A Clinical and Epidemiology Survey of Cutaneous Leishmaniasis in Childhood

'S.A. Talari, ^R. Talaei and ^G.R. Shajari

Cutaneous Leishmaniasis (CL) is endemic in the different parts of Iran and has long been recognized in most provinces. This study was conducted to determine the prevalence of childhood leishmaniasis in southeast of Kashan-Iran. Descriptive study was carried on all childhood referred to central laboratories during a 3 years period. Initial information including age, sex, sites of ulcer on the body, number of lesions, address, data and place of acquiring the disease. The study comprises 1625 children, the results showed the prevalence of 7.2% patients with lesions in the population, 4.2% of people displayed lesion scar and active ulcer 3%. The subjects age range from 6 years to 15 years (average 9.75 years). The M: F ratio was 1.2. All of our patients lived in an endemic area. The face was affected in 47% of cases. The encountered forms of leishmaniasis: populonodular 27.4%, ulcer 60.7%, sporotrichoid 6%, impetiginous 2.5% and erysipeloid 3.4%. Treatment with intramuscular meglumine antimonate 20-30 mg kg⁻¹ day is done for 93 patients. Meglumine antimonate treatment is well tolerated with no side effects. All leishmaniasis lesions healed within an average period of 2-14 months. Hyerpigmented scars were in 25.6% of the patients, atrophic scar 4.3% and hypopigmented scars was 3.4%. The findings of this study indicate increased prevalence of CL in the villages at the area of Kashan and Aran-Bidgol. The clinical finding pattern belonged to different endemic strains of *L. major* in Isfahan, which indicates the possible transmission of infection from Isfahan to this area.

**Key words:** Childhood leishmaniasis, cutaneous leishmaniasis, Kashan
INTRODUCTION

Leishmaniasis is endemic in 88 countries throughout Africa, Asia and Europe, North and South America. There are an estimated 12 million cases worldwide, with 1.5 to 2 million new cases each year (WHO, 1990, 1984).

Leishman and Donovan, working separately first described the Leishmania protozoan in 1903 (Herwaldt, 2003). Since then, this organism has been found to be a complex group of species, at least 20 of which cause infectious in humans (William et al., 2004). Some species cause visceral leishmaniasis, some cause cutaneous leishmaniasis and some cause both. Cutaneous leishmaniasis occurs in the New World and the Old World disease primarily is caused by Leishmania tropica in urban areas (dry type) and L. major (wet type) in dry desert areas (William et al., 2004).

The sandfly vector for leishmaniasis is genus Phlebotomus in the Old World and Lutzonia in the New World. The promastigote form of the parasite is a motile form with an anterior flagellum that develops in the sandfly. The parasite enters the human host with the bite of the sandfly and is pulled into macrophages by ingestion. Leishmania are able to survive in acidic environment of the lysosome and become amastigote forms. These forms are obligate, intracellular, nonmotile and about 2-7 microns in diameter. Amastigote form causes disease in humans and affects cellular immunity. CL begins as an erythematous papule at the site of sandfly bite on exposed parts of the body. Eventually, a sandfly will pick up this form while feeding and it will develop into the promastigote form again in the insect (William et al., 2004; Kafetzis, 2003).

Cutaneous Leishmaniasis (CL) is still considered as an important health problem in many parts of the world especially the Mediterranean region, some countries of Africa almost all countries of middle east and Iran (Ozbel et al., 1995; Khoury et al., 1996; Almohammadian et al., 1999; Momeni, 1994). The prevalence of infection is high in some provinces of Iran, including Isfahan (Nadim and Faghhi, 1988; Salimi, 2000), Shiraz (Moaddel et al., 1993), Khorasan (Javadian et al., 1967) and Khozestan and Kerman (Nadim and Seyed, 1971). Isfahan is a well known endemic area of Zoonotic Cutaneous Leishmaniasis (ZCL). In north east of Isfahan, the incidence of disease is high, especially in rural areas (Nadim and Faghhi, 1988; Salimi, 2000). In spite of some reports about increased rate of CL in north area of Isfahan province, however, there have been no previous reports of endemicity of ZCL around Kashan, 230 km north of Isfahan.

