

# Cutaneous Leishmaniasis: Endemic Regions and Epidemiological Characteristics of Cases Declared at University Hospital Center of Tlemcen, Algeria, 2012-2016

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**Abstract:** Cutaneous leishmaniasis (CL) is a widespread parasitic disease and a public health problem worldwide. It is an endemic and notifiable disease in Algeria. Our objective was to know the epidemiological characteristics and to determine the endemic regions of the CL in the town of Tlemcen. A descriptive study was conducted with a prospective collection over five years, from 2012 to 2016, based on the systematic declaration of CL cases received from the various departments of the University Hospital center (UHC) of Tlemcen. Data entry and analysis was done by Epi-info 6 software. Thirty-four cases of cutaneous leishmaniasis, 27 of which are autochthonous were reported at the UHC of Tlemcen during 5 years with a female predominance; sex ratio (h/f): 0.79. The most affected age group was 40-50 years old. Six cases occurred in children under 16 years, 80% of the reports were received by the dermatology department. The highest peak was recorded in 2013; autumnal predominance was noted in 30% of cases. All patients lived or had been in endemic areas. Vector control campaigns must be reinforced to fight against leishmaniasis in the town of Tlemcen, also, the improvement of habitat conditions for populations at risk.

**Key words:** Cutaneous leishmaniasis, epidemiology, endemic, habitat, Tlemcen.

## 1. Introduction

Leishmaniasis is the group of diseases initiated through the bite of a female phlebotomine sand fly vector [1]. Cutaneous leishmaniasis (CL) is a major problem health, it is serious and disfiguring and it mainly affects poor people. Epidemics can occur anywhere in urban and rural areas, and are sometimes be seen in refugee camps or internally displaced populations [2]. Cutaneous leishmaniasis is endemic in more than 70 countries worldwide, and 90% of cases occur in Afghanistan, Algeria, Brazil, Pakistan,

Peru, Saudi Arabia, and Syria [3].

In Algeria, cutaneous leishmaniasis is a zoonosis that is a major public health problem, with more than 200 cases per 1,000 inhabitants mainly reaching the regions of the steppe and the northern Sahara. Depending on the climatic conditions, the endemic areas move north and have already reached the Tell Atlas [4]. Algeria is considered a country with high-burden of cutaneous leishmaniasis, 5,423 cases are reported in 2014, incidence rate (cases/10,000 inhabitants in endemic areas) was 5.42 and the population at risk represented 26% [1].

Leishmaniasis has become a notifiable disease in Algeria since 1990 and therefore the reporting of all persons with leishmaniasis to the relevant health authorities is a legal requirement.

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*1.1 Epidemiological Situation of Cutaneous Leishmaniasis in Tlemcen (West-Algeria)*

In Tlemcen province, as in Algeria, cutaneous leishmaniasis is one of the most common zoonoses that can only be combated in the context of effective collaboration between all sectors concerned. The epidemiological situation of cutaneous leishmaniasis at the University Hospital of Tlemcen shows that it is a zoonosis with frequent vector among the zoonoses which are ranked 2nd of the notifiable infectious diseases [5]. Cutaneous leishmaniasis represents 90% of vector-borne diseases reported by health departments [6].

The first two autochthonous cases were reported in 1986 in the town of Tlemcen. CL has been extended in Tlemcen and since then, this parasitosis has been added to the map of geographical distribution in Algeria [7].

In eight years, from September 1982 to September 1990, 25 cases of CL were observed in Tlemcen, the first case dates back to 1982. This parasitosis has become more common and most cases were contracted in a supposedly spared area. The majority of cases came from a perimeter centered by Tlemcen. There was no particularity in the distribution by sex; by age or season. The disease had evolved on average a little over 5 months, suggesting that CL was not known to patients and many physicians who had widely used antibiotics and antiseptics [8].

Between October 2005 and January 2006, an epidemic of the CL in 23 patients occurred in a new

region called Magoura, a rural area near the Algerian-Moroccan border, at 100 km from the wilaya of Tlemcen [9].

