

# Epidemiological and Pathological Study of Cutaneous Leishmaniasis in Hilla and Diwanya / Iraq

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## Abstract

Cutaneous Leishmaniasis is an endemic disease in the middle and south of Iraq. Distribution of infection was studied in two governorates (Diwanya and Hilla), Total number of patients attended to the dermatology center in three months ( December 2016 , January, February 2017) in Diwanya was 1940 , 132 were cutaneous leishmaniasis ( 10.7% ) while in Hilla 1757 patients were attended to the dermatology center at the same months, cutaneous leishmaniasis cases were 42 (2.4%). Total number of cutaneous leishmaniasis was 208, 132 for Diwanya 76% while for Hilla was 42, 24%. Infected males were higher than females in both cities 74.3% , 25.7 % respectively. Age variations reveal all infected cases were in all ages but high percent were in age of ten years old and below 35.6 %. No cases were recorded during summer months and the peak of this disease was in January 28.5% , February 30.9%.

Pathological lesions were classified grossly as follows, Papule (redness and swelling). Pustule (redness with crusts sometimes with pus), Ulcer (It was no crusts with shallow ulceration, Irregular margin), Scar formation. Hematological study revealed increase in number of erythrocytes and variation in size ( Poikilocytosis ). Treatment were mostly, Systemic Injection with topical treatment, several types of ointment.

## Introduction:

At the beginning must be not forget the pioneers who discovered Leishmania , Sir William Boog Leishman 1900 , then Charles Donovan who discovered Leishmania donovani in Madras , India ( Dutta A.K. 2008).

Cutaneous Leishmaniasis is endemic disease in Iraq especially (In middle and south), this disease is caused by protozoal parasites called Leishmania tropica (L. tropica), which is produce cutaneous ulcers known as oriental sore , Delhi boil or Baghdad boil. L. tropica transmitted by sand fly (Phlebotomus sergenti and Phlebotomus papatasi ) ( Desjeux, P. 2001 , Gerald D. Schmidt and Larry S. Roberts 2006 ).

There are some reservoir hosts for L. tropica, dogs, rodents foxes and gerbil, while human is the final host, L. tropica have two stages, promastigote which is elliptical in shape have flagellum and found in sand fly and culture. Second stage is the Amastigote , circular or oval in shape found in human and reservoir hosts ( Taylor, M. A. et al 2010). Lira, R. et al (1998) were done a models of cutaneous and visceral disease by isolated metacyclic promastigotes.

L. tropica divided to two subspecies (L. tropica major and L. tropica minor) depend on pathological lesions and immunologically, there are some differences in antigenicity and antibody production. BALB/c mice can be protected against fatal L. major infection by immunization with soluble subfraction (Scott, P. et al 1988 , Ismaix , A. et al 1999).

Incubation period extends from few days till several months, first lesion of infection is a small red papule at the site of the bite of sand fly, it may disappear within weeks (Gerald D. and Larry S. 2006 ).

This disease is endemic in the tropic and subtropic countries, around Mediterranean basin from Greece eastern words as far north as Serbia and Romania, through Turkey, the Middle East and middle of Asia to Afghanistan, Pakistan and India. And whole north Africa (Neoumin , N. 1996 , WHO, 2007). Jaffe , L. et al ( 2014 ) Studied leishmaniasis in Israel and the Palestinian Authority.

Bowman, W. and Rand, M. (1988). Wrote on treatment of cutaneous leishmaniasis, while Alireza K. M. et al (2007) work on treatment of acute Old World cutaneous leishmaniasis, a systematic review of the randomized trials.

Moreno, J. and Alvaro, J. (2002). Worked on epidemiology of canine leishmaniasis, its infection characterized by shallow skin ulcer often on lips or eyelids.

Some research works were very specific on *L. tropica* to identifying it by DNA probe and all genetic information was in DNA of kinetoplast not in ordinary nucleus (Massamba, N. and Mutinga, J. 1992).

This study was performed to assess the distribution, in two governorates (Hilla and Diwanya), pathological changes, efficacy of different therapeutic and treatments.

### Materials and Methods:

Weekly visiting dermatology centers of both Governorates Hilla and Diwanya, recording documented cases and following the present cases, diagnosis, clinical signs, symptoms, treatment, with general information about age, sex, location of lesions (face, hands, legs, body) of patients were recorded, where are they live rural or urban areas.

