Original Article

Children and cutaneous leishmaniasis: a clinical report and review

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Abstract

Introduction: Mashhad, located in north-east Iran, is one of the most important regions for cutaneous leishmaniasis (CL) due to *Leishmania tropica*. Children account for 7-10% of the infected population in the endemic areas. Despite the high sensitivity and susceptibility of this age group, no comprehensive study has yet investigated the clinical characteristics and demographic data in children in our region. Therefore, we aimed to study the clinical features and demographic information in children visiting the *Leishmania* clinic of two main teaching hospitals.

Methodology: In a cross-sectional study all the required data were gathered from the children's records available at the cutaneous leishmaniasis clinics of Ghaem and Imam Reza hospitals during October 2008 to September 2011. Data included the patient's age, sex, lesion chronicity and distribution, the clinical features, and the involved body parts. Descriptive statistical tests and SPSS version 11.5 were used for data analyses.

Results: Among the 8,801 studied files, 689 (7%) were related to children under the age of 13. Female to male ratio was 0.9 with the highest prevalence in the 6-9 year age group. Regarding disease chronicity, the most common types were acute cases with a 71% prevalence rate. The face was the most involved body part (77.2%) and papules with 37% prevalence were the most common type of lesions seen.

Conclusion: Childhood cutaneous leishmaniasis accounts for a major portion of CL in north-east Iran, has no apparent sex preference, and its clinical spectrum does not remarkably differ from that of adult CL.

Key words: cutaneous leishmaniasis (CL); children; demographic data; clinical features

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Introduction

Cutaneous leishmaniasis (CL) is an infectious skin disease caused by the species of the *Leishmania* parasite. Iran is part of one of the seven endemic regions of leishmaniasis worldwide [1]. Mashhad, capital of Razavi Khorasan province, located in the north-eastern region of Iran, is one of the major reservoirs of leishmaniasis due to *L. tropica* [2,3,4]. CL affects various age groups depending on the infecting *Leishmania* species, geographic location, disease reservoir, and host immunocompetence [5].

Based on several reports, children constitute 7-10% of such cases in the endemic regions [6]. Moreover, several reports have been published on the different therapeutic responses to conventional treatment modalities in comparison to adults [7,8]. Although this sensitive and susceptible age group constitutes the main target group for this disease [9-11], no comprehensive study has yet been performed on the clinical features and demographic data in this specific group in the mentioned region. Therefore, the aim of our study was to collect this type of information from this high-risk age group.

Methodology

In this cross-sectional study, the records of all leishmaniasis affected patients visiting the CL clinics of Ghaem and Imam Reza Teaching Hospitals during the years 2008 to 2011 were studied. The inclusion criteria consisted of children 13 years of age and younger in whom CL was confirmed by direct skin smear stained with Giemsa or by PCR in certain cases with a negative direct skin smear.

The cases were excluded from the study if the files did not contain all the required data. During the study period the records of 689 patients were studied. All the available information including the patient's age, sex, clinical features, lesion duration and distribution, clinical features, and the involved body parts were gathered from the records. Descriptive statistical tests and SPSS software package version 11.5 (IBM SPSS, Chicago, USA) were used for data analyses.

Results

Among the 8,801 files available at Ghaem and Imam Reza hospital clinics, 689 (7%) belonged to children 13 years of age and less. All the studied cases were residents of Mashhad and its suburbs. Out of the 689 cases, 350 (50.7%) were male and 339 (49.3%) female. Based on statistical tests, no significant difference was observed regarding a sex preference in the infected cases ($p = 0.84$). The patients' mean age was 6.48 years (range: 7 months to 13 years). The age distribution of the studied cases was as follows: infants (0 to 2 years) constituted 144 (20%) cases; toddlers (3 to 5 years) 154 (22%) cases; children (6 to 9 years) 2,440 (33%) cases; ten- to twelve-year-olds 144 (20%); and 13-year-old teens constituted 18 (2.6%) of the cases. The highest involvement was seen in the age group 6 to 9 years. No relationship was found between sex and the affected age group ($p = 0.38$).

A positive family history for leishmaniasis was seen in 27% of the cases. The frequency distribution of the affected body parts were as follows: face, 532 (77.2%); neck, 28 (4.1%); trunk, 9 (1.3%); upper extremities, 160 (23.2%); and lower extremities, 92 (13.4%). In the facial area the cheeks had the highest involvement at 72% followed by the forehead and nose. Considering disease chronicity, acute cases (less than a one-year disease course) comprised 489 (71%) of all samples followed by chronic cases and chronic lupoid leishmaniasis with 10.7% and 8.3% cases, respectively.

