

Evaluation of clinical and demographic characteristics of Turkish and Syrian pediatric cutaneous leishmaniasis patients from Hatay, Turkey after the Syrian civil war

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Abstract

Introduction: Cutaneous leishmaniasis (CL) is a skin disease affecting all ages but especially children. Cutaneous leishmaniasis exists in Turkey, and, especially together with emigration from Syria to Turkey in recent years due to the civil war in Syria, the incidence of the disease has increased.

Aim: To investigate Syrian patients (SP) and Turkish patients (TP) in the pediatric age group who were diagnosed with CL and to compare the age, gender, clinical type, number of lesions, and lesion localizations of these patients.

Material and methods: We included CL patients aged 0-18 who were admitted to the outpatient clinic in the period 2015–2017 and in the first half of 2018. A total of 121 patients (SP, $n = 87$; TP, $n = 34$) were included in the study.

Results: The mean ages of TP and SP were 12.06 ± 4.47 and 8.68 ± 5.18 years and the disease durations were 6.25 ± 3.86 and 4.73 ± 3.39 months respectively ($p = 0.049$). The total number of lesions was 247. The mean lesion number per child was 2.35 ± 2.28 in SP, and 1.23 ± 0.55 in TP ($p = 0.002$). Two and multiple lesions were significantly higher in SP ($p = 0.005$). It was found that the lesions were most frequently located in the head/neck (HN) region (76.9%) and 44.1% of patients with HN localization belonged to the 7–12 age group. We also found that 57.1% of the HN lesions were of the papule type in the patients.

Conclusions: We obtained similar results as in other studies in terms of age, gender, localization, and duration of lesions in general. When SP and TP were compared, we found that the number of lesions was higher, the disease duration was shorter, and the mean age was younger in SP.

Key words: cutaneous leishmaniasis, pediatric, Syria, Turkey.

Introduction

Cutaneous leishmaniasis (CL) is the disease caused by *Leishmania* spp., an intracellular parasite. More than 70% of all CL cases are seen in 10 countries worldwide, which are Afghanistan, Algeria, Brazil, Colombia, Costa Rica, Ethiopia, the Islamic Republic of Iran, Peru, Sudan, and the Syrian Arab Republic [1]. It was reported that the causative agents of the disease are *L. tropica* and *L. major* in Syria [2, 3].

Turkey is one of the countries where CL is also prevalent [1]. Studies conducted in Turkey have shown that the predominant causative agent of CL is *L. tropica* [4]. Cutaneous leishmaniasis is endemic in Turkey, especially in the Southeast and the Mediterranean region [5]. However,

in the last 5–6 years, many Syrian people have immigrated to Turkey due to the civil war in Syria. As a result, the incidence of the disease has increased considerably, especially in the areas of intense emigration [6, 7]. Hatay province of Turkey, located in the Mediterranean region, is one of the cities most affected by the migration due to its border with Syria.

Cutaneous leishmaniasis is more common especially in the childhood and young age group (0–20 years of age) [8, 9]. Although the studies reported from Turkey previously described the clinical and demographic data of the disease, a relatively small number of studies have focused on this age group in detail [10].

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Aim

The aim of this retrospective study was to evaluate the clinical and demographic data of Syrian immigrant and Turkish children diagnosed with CL, who were consulted in our Dermatology Outpatient Clinic, and to compare Syrian patients (SP) and Turkish patients (TP) with respect to age, gender, disease duration, and localization, number and type of lesions. So far, this is the first study in which pediatric CL patients from the Hatay region have been examined in detail.

Material and methods

In the present study, we included CL patients aged 0-18 years and recorded their clinical and demographic data. The patients were admitted to our outpatient clinic in the period 2015–2017 and in the first half of 2018. A total of 121 patients (55 (63.2%) male, 32 (36.8%) female SP; 19 (55.88%) male and 15 (44.1%) female TP) were included in the study. The diagnosis of CL was made by showing parasites in the smears taken from the lesions. Demographic and clinical data of patients were recorded from patient files. Statistical analysis was performed by dividing the patients into 0–6, 7–12, and 13–18 age groups.

Statistical analysis

Data were analyzed using SPSS for Windows (version 21; IBM Corp, Armonk, New York, USA), χ^2 , Kruskal-Wallis, Mann-Whitney *U*, and Yates’s continuity correction tests were used for statistical analysis. Values were presented as the mean \pm standard deviation and $p < 0.05$ was considered as significant.