Forty two cases were recorded in Hilla (from 14 January till 31 of December), while 132 patients were recorded in Diwanya at the same period. Three months choose (December 2016, January and February 2017) to know total number of patients attended to dermatology centers, for Hilla 1757 patients while for Diwanya 1940 patients

### Results: Distribution:

The present data revealed, still cutaneous leishmaniasis is. Endemic disease, because these data only for two hospitals. Total number for three months (Peak of infection, December, January and February) was 176 cases attended to the dermal centers of both governorate, 132 cases for Diwanya and 44 cases were in Hilla, 132 cases out of 1940 cases Dermatological attended to hospital of Diwanya (10.7%), while for Hilla 42 cases out of 1757 cases of dermatology (4.2%).

There are some variations in distribution of cases on months of the year, No cases were recorded in the following months (May, June, July, August) in both cities (Table, 1) while cases of cutaneous leishmaniasis were recorded in the rest months of the year, but the highest was February in Hilla (30.9%), in Diwanya was January (28.7%). Fig. 7.

Age variations were documented in table two, so the highest percent of cutaneous leishmaniasis was in ages of ten years old and below (36.6%), while the lowest percent was in ages over 50 years old (0.75%) Table (2).

Table (1) show data (number and percent) of infection (Cutaneous Leishmaniasis.) in both cities.

Months	Jan.		Feb.		Mar.		Apr.		May-Aug.		Sep.		Oct.		Nov.		Dec.		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%	No	%		
Hilla	12	28.5	13	30.9	4	9.5	1	2.3	0	0	1	2.3	1	2.3	3	7.5	7	16.6	42	100
Diwanya	38	28.7	35	26.5	10	7.5	8	6	0	0	1	0.8	3	2.2	15	11.3	22	17.8	132	100
Total	50	287	48	27.5	14	8	9	5.1	0	0	2	1.1	4	2.2	18	10.3	29	16.6	174	100

Table (2) presentation of number and percent of cases for all ages of patients in Diwanya

Age	No.	%
10 years and below	47	35.6
11-20	33	25

21-30	25	18.9
31-40	18	13.6
41-50	8	6.15
51-60	1	0.75
Total	132	100

Pathogenesis: Lesions of this disease were varied from small cutaneous nodules to gross mucosal tissue destruction. Most lesions were present on exposed parts of the body (face, hands, and legs), not covered by clothes. The first lesion of this disease is a small red papule at the site of the insect bite (Fig. 1,2). This lesion may disappear for few weeks and then develops to white crusts, sometimes mixed with pus and black center, this lesion surrounded by red line which is indicate the reaction of parasite with living tissue, this lesion called pustule (second stage of lesions), (Fig.3,4,5,6). Third stage of cutaneous leishmaniasis is the ulcer. After fallen white crusts of pustules, leave lesion characterized by shallow ulcer, pink in color (Fig. 7, 8). This ulcer developed to scar formation which stay for ages. Sometimes more than one lesion at the same person and several stages of pathogenesis (Fig. 2, 6, 7) *Leishmania recidivans* not noticed in these cases.

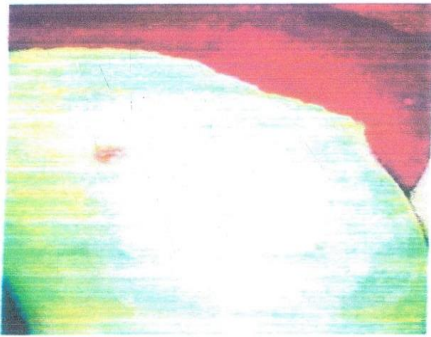


Fig (1): Lesion papule on the arm of boy.

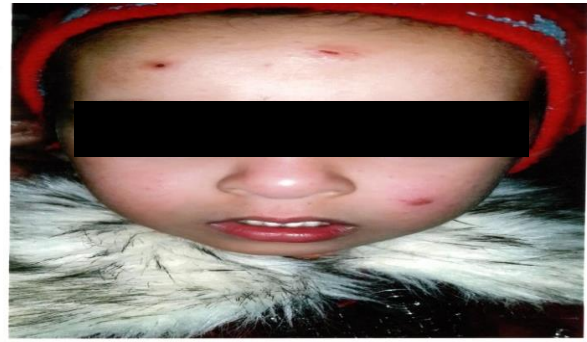


Fig ( 2 ): Lesion of papule the face of child



Fig. (3) Pustule on the leg of man, black spot in the center, white crusts surrounded by red line.