The most prevalent clinical presentation of the lesions was as follows: papules 255 (37%); plaques 231 (33%); nodules 83 (12%); ulcers 80 (11.6%); lupoids (8.1%); zosteriform (0.1%); scaly papules and plaques (2.3%); crusted papules and plaques (0.7%); and warty lesions (0.1%). There were no records of erysipeloid and sporotrichoid. The most prevalent lesion types were papules, plaques, and nodules.

Discussion

Despite the fact that children are a major target group for leishmaniasis, most studies have focused on the whole infected population, regarding both the therapeutic aspects and also the epidemiology and diagnostic aspects of the disease. Hence, very few studies have investigated children's age groups so far [6,12-15]. Although Iran is one of the few major endemic sources of CL infection, to the authors' knowledge, a very limited number of studies have investigated and explored the clinical spectrum of this disease in affected children.

In a study by Enshaie *et al*. on children younger than 12 years of age visiting the research center for skin disease and leishmaniasis in Isfahan, the highest prevalence was observed in individuals under the age of four years (34.3%); the most common lesion type was papules (28.4%); the most commonly involved body part was the face (38.6%); and the least number of lesions the lupoid and sporotrichoid types at 1.9% and 2.4%, respectively [16].

Talari *et al*. studied 117 children with leishmaniasis in Bam, in the southern region of Iran. The age group most commonly affected was 6 to 8 years, and the most common lesion site was the face (47%), followed by the upper (19.7%) and lower (16.3%) extremities, respectively. The most prevalent clinical features were papulonodules, ulcers, sporotrichoid and impetigo and erysipeloid, respectively [15]. The Table shows the compared results of all studies that have been performed on children as the target group to date [5,12-14,16-18].

Among all the studies conducted on leishmaniasis in children, the current study has the largest sample size. As the outcomes reveal, in general the most involved body parts in children are the face and the upper extremities. No significant difference is seen in the mean age of the affected cases, nor in their sex. Only the study by Qasmi and colleagues in Morocco showed a higher mean age and a sex predominance in females, which could be due to the small number of studied cases [14].

Among all the available literature in this field, it seems that the highest variety in outcomes belongs to the most commonly observed clinical manifestation of the disease. However, this difference could be easily justified by considering the dominant leishmania species in that region beside the results from adult studies. In areas such as Mashhad and Isfahan in Iran, or Mozzafarabad in Pakistan, where *L. tropica* is the dominant species, papules, plaques and papuloplaques are the most common clinical features seen in leishmania lesions. However, in areas where *L. major* is dominant, including Kashan in Iran and Karachi in Pakistan, and Venezuela with *L. (V.) braziliensis*, the ulcerative lesions are more common.

Nevertheless, as the results of most of these studies show, clinical features in the children of each region are not very different from those of adults living in that same area [19-23].

Table. Comparison of the results of all studies on cutaneous leishmaniasis having been performed on children as the target group

First Authors	Publication	Area of study	Mean Age (yr) (commonest range)	Sex ratio: F/M	Common Clinical feature	Common locations	Number of Pt./Duration of study
Layegh P	2011	Mashad, Iran	6-9	0.96	Papule	Face Up ext.	689 2007-10
Enshaieh SH	1999	Isfahan, Iran	<4	0.8	Papule	Face up ext.	656 1996-7
Talari SA	2006	Kashan, Iran	9.75 (6-15)	0.83	Ulcer	Face Up ext.	117 2001-3
Qasmi S	2008	Morocco	10.2	5.5	Ulcers	Face	13 1995-2005
Delgado O	2008	North central Venezuela	9.2	2.9	Ulcer	Extremities	43 1997-2005
Bari AU	2008	Muzaffarabad Pakistan	4-15 (8.72)	o.84	Psoriasiform Plaque	Face	96 2006-8
Shoaib Sh	2007	Karachi, Pakistan	1-14 (7)	0.56	Ulcer Nodule	Face Up ext.	185 1997-2001
Kharif M	2004	Tunisia	6-15 (8.75)	1.3	Papulonodular	Face	106 1989-2000
Fennich ES	2006	Tunisia	9.2	0.93	Crusted nodule	face	60 23 yrs

Studies by Bari *et al*. in Pakistan and Delgado *et al*. in Venezuela are the only ones which have reported differences in the clinical features of leishmaniasis lesions between children and adults [5,18].

Conclusion

Although the current study is an epidemiologic hospital-based study, its outcomes were consistent with other epidemiologic studies on childhood CL. It could be concluded that although children comprise a great number of the infected cases in the endemic regions, they not only have no different clinical features and demographic characteristics, but also follow a very similar pattern in disease progression when compared to adults.

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