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Original Article

Evaluation of Cutaneous Leishmaniasis Cases in the Southeastern Border of Turkey in Recent Years

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Abstract

Background: Cutaneous leishmaniasis (CL), caused by protozoa of the genus *Leishmania*, is an infectious disease endemic to many countries, including the Southeastern Anatolia region of Turkey. The number of cases in this region has surged due to factors such as the Syrian civil war, migration, overcrowded living conditions, malnutrition, decreased sanitation, and delayed diagnoses. This retrospective study aimed to evaluate adult CL patients.

Methods: The patients admitted to the *Leishmania* Diagnosis and Treatment Centre from Jan 2019 to Jul 2023 were included to the study. Diagnosis was made by microscopic examination of Giemsa-stained samples from the serous fluid of cutaneous lesions, identifying the *Leishmania* amastigote form.

Results: The cohort included 59 females and 41 males with a mean age of 42.8±16.2 yr. The majority resided in urban areas (60%), with single lesions in 57% of cases and multiple lesions in 43%. No statistical difference was found in lesion count between urban and rural residents (P=0.408) or between genders (P=0.932). However, a significant difference in lesion characteristics was observed between Turkish patients and immigrants (P<0.001). Lesions primarily appeared as papules (44%) and nodules (36%), with extremities (65%) and head and neck (50%) being the most common sites. The most affected male age group was 18-29 yr (34.1%), while for females, it was 50-59 yr (27.1%).

Conclusion: CL remains a significant public health issue in the region, exacerbated by socio-economic conditions following the Syrian conflict. Therefore, updating epidemiological data, implementing vector control programs, and promoting disease prevention education are essential.

Keywords: *Leishmania*; Protozoa; İmmigrant

Introduction

Leishmaniasis, caused by protozoan parazite of the genus *Leishmania* and transmitted by infected female Phlebotomus sandflies, can present in various forms affecting internal organs and cutaneous tissue (1). CL is the most common form, with an estimated 700,000 to 1 million new cases

annually worldwide (2). Sandfly activity peaks at temperatures between 16-44 °C, mainly during spring and summer, continuing into autumn. The disease is endemic in regions such as Asia, South America, Central America, the Middle East, East Africa, and North Africa. Socioeconomic, environmental, and political factors significantly influence its epidemiology. Turkey is particularly vulnerable due to its geographical location, the influx of Syrian refugees, and seasonal variations (3, 4). Due to the migration that started with the Syrian civil war, has led to increased CL incidence in Southeastern Anatolia, presenting a major public health challenge (5).

The incubation period in leishmaniosis with cutaneous involvement varies from weeks to months. Some skin changes may occur during this time. These are papule (a circumscribed, elevated, solid lesion that is less than 10 mm in diameter), nodule (a palpable, solid lesion that is greater than 10 mm in diameter), plaque (a circumscribed, elevated, solid lesion that is greater than 10 mm in diameter and is usually broader than it is thick.) and ulcer (a circumscribed loss of the epidermis and at least upper dermis)(6). Cutaneous findings usually start as a single, pink-coloured papule, develop into a nodule and plaque-like lesion and then may appear as a painless ulcer. However, lesions may also start as multiple (7).

The diagnosis of CL is based on clinical and epidemiological data and laboratory tests. The definitive diagnosis is made by demonstrating the parasite in a sample taken from the cutaneous lesion by microbiological, culture or molecular (PCR) methods (8).

The primary approach in the treatment of CL is locally effective therapies. The most commonly used drugs for this purpose are pentavalent antimony compounds (meglumine antimonate and sodium stibogluconate). They can be applied into the lesion and can also be used for systemic treatment. Cryotherapy is another treatment option for leishmaniosis and can be applied alone. However, depending on the lesion type, number, size, localisation and complications of the case, it can be used alone or in combination with locally/systemically effective drugs (9).

We aimed to evaluate the to retrospectively evaluate 100 adult patients diagnosed with CL in Gaziantep province of Turkey bordering Syria. It also wanted to emphasize that a disease that was previously under control is on the rise again with the Syrian civil war.

Materials and Methods

We retrospectively analyzed adult CL patients (18 yr and older) who visited the *Leishmania* Diagnosis and Treatment Centre between Jan 2019 and Jul 2023. Data collected included age, gender, lesion sites, living areas, treatment modalities, and yearly case numbers. The cutaneous lesions of the patients with a prediagnosis of CL were cleaned with 70% alcohol and the blood from the incision was wiped with a sterile scalpel. Diagnoses were confirmed by identifying the *Leishmania* amastigote form in Giemsa-stained serous fluid samples from cutaneous lesions.

Statistical Analysis

Descriptive statistics of the variables used in the study are given as frequency and percentage values for qualitative variables, median, minimum and maximum values for quantitative variables. The suitability of the quantitative variables for normal distribution was analysed by Kolmogorov-Smirnov test. Mann-Whitney U, Kruskal-Wallis, Chi-Square (Fisher's exact test), and Spearman's rank correlation, were performed using IBM SPSS ver. 25.0 (IBM Corp., Armonk, NY, USA), with a significance level of $P<0.05$.

