

# Clinical Spectrum of Cutaneous Leishmaniasis in Hail, KSA 2016

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**Abstract:** *Introduction:* Cutaneous leishmaniasis is a major tropical infection of public health importance. It is caused by a group of protozoan intracellular parasites belonging to the order of kinetoplastida. Human CL data collection was based on available records in the dermatology services of Hail General Hospital and King Khalid Hospital from January to December 2016. *Methods:* Diagnosis is confirmed by the microscopic demonstration of Leishmania amastigotes on Giemsa-stained scraping tissue smears. *Results:* A total of 44 Saudi and non- Saudi patients with skin lesion diagnosed as suffering from Cutaneous leishmaniasis were confirmed parasitologically as smear positive for amastigote forms of *L. tropica*. The infected cases of CL appear to be predominant among the Saudi patients 26 cases (59.1%) was more than non-Saudi patients 18 cases (40.9%). *Conclusion:* Cutaneous leishmaniasis in Hail is still considered an endemic disease and two forms of Amastigote found in humans infected With Cutaneous Leishmaniasis in Hail, KSA .

**Keywords:** Cutaneous leishmaniasis, Sandfly, Hail, Saudi Arabi

## 1. Introduction

Cutaneous leishmaniasis is a major tropical infection of public health importance. It is caused by a group of protozoan intracellular parasites belonging to the order of kinetoplastida. The disease is found in over 70 countries and 90% of cases occur in Afghanistan, Algeria, Brazil, Pakistan, Peru, Saudi Arabia and Syria. The disease is endemic in 18 out of 23 Middle Eastern countries [1, 2]. Humans acquire CL infection through a bite of an infected female phlebotomine sand fly. Promastigotes enter the human circulation and are engulfed by macrophages and transform into amastigotes. The change in host temperature and surrounding pH triggers such transformation [3,4].

Cutaneous leishmaniasis (CL) is a protozoan disease transmitted through the bites of infected phlebotomine sandflies and caused by members of Leishmania species. It is the most prevalent clinical form worldwide with an approximative global incidence of about 1.2 million cases per year. About one-third of these cases occurs in each of three epidemiological regions, the Americas, the Mediterranean basin, and western Asia. Kingdom of Saudi Arabia (KSA) is classified as the fourth most endemic focus of CL in the middle East to Central Asia region with an estimated annual incidence ranging from 9 600 to 15.8 cases/year ill. The first CL case in KSA was reported by [7] this date the disease has been reported in different parts of the country and many regions were endemic such as Al Qaseem, Al Madinah Al Munawwarah, Riyadh, Al Hassa and Aseeri [3,4,7]. According to the Ministry Of Health statistical reports, Hail province is reported as the fifth most infected region among other Saudi provinces and cities. Indeed, the average reported incidence of CL in Hail is 44.

The initial lesion appears as a red furuncle-like papule. The papule gradually enlarges in size over a period of several weeks and assumes a more dusky violaceous hue. Eventually the lesion becomes crusted with an underlying shallow ulcer, often having raised and somewhat indurated

borders. The healing is usually with a scar that is typically atrophic, hyperpigmented, and irregular (cribriform). In addition, the classical types may often show a clustering of lesions, skin crease orientation, volcanic nodules, satellite papules, subcutaneous nodules, and iceberg nodules [1,2,5,6].

Houasetal, 2015 reported that Profile and geographical distribution of reported cutaneous leishmaniasis cases in Northwestern Saudi Arabia, from 2010 to 2013 [8].

The aim of the present study is to investigate the cases infected with Cutaneous leishmaniasis in Hail 2016.

## 2. Material and methods

### 1) Study Area

This is an epidemiological investigation of CL in the province of Hail. It is one of the 13 Saudi provinces. It is located in northwestern of KSA. It has a continental desert climate with hot summers (average high temperature 29.2 °C) and cool winters (average low temperature 13.3 °C)

### 2) Study design and data collection

Human CL data collection was based on available records in the dermatology services of only Hail General Hospital over a period from January – December 2016. First-line CL diagnosis was based on the clinical aspect of the lesion. Physician investigates the lesion appearance (mostly a non-healing nodulo-ulcerative lesion with "volcanic crater"), its evolution period (slowly enlarging lesion) and the geographical origin of the patient. Diagnosis is confirmed by the microscopic demonstration of Leishmania amastigotes on Giemsa-stained scraping tissue smears.