Although this disease does not cause mortality, but because of cosmetic disfiguration, prolonged period of lesions, great expense of treatment, length of cycle and side effects of the available drugs, it has create many problems (Momeni, 1994; Edrissian et al., 1982).

During last years, valuable studies have performed in Iran. According to the studies, the outbreaks of cutaneous leishmaniasis in Isfahan were 2.5% (Nadim and Faghhi, 1968; Salimi, 2000). This study was performed in order to determine the abundance and characteristics of cutaneous leishmaniasis in the childhood patients. The study aim to describe the epidemiological profile, therapeutic characteristics and outcome data of this dermatitis. This data would be useful in curing infected people preventing the spreading of this infection to the community and finally short term and long term planning of health centers for prevention and control the contamination of cutaneous leishmaniasis.

MATERIALS AND METHODS

This descriptive study was carried out on all patients clinically suspected of having CL was referred to central laboratory in Kashan, for parasitologic diagnosis during the period 2001 to 2003. Kashan is an ancient city; the area has a desert climate, very hot in the summer and cold in the winter. City located 230 kilometer north of Isfahan and 230 kilometer south of Tehran.

The diagnosis of cutaneous leishmaniasis is based on a clinical presentation and a positive parasitic smear. For each case having cutaneous lesions (ulcers or scars), a questionnaire was completed to record the necessary information such as name, age, sex, sites of ulcer on the body, address, data and place of acquiring the disease, previous travel history or location of study.

One hundred and sixty-four patients with skin lesions suspected of cutaneous leishmaniasis from villages at the Kashan area, Abozaidabad and Aran-Bidgol were selected for study. Skin scrapings from the edge of the lesion were obtained from each patient. The remaining skin scraping portion was smeared on a slide for staining with Gimsa stain and examined microscopically for presence of amastigote. The χ² test was used to determine any statistically significant difference in disease, the prevalence between female and male of patients.

RESULTS

During this 3 years period, information on 1625 children showed, the prevalence of ulcerative localized CL was 7.2% (117 cases from 1625 individuals) and cases with scar and ulcer were 4.2% (68 cases), 3% (49 cases) were
active ulcers. Parasites were isolated in smear from skin. Infections with leishmaniasis were recorded in 53 females (45.3%) and 64 males (54.7%). The highest rates in both species were recorded in the age group 6 to 8 years (45.3%). The lowest rates (20.5%) were recorded in the age groups 12-15 years.

The overall scar rate was 4.2% and the prevalence of ulcers was 3%. Single lesion was seen in 51.3% of patients, appearing as a round popular plaque with a diameter of 4-80 mm. Double lesions were observed in 23% of patients and 25.7% of patients showed multiple (3-15) lesions. Lesions were mainly located on the face and neck (47%) compared with (19.7%) on the hands and arms and (16.3%) on the legs. Multiple lesions appeared on two or more sites of the body in 17% of the cases. Detailed distribution of lesion and scar according to the number of lesions and scars were shown in Table 1.

The face was the most commonly affected site (47%). The cheek was highest rates the site of involvement in 45.5% and the lowest rates in chin were recorded 3% (Table 2). The duration of disease at the time of presentation ranged from 20 days to 5 years with an average duration of 8-12 months.

All slides, which have been prepared by scraping the edges of ulcers of all patients contained parasites morphologically resembling *Leishmania major* (large vacuole in the cytoplasm). Affected children had an average age of 9.75 years. The youngest patients were 6 years old and the oldest was age 15. Distribution according to age showed that leishmaniasis affected children (6 years) in 18.3% of the cases. The sex ratio (M:64: F 53) was 1.2. The highest infection rate of 54.7% was recorded in males compared to 45.3% in females. The range of the patients was from 6 to 15 years old. The age groups and sex distribution for both species are shown in Table 3.

![Fig. 1: Distribution of leishmaniasis according to region of residence](image)

Patients’ residence, working place, travel history and the time of appearance of the lesions were important data for determining the locations where the infections might have taken place. The number of positive cases in the villages at the area of Abouzeidadbad, villages at the area of Kashan and Aran-Bidgol area is showed in Fig. 1. The highest infection rate (47%) was recorded in patients who are living or traveling in the villages at the area of Abouzeidadbad. The lowest rate (18%) was recorded for patients living or contracted the disease in the villages at the area of Kashan.

