05) (Tabulated $X^2= 14.07$)(

References

[1] Murray, H.W., Berman, J.D., Davies, C.R. and Saravia, N.G. 2005. Advances in leishmaniasis. Lancet. 366: 1561–1577.

[2] Ready, P.D. 2013. Biology of phlebotomine sand flies as vectors of disease agents. Annu Rev Entomol. 58: 227–250.

[3] Alvar, J., Velez, I.D., Bern, C., Herrero, M., Desjeux, P., et al. 2012. Leishmaniasis worldwide and global estimates of its incidence. PLoS ONE. 7: e35671.

[4] AlSamarai, A.M. and AlObaidi, H.S. 2009. Cutaneous leishmaniasis in Iraq. J Infect Developing Countries. 3(2): 123-129

[5] Al- Hamash and Sadiq M.,) 2012. (Study of visceral leishmaniasis (kala-azar) in children of Iraq Department of Pediatrics, College of Medicine, Al-Mustansiriya University, Baghdad, Iraq.p (112).

[6] Saporito, L.; Giovanni, M.G.; Simona, D.G. and Claudia, C. (2013). Visceral leishmaniasis: host–parasite interactions and clinical presentation in the immunocompetent and in the immunocompromised host, International Journal of Infectious Diseases 17: 572–576.

[7] Marquardt, W. C.; Demaree, R. S. and Grieve, R. B. (2000). Leishmania and Leishmaniasis. In:Parasitology and Vector Biology. Academic press. London: 57-70.

[8] Manshad, F.A. and Abd Al-Kazim, N.A. (2016). Epidemiological study on Cutaneous Leishmaniasis in infected persons in Thi- Qar governorate. Journal of College of Education for pure sciences (JCEPS). 6(1).

[9] Ready, P.D. 2013. Biology of phlebotomine sand flies as vectors of disease agents. Annu Rev Entomol. 58: 227–250.

[10] Murray, H.W., Berman, J.D., Davies, C.R. and Saravia, N.G. 2005. Advances in leishmaniasis. Lancet. 366: 1561–1577.

[11] Hiro M. Obaid, Hager A. Shareef, (2018). Epidemiological and clinical study of leishmaniasis in Kirkuk city, Iraq. Iraqi Journal of Science Vol. 59, No.3A, pp: 1195-1204.

[12] AlSamarai, A.M. and AlObaidi, H.S. 2009. Cutaneous leishmaniasis in Iraq. J Infect Developing Countries. 3(2): 123-129.

[13] A.Qader, M. Abood and T .Bakir. (2009a). Identification of leishmania parasites in clinical smples obtained from cutaneous leishmaniasis patients using PCR technicque in Iraq. Iraqi J,Sci., 50, 32-36.

[14] Turkan, Q.N. and Qar, Y. (2012). Efficiency study of some laboratory methods used in diagnosing among the injured in the city of Kirkuk, Master Thesis, Quantity of Commons, University of Kirkuk.

[15] Baraa, A. H. (2014) .Detection of cutaneous leishmaniasis using Real-Time PCR in Wasit provice-Iraq.109:42-56.

[16] James, Chin. (2000). Control of communicable disease manual Washington American Public Health Association7 th. 284-289.

[17] El-Safi, S.H. and Peters, W. (1991). Studies on the Leishmaniasis in the Sudan. Epidemic of cutaneous Leishmaniasis in Khartoum. Trop. Med. Hyg., 85 (1): 44 – 47.

[18] Arroub, H.; Alaoui, A. and Habbari K. (2010). Eco- Epidemiologique la Leishmaniose Cutanée dans la Région de Foug Jamâa (Azilal, Maroc). Rabat, Maroco: Le Premier Colloque International sur les Changements Climatiques ET Environnement, Faculté. Des. Sciences.

[19] Al-Samarai A.M. and Al-Obaidi H.S. (2009). *Cutaneous leishmaniasis* in Iraq. J. Infect. Developing Countries 3(2): 123-129.

[20] Kadir, M. A. (1988). A study on cutaneous leishmaniasis in Arbil. Bull. End. Dis., 29:51-56.