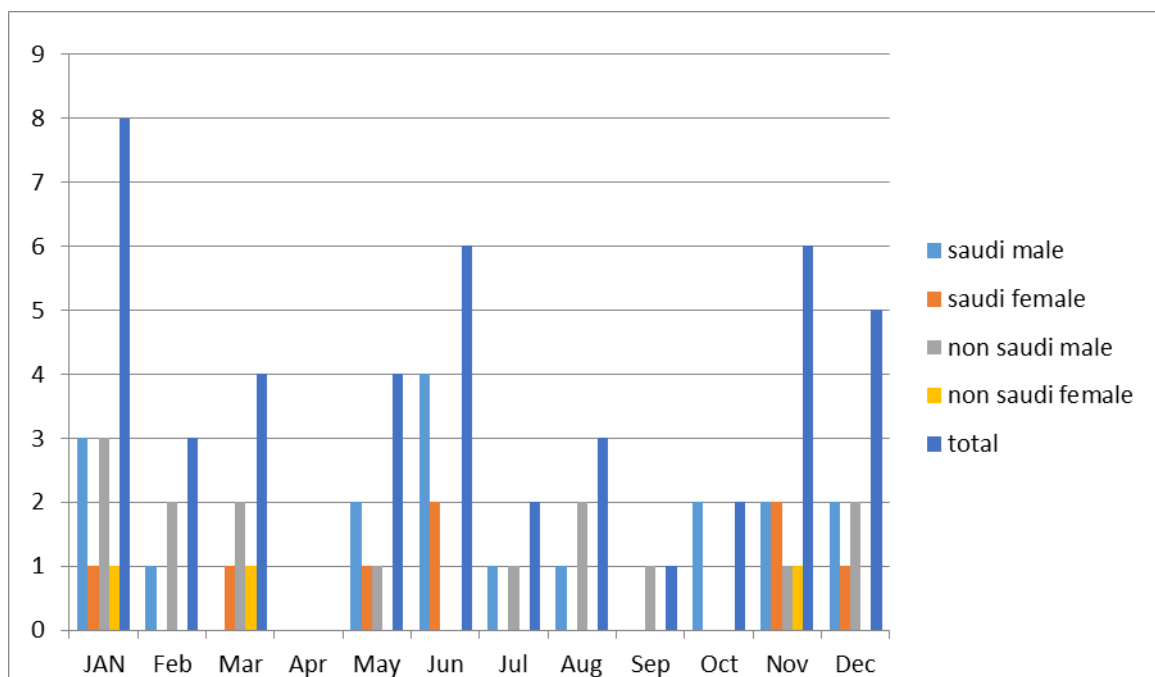
## 3. Results

A total of 44 Saudi and non- Saudi patients with skin lesion diagnosed as suffering from Cutaneous leishmaniasis were confirmed parasitologically as smear positive for amastigote

forms of *L. tropica*. The patients attended the Dermatology clinics at General Hail Hospital, in Hail, KSA from January to November 2016. The infected cases of CL appear to be predominant among the Saudi patients 26 cases (59.1%) was more than non Saudi patients 18 case (40.9%) and For Male 33 cases (75%) more than Female 11 cases (25%).

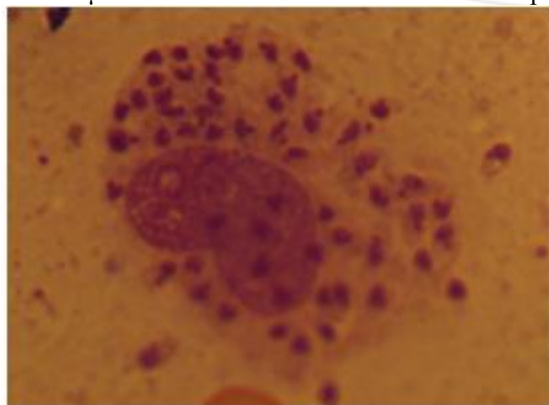
**Table 1:** Monthly Prevalence of Cutaneous Leishmaniasis

Month	Total No. of infections	Saudi		Non- Saudi	
		Male	Female	Male	Female
1-2016, January	8	3	1	3	1
2-2016, February	3	1	0	2	0
3-2016, March	4	0	1	2	1
4-2016, April	0	0	0	0	0
5-2016, May	4	2	1	1	0
6-2016, June	6	4	2	0	0
7-2016, July	2	1	0	1	0
8-2016, August	3	1	0	2	0
9-2016, September	1	0	0	1	0
10-2016, October	2	2	0	0	0
11-2016, November	6	2	2	1	1
12-2016, December	5	2	1	2	0
Total	44	18	8	15	3