*1.2 Objective of the Study*

The present study aims to know the epidemiological characteristics and to identify the endemic regions of cutaneous leishmaniasis in the town of Tlemcen.

**2. Materials and Methods**

A descriptive study was conducted with a prospective collection during five years, from 2012 to 2016, based on the systematic declaration of CL cases received from the various departments of the University Hospital center (UHC) of Tlemcen. Data entry and analysis was done by Epi-info 6 software.

**3. Results**

Thirty-four cases of cutaneous leishmaniasis were reported at the UHC of Tlemcen during a period of five years from 2012 to 2016 with a slight female predominance (sex-ratio F/M: 1.27). The average age was 38.4 years with a minimum of one year and maximum of 65 years. The most affected age group was 40-50 years old.

Cutaneous leishmaniasis at the children: six cases of CL were reported at the children below 16 years (17.65%) with an equal distribution according to sex and autumnal predominance (Table 1).

Concerning the reporting department, 80% of CL cases were sent by department of dermatology and 20% of microbiology department of UHC of Tlemcen.

**Table 1 Distribution of cutaneous leishmaniasis cases by sex and age groups in UHC of tlemcen; 2012-2016.**

Age group (years)	< 20		20-44		45-65		> 66		Total		Total general
	M	F	M	F	M	F	M	F	M	F	
Years 2012	0	1	2	0	1	1	0	0	3	2	5
2013	1	2	0	0	2	2	1	3	4	7	11
2014	0	0	0	0	0	3	0	0	0	3	3
2015	1	0	1	0	0	4	0	0	1	5	6
2016	1	0	3	0	2	3	0	0	6	3	9
2012-2016	3	3	7	0	5	13	1	3	15	19	34

**Table 2** Epidemiological and endemic characteristics of cases of cutaneous leishmaniasis declared at UHC of tlemcen; 2012-2016.

	Number of cases	Percent %
<b>Demographic Characteristics</b>		
Sex		
Women	19	55.89
Men	15	44.11
Age ranges (years)		
> 66	03	08.82
45-64	18	52.95
20-44	07	20.58
< 16	06	17.65
<b>Epidemiological Characteristics</b>		
Total of cases (2012-2016)	34	100.00
Epidemic peak (2013)	11	32.35
Epidemic season (Autumn)	10	30.00
<b>Endemic Characteristics</b>		
Concept of habitat or stay in endemic area	34	100.00
Area most affected/Endemic regions	34	100.00
Tlemcen province	27	79.41
Tlemcen	07	
Remchi	04	
Al aricha	03	
Sebra	03	
Maghnia	03	
Sebdou	03	
Nedroma	02	
Ouled El mimoun	02	
Other district	07	20.59
Naama	02	
El Bayadh	02	
Ain Temouchent	02	
Saida	01	

The highest peak was recorded in 2013: 11 cases. Also, preponderance autumnal was noted in 30% of cases. All patients lived or had been in endemic area and seven have been received from other province (Table 2).

## 4. Discussion

### 4.1 Epidemiological Aspects of CL

The epidemiology of leishmaniasis depends on the characteristics of the parasite species, the local ecological characteristics of the transmission sites, the current and past exposure of the human population to the parasite and widely varying human behaviour [10].

#### 4.1.1 Trends of CL over Time

The number of CL cases reported in town of Tlemcen between 2012 and 2016 was 34 cases. The maximum incidence in year 2013 was 11 cases (32.35%), this can be explained either by the occurrence of an epidemic during this year or by a better system of declaration of the disease.

The decreased number in 2014 (three cases), may be due to preventive measures applied following the peak of 2013.

An increasing trend in the number of CL cases was observed in 2015 and 2016 with 06 and 09 cases respectively. For this effect, measures to fight this disease need to be strengthened in Tlemcen.

#### 4.1.2 Distribution of CL by Sex

A female predominance is noted (55.89% for women vs. 44.11% for men; sex-ratio F/M: 1.27). Our result is consistent with many studies; in Algeria (189 men and 197 women; sex ratio F/M: 1.04) [11]. Also in Taza, Morocco which found a slight in the CL prevalence between genders with predominance of CL in females (57 vs. 43% for men; sex-ratio F/M = 1.32) [12] and in another study, 44% male and 56% female patients were affected by CL [13].