Results

Patients’ ages ranged from 1 to 18 years (mean: 9.63 \pm 5.2). The mean ages of TP and SP were 12.06 \pm 4.47 (3–18 years) and 8.68 \pm 5.18 (1–18 years) respectively. Fifty percent of the TP were in the 13-18 age group, and 39% of the SP were in the 7–12 age group (Table 1). There was no relationship between age groups and gender in all patients ($p = 0.629$). The SP and TP also did not show any relationship regarding gender and age group within themselves (SP $p = 0.644$, TP $p = 0.460$).

Table 1. Distribution of TP and SP by age group and gender

Age	TP			SP			Total n (%)
	Male	Female	%	Male	Female	%	
0–6	3	2	14.7	19	14	38	38 (31.4)
7–12	5	7	35.3	22	12	39	46 (38)
13–18	11	6	50	14	6	23	37 (30.6)
Total	19	15	100	55	32	100	121 (100)

The average disease duration was 5.15 \pm 3.57 months (range: 1 week–12 months) (definition of “disease duration”: the time period between the appearance of the first lesion and the arrival of the patient at the hospital for examination). There was no significant difference between the age groups regarding disease duration ($p = 0.943$). The disease durations in SP and TP were 1 week–12 months (mean: 4.73 \pm 3.39 months) and 1–12 months (mean: 6.25 \pm 3.86 months) respectively ($p = 0.049$). In the same analysis, we did not include the disease durations of 6 patients because when the outlier analysis was performed, the disease duration was deflecting. The disease durations of these patients were in the range 30–60 months and 4 of them were SP while 2 of them were TP.

The total number of lesions was 247 ($n = 42$ in TP, $n = 205$ in SP), and the mean number of lesions per patient was 2.04 \pm 2.01. There was one lesion in 61.2% of the patients and 2 lesions in 19.8% of the patients. When TP and SP were analyzed separately, 82.4% ($n = 28$) of the TP had one lesion, 11.8% ($n = 4$) had 2 lesions, and 5.9% ($n = 2$) had 3 lesions, while 52.9% ($n = 46$) of SP had one lesion, 23% ($n = 20$) had 2 lesions, and 23.9% ($n = 21$) had ≥ 3 lesions. Although there was no statistically significant difference between the age groups in terms of number of lesions ($p = 0.207$, Kruskal-Wallis test), the mean number of lesions was the highest in the 7–12 age group (2.54 \pm 2.43). When TP and SP were evaluated within themselves, mean lesion number was 2.35 \pm 2.28 (1–11 lesions) in SP, and 1.23 \pm 0.55 (1–3 lesions) in TP. Between two groups, the number of lesions per patient was significantly higher in SP ($p = 0.002$) compared to TP and two and multiple lesions were significantly higher in SP ($p = 0.005$). Regarding age group, when TP and SP were evaluated separately, the number of lesions in SP was the highest in the 7–12 age group (mean: 3.029, $p = 0.049$). This was followed by the 13–18 age group. There was no significant difference with respect to number of lesions in all three age groups of TP ($p = 0.653$; Bonferroni corrected Mann-Whitney *U* test) (Table 2).

It was found that the lesions were most frequently located in the head/neck (HN) region ($n = 93$, 76.9%) in the patients. 44.1% ($n = 41$) of the patients with HN localization were in the 7–12 age group. This was followed by the age groups 0–6 (32.3%, $n = 30$) and 13–18 (23.7%, $n = 22$). When the age groups of SP and TP were evaluated within themselves, HN localization was most frequently observed in the 7–12 age group in both groups (SP; $n = 29$, 42.6%; TP; $n = 12$, 48%). This was followed by the 0-6 age group in SP, and the 13–18 age group in TP. When the SP and TP were compared in terms of location of the lesions, it was found that the localization of HN was more frequent in TP than in SP (73.5% and 59.8% respectively, $p = 0.05$). We found that 57.1% of the HN lesions were of the papule type. In addition, 63.6% ($n = 7$) of the extremity-localized lesions were of the ulcer type. Clinical samples are shown

in Figure 1. When SP and TP were evaluated separately, again the most common type of lesion was papule (with 52.9% and 55.9% respectively; for both $p = 0.001$).