Ethical approval

This study complied with the standards of medical ethics as so endorsed by decision 311.31.03, dated 24.10.2023, of the Ethics Committee of Gaziantep Islam Science and Technology University.

Results

Out of 205 CL patients, 105 pediatric cases were excluded, focusing the study on 100 adults. The cohort comprised 59 females and 41 males, with an average age of 42.8 yr. Most patients resided in urban areas (60%), and 21% were immigrants. The demographic data, clinical features and treatment modalities of patients with CL were shown (Table 1). The highest number of cases were observed in the age range of 18-29 yr with 34.1% in males, while the highest number of cases were observed in the age range of 50-59 yr with 27.1% in females. When single and multiple lesions were analysed, the highest number of single lesions was found in the age range of 18-29 yr with 29.8%, while the highest number of multiple lesions was found in the age range of 50-59 yr with 37.2%.

Table 1: Frequency distribution of cases

Variables		Number	%
Gender	Female	59	59
	Male	41	41
Race	Immigrant	21	21
	Turkish	79	79
Place of residence	Urban area	60	60
	Rural area	37	37
	Slum area	3	3
Number of lesions	Single	57	57
	Multiple	43	43
Lesion characteristics	Papule	44	44
	Nodule	36	36
	Plaque	2	2
	Ulcerated nodule	6	6
	Ulcerated Plaque	12	12
Lesion location			
Head-neck	None	50	50
	Yes	50	50
Extremities	None	35	35
	Yes	65	65
Body	None	97	97
	Yes	3	3
Treatment type			
Local treatment	No	14	14
	Yes	86	86
Systemic treatment	No	82	82
	Yes	18	18
Cryotherapy	No	96	96
	Yes	4	4

The association between lesion characteristics, gender, race and site of involvement was analysed and no statistically significant association was found between lesion characteristics and site of involvement, between gender and site of involvement and between race and site of involvement (P=0.250, P=0.260, P>0.999, respectively) (Table 2). No statistically significant correlation was found between gender and lesion characteristics, whereas a statistically significant correlation

was found between race and lesion characteristics (P=0.370 and P<0.001, respectively) (Table 3). No statistically significant difference was found between the number of lesions and the residential area (P=0.408) and there was no statistically significant difference between men and women in terms of the number of lesions (P=0.932).

Table 2: Association between lesion characteristics, gender and race variables and site of involvement

Site of involvement n (%)							
Lesion characteristics	Extremities	Extremities and body	Head-neck	Head, neck and body	Head, neck and extremities	Extremities, head-neck and body	*P*
Papule	17 (38.6)	0 (0)	17 (38.6)	1 (2.3)	9 (20.5)	0 (0)	0.250*
Nodule	19 52.8)	0 (0)	14 (38.9)	0 (0)	2 (5.6)	1 (2.8)	
Plaque	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
Ulcerated nodule	3 (50)	0 (0)	2 (33.3)	0 (0)	1 (16.7)	0 (0)	
Ulcerated plaque	8 (66.7)	1 (8.3)	1 (8.3)	0 (0)	2 (16.7)	0(0)	
Gender							
Male	23 (56.1)	1 (2.4)	10 (24.4)	0 (0)	7 (17.1)	0 (0)	0.260*
Female	26 (44.1)	0 (0)	24 (40.7)	1 (1.7)	7 (11.9)	1 (1.7)	
Race							
Immigrant	11 (52.4)	0 (0)	7 (33.3)	0 (0)	3 (14.3)	0 (0)	>0.999*
Turkish	38 (48.1)	1 (1.3)	27 (34.2)	1 (1.3)	11 (13.9)	1 (1.3)	

*Fisher's exact test

Table 3: Association between gender and race variables and lesion characteristics

Lesion characteristics n (%)						
Gender	Papule	Nodule	Plaque	Ulcerated nodule	Ulcerated plaque	*P*
Male	22 (53.7)	14 (34.1)	0 (0)	1 (2.4)	4 (9.8)	0.370*
Female	22 (37.3)	22 (37.3)	2 (3.4)	5 (8.5)	8 (13.6)	
Race						
Immigrant	13 (61.9)	2 (9.5)	2 (9.5)	1 (4.8)	3 (14.3)	<0.001*
Turkish	31 (39.2)	34 (43.0)	0 (0)	5 (6.3)	9 (11.4)	

*Fisher's exact test

Discussion

CL is auncontrolled and a neglected tropical disease worldwide, with an incubation period ranging from weeks to months. In many countries, incidence numbers are likely underestimated because cases are not recognized and access to health facilities is limited (10). Socioeconomic, cultural, and environmental factors significantly influence its incidence. The Syrian civil war has exacerbated CL prevalence in Turkey, Jordan,

and Lebanon due to massive migration, healthcare disruption, and deteriorating living conditions (11, 12). In a study conducted among Syrian immigrants, the seroprevalence of CL was found to be 32% (13). In Turkey, 7794 cases of CL were reported between 2012-2016. According to population records, the proportion of registered Syrian immigrants has reached 4.4% of Turkey's total population (14). After the Syrian civil war, many studies evaluating patients diagnosed with CL have been reported both in Turkey and in the world.