In contrary, in another study carried out in Tlemcen on 25 observations, a male predominance was noted in 14 cases against 11 in females (56 % for men vs. 45% for women; sex-ratio F/M: 0.78) [8].

#### 4.1.3 Distribution of CL by Age

About the age, all ages are affected by CL; the average age was 38.4 years with a minimum of one year and maximum of 65 years, this result is coherent to that found in the LC study at Tlemcen, average age was 30 years with a minimum of 02 years and maximum of 82 years [8]. All ages were concerned from infant to the old man, from 1 month to 90 years, children under 5 accounted for 27.4% [11].

The results found in Morocco showed that no age group was spared from leishmaniasis [12], in another study patients' ages varied from 1.25 to 70 years [13].

#### 4.1.4 Cutaneous Leishmaniasis in Children

In our series, the CL was registered in six children under 16 years, with an equal gender distribution and autumn preponderance.

A retrospective study carried out in Tlemcen on LC in 23 children in a rural area in Tlemcen, between October 2005 and January 2006 showed a male predominance, 60% against 40% [14].

Another retrospective study on children's CL cases in the dermatology department of Hassan II hospital in Fez from 03 years between 2014 and 2016 recorded 12 cases with a ratio of 0.9 [15].

Also, in Tunisia, a monocentric and retrospective study was realized on all cases of CL for childhood,

observed on a period of 23 years at the Dermatology Department of Habib Thameur Hospital in Tunis between 1982 and 2004, demonstrated that among sixty children with CL, divided into 31 girls and 29 boys, a sex ratio of 0.9 [16].

No age group was spared from leishmaniasis. Children aged 1 to 10 years lead with 48.13% of identified cases. This high percentage could be due to the sensitivity of the skin at this age, weak immune system and the nudity of children, making them more vulnerable to insect bites, and thus most affected by the leishmaniasis [12].

#### 4.2 Endemic Characteristics and Seasonal Variation of CL

Cutaneous leishmaniasis continues to occur in Tlemcen in persons living in or having lived in endemic areas of Leishmaniasis.

Most cases were autochthonous (27 of 34). Seven (07) cases were from other towns known as endemic areas (Naama, El Bayadh), of which 04 were from bordering regions (Fig. 1). This same geographical distribution of the LC in Tlemcen was described in 1990 [8].

In our study, an autumnal preponderance was noted in 30% of cases of CL. Studies concerning CL in Tlemcen province in 1990 [8] and 2008 [14] showed slight differences about epidemiologic profile of cutaneous Leishmaniasis, which depends on the variation of this disease as a function of time.

A study conducted on 386 cases of CL at the university hospital center of Mutapaha Bacha in Algiers showed that the majority of patients lived in the north of the country or had stayed in endemic areas. The highest incidence was observed in autumn and at the beginning of winter [11].

In Tunisia, autumn preponderance was noted at 41.6%. The study also showed that all of patients were living or staying in an endemic area, which is the case for our study [16].