The cheek area lesions in both patient groups have the highest frequency (SP 19.5%, TP 19%). Diffuse infiltration was present in 3 of the patients with lip lesions. The localization and the number of the lesions in TP and SP are shown in Figure 2 and the distribution of lesion types is shown in Table 3.

Discussion

Although CL occurs at all ages, it is most common among children and teenagers [6, 10, 11]. In our study, we found that the mean age of TP was significantly higher than SP. This difference in our study may be due to the difference between the numbers of patients in both groups as well as the higher recognition of the disease among SP. The most frequently affected age group in our study was 7–12 in SP and 13–18 in TP. It has been previously reported that CL disease was more frequently observed between the ages of 11–15 [12] and 13–24 [13] in Hatay province where all age groups were included in these studies, which is also compatible with our study. Uzun *et al.* reported that the disease was most commonly seen in the 10–19 age group [8]. In another study comprising the 0–15 age group, the 6–10 age group was identified as the most infected group [10]. If we look at the results of other studies comprising pediatric age groups bearing CL in Iran and Tunisia, we see that 6–9

Table 2. Distribution of number of lesions according to age groups

Group	Age groups	Lesion number	Mean ± SD	p_1	p_2
SP	0–6	50	1.51 ± 0.795	0.049	0.002
	7–12	103	3.02 ± 2.657		
	13–18	52	2.60 ± 2.854		
	Total	205	2.35 ± 2.282		
TP	0–6	7	1.40 ± 0.894	0.653	
	7–12	14	1.16 ± 0.577		
	13–18	21	1.23 ± 0.437		
	Total	42	1.23 ± 0.553		
Overall total		247	2.04 ± 2.018		

p_1 – number of lesions according to age groups in Syrian and Turkish patients, p_2 – evaluation of lesion numbers of Syrian and Turkish patients.

[14] and 6–15 age groups [15], respectively, were more frequently affected.

Among our patients, gender was homogeneously distributed within all age groups. Some of the reports conducted in these age groups are consistent with our results [11]. However, Aksoy *et al.* reported that CL was more frequently present in females [10].

We found that the disease duration in our study was significantly shorter in SP than in TP (SP: 4.73 ± 3.39