Studies show varying age and gender distributions of CL cases, with younger age groups and females often being more affected (15). This study aligns with these findings, the highest number of cases was found in the age range of 18-29 yr in males (34.1%) and in the age range of 50-59 yr in females (27.1%). In a study of 245 patients in Saudi Arabia, the highest number of cases was found in the 21-40 age range (52.7%) (16). In Ethiopia, 205 CL patients were evaluated, the highest number of cases was found in the age range of 16-45 yr(17). Similarly, in Sri Lanka and Iran, most cases were observed in the 21-40 age range (18, 19). In many studies, cases were clustered in the younger age group. The reason why it was less frequently detected in the elderly may be acquired immunity against the disease or less presentation to the clinic.

There are some studies showing the distribution of cutaneous leishmaniosis between genders. In a study on 249 patients in Syria, the rate of females diagnosed with CL was 41.8% (20). In a study involving 77 patients in a province in the Southeastern Anatolia region of Turkey, the proportion of female cases was 61%, in a study involving 1565 patients it was 34.2% and, in another study, involving 117 patients it was 53% (4, 21, 22). The distribution of the cases according to gender varies according to the regions and the number of cases. In our study, the female rate was 59% and it was compatible with the data of many studies in the literature.

In our study, 57% of the patients had a single lesion. The rate of single lesion was found to be 70% in the study of İnci et al, 43% in the study of Salman et al, 38.4% in the study of Al-Dhafiri et al and 60% in the study of Bisetegn et al (4, 5, 16, 17). In another study involving 1565 patients with CL, the number of single lesions was higher in both males (70%) and females (72%) (23). There are studies in the literature including cases with single or multiple lesions. In our study, no statistical difference was found in terms of the number of lesions between those living in urban, rural or slum areas.

This study, papule was the most common lesion in both gender groups. When analysed in terms of race, nodules (43%) and papules (39.2%) were predominant in Turkish patients, whereas papules (61.9%) were more common in immigrants (P<0.001). In the study of Galgamuwa et al. the most common lesions presenting to the clinic were nodules (18). In the Ethiopian study, the most common appearance of the lesions was plaque (30.7%) and the most common anatomical site of involvement was the head and neck region (59%) (17). In Alraey's study, the most common anatomical sites of involvement were the head and neck (58% in males and 62% in females) and upper extremities (31% in males and 29% in females) (21). In the study 137 CL patients were evaluated, cutaneous lesions were most commonly observed in the extremities in both gender groups (P<0.05) (19). In our study, the most common sites of involvement were extremities and head and neck, respectively. We consider that variables such as the number of cases and the time of clinical presentation may cause the differences between the studies.

In this study, cases mostly consisted of people living in urban areas. In the study in which patients diagnosed with CL between 2011 and 2013 in Iraq were evaluated, the majority of the cases were in rural areas (23). In studies in Saudi Arabia and Ethiopia, the number of cases in rural areas was higher (16, 17). The higher number of cases in rural areas may be due to the fact that local people are engaged in agricultural activities. However, in recent years, cases have shifted towards urban areas due to reasons such as rapid urbanisation, rural-urban migration movements, economic or forced migration (earthquake, flood,

drought, war, etc.) (24, 25). The proportionally higher number of patients in the urban region in our study may be due to the fact that our diagnosis and treatment centre is located in the urban region and patients receiving treatment in rural areas do not apply to our centre. Migrants are mostly followed up in *Leishmania* screening centers in tent cities explains the low number of migrants in our study. Since the majority of migrants were treated in tent cities, the majority of the applicants to our hospital were Turkish people.

Limitations

This study had some limitations. Firstly, the number of cases was relatively small as a result of the evaluation of patients from a single centre. Secondly, the difficulty in accessing health services by people living in rural areas and the fact that migrants living in tent cities apply to our centre less may not indicate the actual prevalence of the disease in our region.

Conclusion

CL is an infectious disease that can be observed in individuals of any age and gender. Factors such as natural disasters, war and socioeconomic factors may lead to an increase in the incidence. These conditions may lead to delays in the diagnosis and treatment of the disease. The change in the population structure of our country, especially due to the Syrian civil war for more than 10 years, has led to an increase in CL cases. For these reasons, updating epidemiological data, effective implementation of vector control programmes, conducting routine health screenings and developing educational activities to prevent the transmission of *Leismania spp.* species are vital for controlling the infection.

Journalism Ethics considerations

Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of Interest

The authors did not declare any conflicts of interest.

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