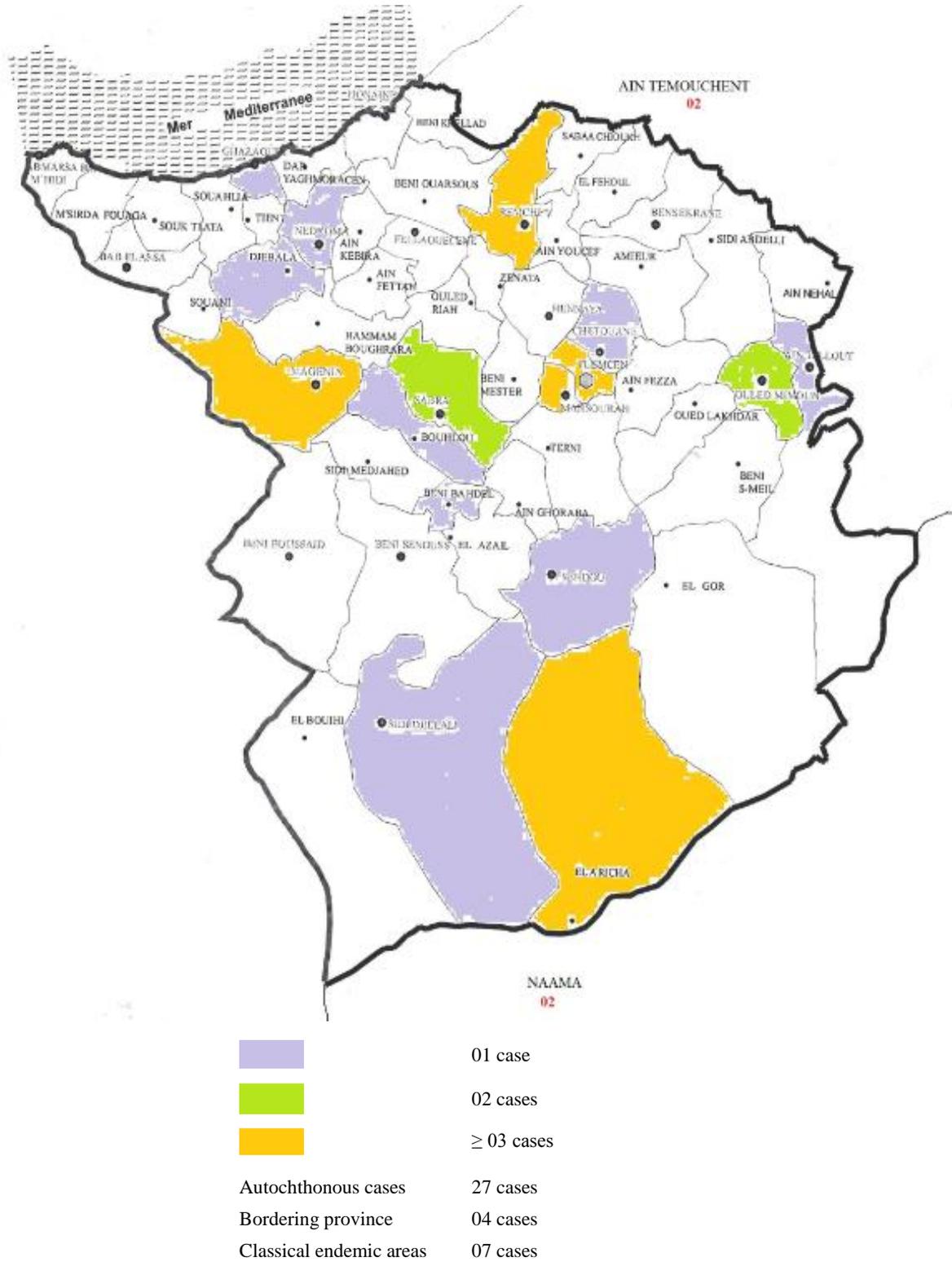


Fig. 1 Distribution of cutaneous leishmaniasis cases in different localities of Tlemcen between 2012-2016.

## 5. Conclusions

The knowledge of geographical spread of leishmaniasis in Tlemcen is still limited; there are endemic areas of cutaneous leishmaniasis that need to be identified in order to strengthen vector control measures in these areas.

The results of this data collection and analysis were conducted to identify the seasonal variation and spatial distribution of cutaneous leishmaniasis in Tlemcen, where the disease continues to be in the endemic state.

Vector control campaigns must be reinforced to fight against leishmaniasis in the town of Tlemcen, also, the improvement of habitat conditions for populations at risk.

Countries should evaluate their programs of the control of leishmaniasis regularly for compliance with the original objectives and procedures. Parameters should be established for elements of the program, such as vector management, case detection and treatment, including input, processing, output, outcome and impact indicators as well as definition of the targets to be achieved within a predetermined time [10].

## Conflict of Interest

No conflict of interest.

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