Fig.(4) Pustule on the forehead of boy.



Fig. (5) Three lesions pustule on the face of boy, white crusts.



Fig.(6) Two lesions on the face of girl pustule with pus.

**Fig.(7) Three Lesions on the Face of boy Papule(upper) Pustule(middle) Ulcer(lower)**



Fig.(8): Ulcer and scar on the upper part of nose.

**Hematology:**

Blood pictures were done for some patients. The results show increase number of erythrocytes in acute cases (6.21 -6.96 X 10) in comparison with normal (control) not more than (4.69 X 10) as well as mean corpuscular volume (MCV) for erythrocytes in acute patients was less than normal, ranged from 63 - 74 fL while in control (normal) ranged from 81 - 96 fL, variation in size of erythrocytes were present called piokilocytosis (Fig. 8).

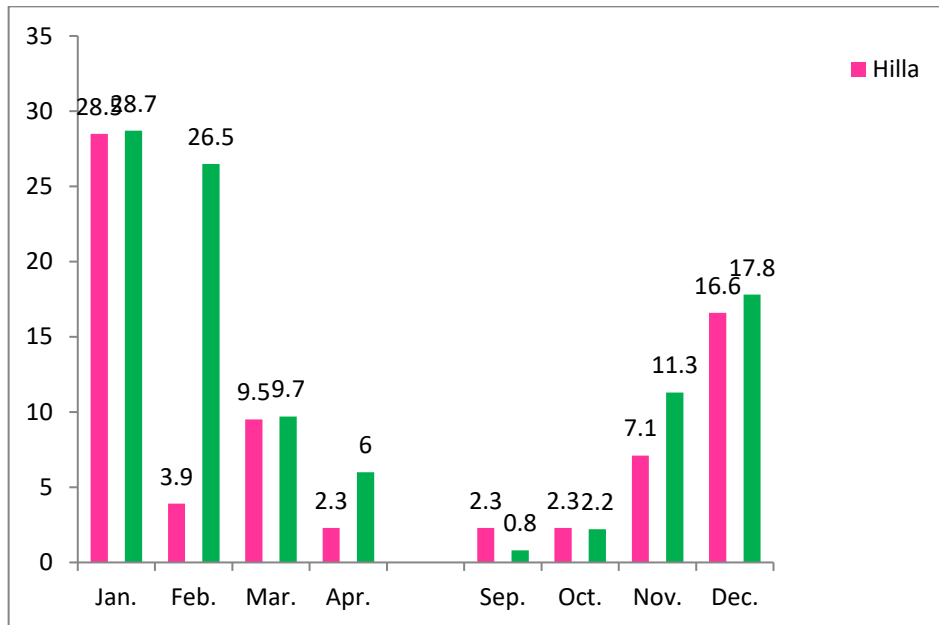


Fig (6) Comparison of the percent of infection in months of the year (2016)