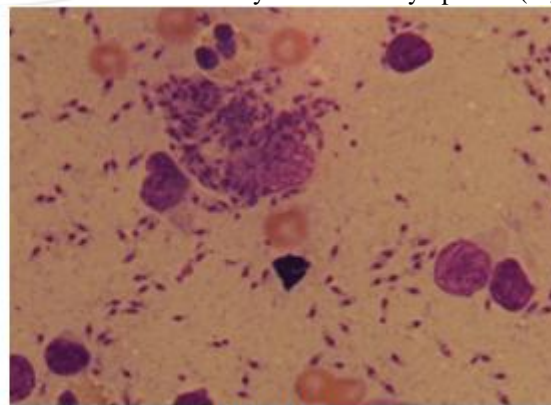


**Parasite morphology:**

Morphologically, there are two developmental stages of the parasite. Amastigotes are small spherical non-flagellated cells measuring from 2-4µm in diameter with a nucleus and kinetoplast that are surrounded by vacuolated cytoplasm. (Fig.1



**Figure 1A**



**Figure 1B**

**Figure 1a** Amastigote ( Round form ) inside the macrophage  
**Figure 1B** Promastigote like form ( spindle shape ) outside the macrophage .



**Figure 2a**



**Figure 2b**

Figure 2a. Initial furunculoid lesion of cutaneous leishmaniasis  
Figure 2b. Acute, wet type of cutaneous leishmaniasis



**Figure 3a**



**Figure 3b**

Figure 3a. An infiltrated plaque with central crust and underlying ulcer  
Figure 3b. Large erythematous scaly and crusted plaque with central ulceration.

#### 4. Discussion

A large set of data is available concerning the epidemiological feature of this disease in some foci of the country such as Al Madinah Al Munawarah, Al Baha, Al Hassa and Al Qassim provinces. These data concern the identification of the causative *Leishmania* species, the clinical feature as well as the analysis of the phlebotomine sand flies fauna in these regions [9,10,11,12,13]. Despite all these studies, some Saudi foci are still not investigated and no reports about the epidemiological feature of CL are available until now. Among these foci is the Hail Province in Northwestern Saudi Arabia.

Concerning the nationality of the patients, Saudi patients are affected with CL more than non-Saudi. This is an expected result since Saudi people go to the desert more than non-Saudi which makes them more susceptible for sand flies.

However, it is important to highlight that 45.6% of the non-Saudi patients are teenagers and adults (more than 15 years old). This must be the direct consequence of the composition of this population since foreign workers are mainly composed by adults. Most physicians indicated that more than half of their patients had between 2 and 10 lesions. These results coincided with previous studies, which acknowledge that the majority of the CL patients had more than one lesion [12,18] and was different from others [19] who indicated that the majority of their patients (71%) had a single lesion. This difference could be attributed to the nationality of these patients. Saudis tend to have a single, mild lesion that usually heals spontaneously after 3-4 months giving a long-lasting immunity in most cases. These patients are usually of a young age (<10 years old). Non-Saudis have a more aggressive form of the disease, with numerous lesions that are difficult to treat [12] and creating a "lifelong aesthetic stigma."

Different parts of the country and many regions were endemic such as Al Qaseem, Al Madinah Al Munawwarah, Riyadh, Al Hassa and Aseer[7]. According to the Ministry Of Health statistical reports, Hail province is reported as the fifth most infected region among other Saudi provinces and cities. Indeed, the average reported incidence of CL in Hail is 44 in 2016.

Houasetal, 2015 reported that Profile and geographical distribution of reported cutaneous leishmaniasis cases in Northwestern Saudi Arabia, from 2010 to 2013 [8].

Two forms of Amastigote Found in Humans Infected With Cutaneous Leishmaniasis in Hail, KSA and this work agree with the work of [14] and [8].

Concerning with the clinical spectrum of cutaneous leishmaniasis in Hail, KSA 2015 we found that: Initial furunculoid lesion of cutaneous leishmaniasis and acute type of cutaneous leishmaniasis and this agree with the work of Arfanet.al 2015 [15]. The initial lesion appears as a red furuncle-like papule. The papule gradually enlarges in size over a period of several weeks and assumes a more dusky violaceous hue. Eventually the lesion becomes crusted with an underlying shallow ulcer, often having raised and somewhat indurated borders. The healing is usually with a scar that is typically atrophic, hyperpigmented, and irregular (cribriform). In addition, the classical types may often show a clustering of lesions, skin crease orientation, volcanic nodules, satellite papules, subcutaneous nodules, and iceberg nodules [1, 2, 5, 6].

The clinical manifestations of leishmaniasis depend on the interaction between the characteristic virulence of the species and the host's immune response (2). These are transmitted by the bites of female sandflies of the genus *Phlebotomonas* in the Old World and *Lutzomyia* in the New World.