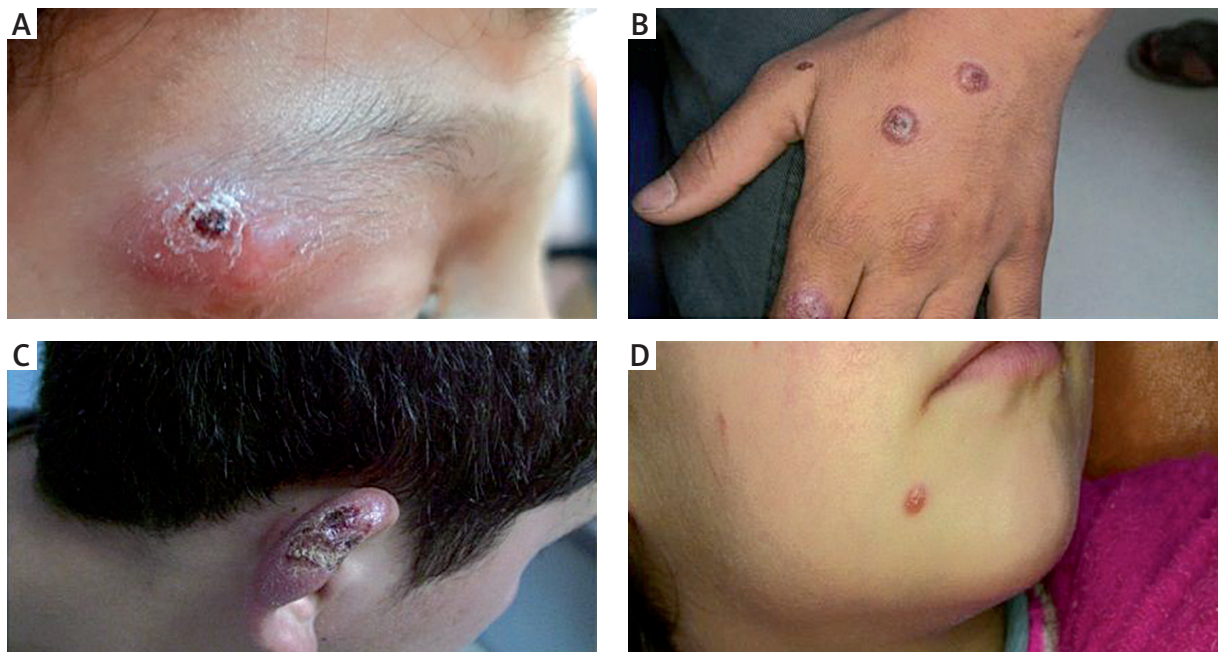


Figure 1. A – A nodule located in the periorbital region, B – multiple nodules of hand, C – ulcerated lesion in the ear, D – A papule located on the chin

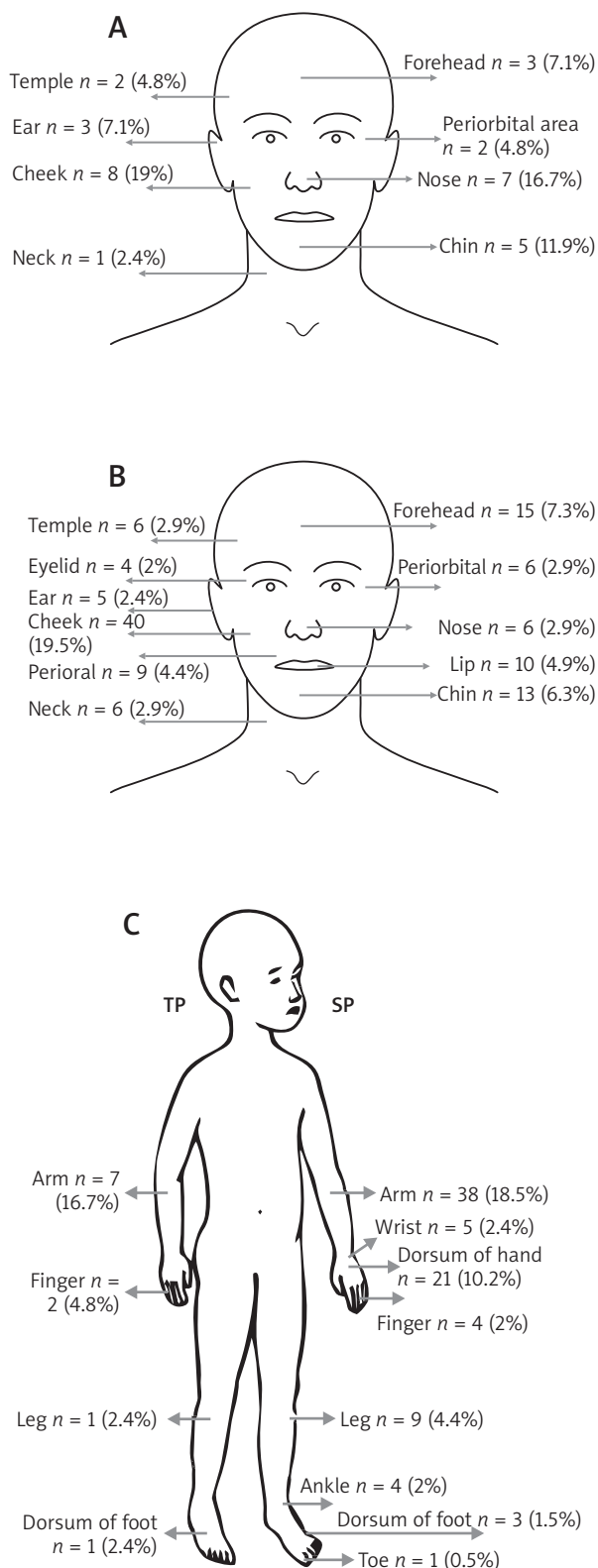


Figure 2. A – Distribution of lesions located in HN region in TP, B – distribution of lesions located in HN region in SP, C – distribution of lesions located in extremities in TP and SP

months, TP: 6.25 ± 3.86 months). We did not find any difference in the disease duration among the age groups. However, Aksoy *et al.* reported that the 0–5 age group had the longest disease duration [10].