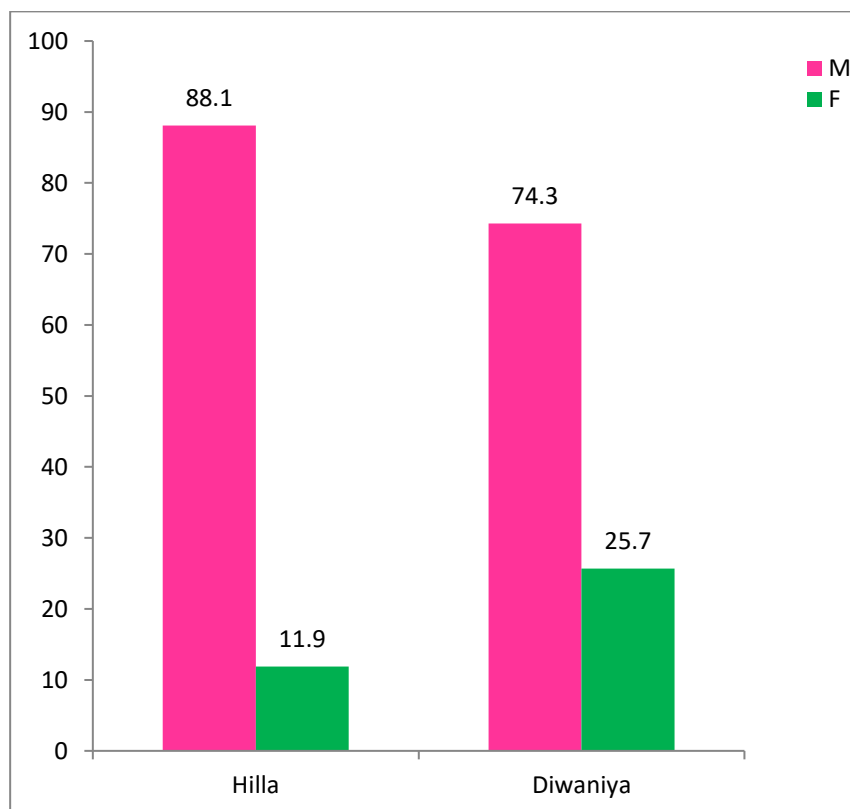


Fig (7) Comparison of Results between (M) infections and females (F) as well as between Hilla and Diwaniya.

#### Treatment:

**Local treatment:** which was include physical methods, such as surgical excision sometimes (suitable only for small facial lesions to clean pus if present), curettage under local anaesthetic permits healing in 3-6 weeks, according to the size of the sore. Heating to 39-41 C kills dermatropic species Leishmania and maximizes the efficiency of lymphocytes and macrophages, thus accelerating natural healing. Methods of heating was done by suitable plastic sac containing hot water or thermostatically controlled pads.

**Chemical methods:** Aminosidine ointment (15 % with 15% urea in white soft paraffin). Careful infiltration of sodium stibogluconate or meglumine antimoniate into the edge and base of lesion.

**Systemic treatment:** Antimonial (Pentostam) was remain the most useful and available.

### Discussion:

**Distribution :** These results of cutaneous leishmaniasis were depend on , what recorded in two hospitals (one for each governorate ) 1757 for Hila and 1940 for Diwanyia, so this disease is endemic and This indicate all hosts of life cycle is present ( sand fly, dogs, rodents jackles and human). From September till November , sand fly become active and live indoor , so these months consider the beginning of infection , therefore infection concentrated in December, January, February and not recorded during summer months.

**Pathogenesis :** All pathologic lesions of cutaneous leishmaniasis were noticed in different stages , papule, pustule, ulcer, and scar but there are variations among patients of Diwanyia and Hilla, because heavy infections in Diwanyia patients, more than one (two, three ) lesion in one patient and sometimes all pathologic stages in one patient , so this indicate more than one bite of sand fly ( recurrent bites ), and weak immunity.

There were age variations in infection of cutaneous leishmaniasis and recurrent infection, this means this disease does not give permanent immunity, but there were differences in percent on infection, it was highest in patients whose age below 10 years old , this is related to immunological factors of these children because maternal immunity declined from the birth day

### Conclusions

1. Cutaneous Leishmaniasis is endemic disease in Hilla and Diwanyia , Higher percent in Diwanyia than Hilla but not serious problem in both governorates, .
2. Distribution of disease in all ages but 10 years old and below were the highest percent.
3. Peak of this disease was in December, January, February, while during summer months (May, June, July, and August) not recorded).
4. Pathological lesions include the following stages (papule, Pustule, Ulcer, Scar).
5. There is no permanent immunity because reinfection occur in the same person.
6. The best treatment was systemic treatment accompanied with local treatment.

### Recommendations

1. This disease need Identification of its DNA by a polymerase chain reaction (PCR).
2. Eradication of sand fly annually in September and October to minimize the number of infection, as well as get rid of stray dogs (must be).
3. Eradication of wild rodents (reservoir hosts) in farms, it is not only problem for cutaneous Leishmaniasis but these animals big problems for poultry farms and agriculture farms.
4. Media and Educational programs about how protect people from this disease and avoid infection.

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