More than 20 species of *Leishmania*, pathogenic for humans and other mammals, have been identified worldwide (3). About 30 species of sandflies are proven vectors; the usual reservoir hosts include humans and domestic/wild animals. The clinical manifestations of leishmaniasis depend on the interaction between the characteristic virulence of the species and the host's immune response (2). These are transmitted by the bites of female sandflies of the genus *Phlebotomonas* in the Old World and *Lutzomyia* in the New World. More than 20 species of *Leishmania*, pathogenic for humans and other mammals, have been identified worldwide (3). About 30 species of sandflies are proven vectors; the usual reservoir hosts include humans and domestic/wild animals.

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## 5. Conclusion

Cutaneous leishmaniasis in Hail is still considered an endemic disease in even though its incidence is declining. More studies are required to support epidemiology in the country and more effort should be made for the treatment and prevention of the disease and reduce its incidence and prevalence.

## References

- [1] Hepburn NC. Cutaneous leishmaniasis: an overview. *J Postgrad Med* 2003; 49:50-4.
- [2] Markle W, Makhoul K. Cutaneous Leishmaniasis: Recognition and Treatment. *American Family Physician* 2004; 69: 6. 1455-60.
- [3] Zakai, H.A., Chance, M.L. and Bates, P.A. (1998). In vitro stimulation of metacyclogenesis in *Leishmaniabraziliensis*, *L. donovani*, *L. major* and *L. mexicana*. *Parasitology*; 116: 305-309.
- [4] Zakai, H.A., Chance, M.L. and Bates, P.A. (1999). The axenic cultivation of *Leishmaniadonovani* amastigotes. *Saudi Medical Journal*; 20: 334-340.
- [5] Manzoor A. Cutaneous leishmaniasis. *J Pak Assoc Dermatol* 2005; 15: 161-71.
- [6] Ayub S, Khalid M, Mujtaba G, Bhutta RA. Profile of patients of cutaneous Leishmaniasis from Multan. *J Pak Med Assoc* 2001; 51: 279-81.
- [7] Health Statistical Year Book (2012). Ministry of Health, Saudi Arabia.
- [8] Najoua Haouas, Latifa Remadi, Dhekra Chaara a, Najla Chargui a, Radhia Dabghi b, Henda Jbeniani c, Hamouda Babba a, Christophe Ravel d. Unexpected co-detection of promastigote and amastigote *Leishmania* forms in a human cutaneous lesion: implications for leishmaniasis pathophysiology and treatment. *Elsevier journal*.
- [9] El-Beshbishy HA, Al-li KH, El-Badry AA. Molecular characterization of cutaneous leishmaniasis in Al-Madinah Al-Munawarah province, western Saudi Arabia. *Int J Infect Dis* 2013a; 17(5): e334-e338
- [10] El-Beshbishy HA, Al-Ali KH, El-Badry AA. Molecular characterization of *Leishmania* infection in sand flies

- from Al-madinah. Al-munawarah province, western Saudi Arabia. *ExpParasitol* 2013b; 134(2):211-215
- [11] Shalaby I, Gherbawy Y, Jamjoom M, Banaja AE. Genotypic characterization of cutaneous leishmaniasis at Al Baha and Al Qasim Provinces (Saudi Arabia). *Vector Borne Zoonotic Dis* 2011; 11(7):807-813
- [12] Al-Mohammed HI. Efficacy of two rodenticides against *Leishmania* reservoir host rat (*Psammomysobesus*) in the rural area of Al-Ahsa Oasis, Saudi Arabia. *J Egypt SocParasitol* 2010; 40(3): 609-616
- [13] El-Badry A, Al-Juhani A, Ibrahim el-K, Al-Zubiany S. Distribution of sand flies in El-Nekheil province, in Al-Madinah Al-Munawwarah region, western of Saudi Arabia. *Parasitol Res* 2008; 103(1):151-156.
- [14] Mohammed Daboul 2008 .Is the Amastigote Form of *Leishmania* the Only Form Found in Humans Infected With CutaneousLeishmaniasis?. *LABMEDICINE journal* 2008 , DOI:1309/ 10.
- [15] Clinical spectrum of cutaneous leishmaniasis: An overview from Pakistan, Arfanbari .
- [16] Marsden PD. Mucosal leishmaniasis ("espundia" Escomel, 18 *Trans R Soc Trop Med Hyg* 1986;80:859-76.
- [17] Ridley DS. A histological classification of cutaneous leishmaniasis and its geographical expression. *Trans R Soc Trop Med Hyg.* 1980;74:515–21.