The study encountered five clinical forms of leishmaniasis: papulonodular (27.4%), ulcer (60.7%), sporotrichoid (6%), impetiginous (2.5%) and erysipeloid (3.4%). Treatment was well documented in 93 patients (79.5%). Twenty-two patients were lost to follow-up and two child healed spontaneously. Two patients (1.7%) underwent treatment with interlesional meglomine antimonate therapy weekly until recovery. Meglomine antimonate was well tolerated without any side effects.

Follow-up records were available for 93 (79.5%) patients. All leishmaniasis lesion healed within an average period of 2-14 month. Hyperpigmented scars were in 25.6 percent of the patients, atrophic scars in 4.3% and hypopigmented scars in 3.4%.

**DISCUSSION**

This study reports on cases of cutaneous leishmaniasis in children from different regions in southeast of Kashan. The prevalence rate obtained 7.2%
in this study that seems to be rather high and could reflect the occurrence of an almost severe outbreak of CL in this area. Clustering of cases was recorded in different areas along the Kashan and Aran-Bidgol with the highest number of cases in the Abouzeidabad. Other studies have been reported on the cutaneous leishmaniasis on both sides of Kashan and Aran-Bidgol (Yaghoobi, 2001, 2004, 2003).

The highest infection rates recorded in males (54.7%) compared to females (45.3%) in all age groups (Table 3) were also reported by others (Alimohammadiana et al., 1999). Significant differences were observed between infected males and females (p<0.05).

The $\chi^2$ test also showed significant differences of host age on scar/lesion rates (p<0.05). This difference might be explained by more exposure of the males to the sandflies bites during their travel and work activities in the endemic areas (Kharfi et al., 2005).

Considering the fact that about 48.7 percent of patients had one or more than one skin lesions (Table 1), we conclude that sandfly bites the host more than one time and from every area of bite, parasite enter the blood (Ahmadiyazdi et al., 2004; Yaghoobi, 2002; Ajdary et al., 2000).

Phlebotomus longipes can not bite over the clothing and they attack to the exposed areas of the body to suck the blood, so the lesions mainly appear in the hands, face and legs (Nadim et al., 1971).

Customs and geographic location of Kashan, presence of contaminated centers in Badrood and Ardestan and traverse of susceptible hosts especially the migration of Afghans to these areas are most important factors in expansive the disease (Salimi, 2000; Juvadian et al., 1967).

In present study the prevalence of Leishmaniasis was equal in countryside of Kashan and Aran-Bidgol and the rate of disease is being increase in both area, especially, childhood leishmaniasis was frequent and affects mostly school-age children with a history of stay in this area. Even infants can be affected. Most of our patients were living the southeast of Kashan, which may be associated with the geographical situation of Isfahan (Hanafi et al., 2002).

Cutaneous leishmaniasis lesions can be misdiagnosed, especially in children, with impetigo, prurigo and folliculitis. Diagnosis is easily confirmed by the parasitology smear but in endemic areas the diagnosis is established on clinical examination (Berman, 1997).

The study used intramuscular meglumine antimonate in case of resistance to local treatment, multiplicity of the lesions (over 5) and proximity to cartilage and joint, location on the leg and foot.

Our patients received 20-30 mg kg$^{-1}$ day with no side effects. Some authors reported success of using 10 mg kg$^{-1}$ day in children in order to prevent cardiac side effects (Selim et al., 1990; Talari and Sadr, 2005; Talari et al., 1999; Sadr and Talari, 1998).

The standard of therapy for multiple lesions remains intramuscular meglumine antimonate using a protocol based on intramuscular injection per day for two weeks. This regimen has led to satisfactory results in patients but further prospective studies are needed.

In conclusion, childhood cutaneous leishmaniasis was frequent in our study. It had the characteristic of endemic leishmaniasis. The prevalence of leishmaniasis was high in countryside of Kashan and Aran-Bidgol and the rate of disease is being increase in both area.

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REFERENCES