In our study, the average number of lesions per patient was 2.04 ± 2.01 . However, when the groups were compared, the mean number of lesions in SP was 2.35 ± 2.28 , while it was 1.23 ± 0.55 in TP ($p = 0.002$). 82.4% of TP and 52.9% of SP had only one lesion and two and multiple lesions were significantly higher in SP ($p = 0.005$). Our results concerning TP were consistent with the results of Aksoy *et al.* and Gürel's *et al.* studies reported from Turkey [10, 11]. The results of the studies carried out in other countries involving the pediatric age group are as follows: a study in Pakistan reported that 75% of patients had a single lesion and the mean number of lesions per patient was 1.43. 16.6% of patients had two lesions and 8.3% of patients had > 2 lesions [16]. In India, a single lesion (72.2%) was most frequently detected in the 0-5 age group of patients. The authors reported that 19.9% of patients had two lesions and 7.9% of patients had multiple lesions [17]. In another study from Iran, only one lesion was detected in 82.3% of patients, two lesions were detected in 12.4% of patients, and ≥ 3 lesions were detected in 5.3% of patients [18]. When the results of studies reported from other countries as well as Turkey were evaluated, the number of patients with multiple lesions was higher in SP (23% of patients had two lesions and 23.9% of patients had ≥ 3 lesions). This may be due to inadequate shelter, a crowded environment, and lack of hygiene caused by adverse conditions of migration.

Similar to the results of other studies, it was determined that the HN site was the most common localization of CL in our study [10, 14, 15]. When assessed according to age groups, 44.1% ($n = 41$) of patients with HN localization were in the 7–12 age group. Aksoy *et al.* reported that HN localization was more frequently observed in the 0–5 age group [10]. In our study, the cheek area was the part where CL was most frequently localized in both SP and TP. In other studies conducted with the childhood age group, it has been reported that the cheek is the region most frequently affected by CL [14–16]. The cheek was proposed to be the area most exposed and the least protected from sandfly bites [16].

In our study, papules were the most common type of lesions and most frequently seen in the 7–12 age group. 57.1% of the HN lesions were of the papule type. Another interesting result of our study is that in 63.6% ($n = 7$) of patients with ulcer type the lesions occurred on extremities. When other studies were reviewed, it was observed that papules [14], plaques [16], plaques or papulonodules [17] or ulcers [10] were reported as the most common types of lesions.

In a study conducted by Turan *et al.*, the number of lesions was higher and disease duration was shorter in

Table 3. Distribution of lesion types according to age group

Group	Age group	Papule n (%)	Nodule (%)	Plaque (%)	Ulcer (%)	Other* (%)
TP	0–6	1 (14.28)	1 (14.29)	4 (57.14)	1 (14.29)	–
	7–12	14 (93.33)	–	1 (6.67)	–	–
	13–18	8 (40.00)	6 (30.00)	4 (20.00)	2 (10.00)	–
SP	0–6	28 (56.00)	6 (12.00)	11 (22.00)	4 (8.00)	1 (2.00)
	7–12	85 (76.58)	9 (8.11)	10 (9.01)	5 (4.50)	2 (1.80)
	13–18	30 (68.18)	4 (9.09)	5 (11.36)	5 (11.36)	–
Total		166 (67.21)	26 (10.53)	35 (14.17)	17 (6.88)	3 (1.21)

SP, similar to the results of our study [18]. In our study, we also found that the papular type of CL lesion was frequent in both TP and SP. Turan *et al.* reported that nodules were more common in SP whereas ulcers were more frequent in TP [19]. Another study from the same region of Turkey reported that ulcers were the more common type of CL lesions [10]. This may be because of the difference in the species of microorganism that causes CL.

Conclusions

In the present study, we obtained results similar to previous studies in terms of age, gender, and the localization and duration of CL lesions in general. When SP and TP were compared, we found that the number of lesions was higher, disease duration was shorter, and the mean age was lower in SP.

Acknowledgments

The illustrations in Figure 2 are taken from the following internet addresses:

https://www.rch.org.au/uploadedImages/Main/Content/clinicalguide/guideline_index/adult-head-front-and-back.gif (Head/neck)).

https://www.rch.org.au/uploadedImages/Main/Content/clinicalguide/guideline_index/anterior-body-from-the-right.gif (Body).

Conflict of interest

The authors declare no conflict of interest.

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