

## THE FREQUENCY OF OLD WORLD CUTANEOUS LEISHMANIASIS IN SKIN ULCERS IN PESHAWAR

Saeedur Rahman, Fatima Humera Abdullah\*, Jamshaid Ali Khan\*\*

Department of Pathology, Khyber Girls Medical College, \*Hayatabad Medical Complex,

\*\*Department of Pharmacy, University of Peshawar, Peshawar, Pakistan

**Background:** Old World Cutaneous Leishmaniasis (OWCL) is a preventable skin infection that leads to morbidity and social isolation. It is spreading rapidly. The sore of OWCL may be a non-ulcerative red papule, nodule or a large mutilating ulcer. The ulcer is typically painless and can leave a disfiguring scar. **Methods:** This was a descriptive study. The diagnosis of OWCL was established by finding LD bodies in skin smear preparation. **Results:** This study identified 1680 cutaneous leishmaniasis in 1767 skin ulcers. Children (n=924) were infected more than other age groups (n=756). There were typical skin sore of OWCL in 1512 cases while 168 patients had atypical presentation. The ulcers were painless in 1603 patients. History of insect bite was present in 1366 cases, thorn prick in 156 patients, religious visit to endemic areas in 256 patients, and 4 patients had post surgical non healing wound. Lesions with 4 to 6 months of age had a maximum yield of LD bodies. There were 498 patients from different areas of Peshawar; 688 cases from leishmania endemic belt of FATA while 89 patients came from other urban and rural areas of NWFP. **Conclusions:** There is a tremendous increase in cases of OWCL and the disease became endemic in many regions of Pakistan. The bordering areas along Afghanistan have constituted an endemic belt that had invaded the neighboring urban and rural areas. Several chronic non healing ulcers had been diagnosed as OWCL. Many cases have been detected in Peshawar. People need education about the nature of the diseases and the efficacy of personal protective measures. Spray with suitable insecticides is required in all residential areas.

**Keywords:** Leishmaniasis, sand flies, amastigote, non-healing ulcers, disfiguring scar

### INTRODUCTION

Leishmaniasis is a protozoal infection of the tropical and subtropical regions of the world.<sup>1,2</sup> It is transmitted and spread by the bite of infected sand flies.<sup>3,4</sup> Leishmaniasis is one of the ancient diseases in human that can be traced back to the first century AD.<sup>4</sup> The disease has many synonyms.<sup>1</sup> Leishmania was first described by Leishman and Donovan in 1903 working separately.<sup>5</sup> Cutaneous and visceral leishmaniasis are the common forms present in Asia.

Cutaneous leishmaniasis is confined to the skin.<sup>1</sup> It is associated with rural areas and poverty, but it has adapted to the urban environment as well.<sup>6</sup> There is an estimated 185 million people at risk for cutaneous leishmaniasis in 61 countries.<sup>7</sup> The old world cutaneous leishmaniasis (OWCL) was not common in Pakistan before the influx of Afghan refugees. Now it is endemic in many regions of Pakistan and is spreading rapidly<sup>8,9</sup>, specially in the refugee camps where the transmission is usually anthroponotic, i.e., humans being are reservoirs of the disease<sup>10-12</sup>. The rare forms of the disease; the diffuse cutaneous and mucocutaneous leishmaniasis are not present in Pakistan.

Clinically, the lesion of OWCL is seen in two forms, a dry, urban sore, caused by *L. tropica* and early ulcerative, moist, rural sore caused by *L. major*.<sup>1,13</sup>

The clinical presentation of cutaneous leishmaniasis has a great diversity, new and rare variants are being reported.<sup>8,14</sup> Depending upon the species of the parasite and immune status of the host, there are many

presentations of cutaneous leishmaniasis, from a non-ulcerative red papule to a large mutilating ulcer.<sup>1,15,16</sup> It can present as a hard indurated plaque, nodule, scabby papule, or warty tumor-like lesion.<sup>1</sup>

The ulcer can leave a disfiguring scar. Another rare presentation is the persistence of drug resistant, non healing ulcer. Some patients suffer from reactivation of the healed scar.<sup>15</sup> Secondary bacterial or fungal infection of the ulcers leads to more tissue destruction and disfiguring of the skin.<sup>6,17</sup>

Leishmaniasis is prevalent within and along the borders of Afghanistan, India, Islamic Republic of Iran and Pakistan. Cutaneous leishmaniasis is a preventable infection that is endemic in many regions of Pakistan.<sup>4,9</sup> It is not a cause of mortality but can cause morbidity and social isolation due to its disfiguring complications. Many studies have been conducted in Pakistan; the focus usually is the magnitude and type of the infection. A comprehensive need assessment is required to devise public health strategies for an effective prevention of this rapidly spreading infection, particularly in the NWFP. This study was designed to accomplish the purpose.

Observing the gravity of the situation where many cases of skin ulcers and non-healing wounds were diagnosed as cutaneous leishmaniasis in the local Pakistani community; the present study was designed. The aim was to identify and characterize the skin sores of cutaneous leishmania in patients referred to Hayatabad Medical Complex, Peshawar. This would help to provide a baseline to design and

recommend strategies for the control of cutaneous leishmaniasis in the community and national policy making levels in Pakistan.

## MATERIAL AND METHODS

This study was a hospital based descriptive study conducted at Hayatabad Medical Complex, Peshawar, from Jan 2006 to Oct 2008. Patients with typical sore of OWCL, chronic ulcers, non-healing wounds and post treatment follow up cases were included in the study.

Patient data and characteristics of the lesion were noted. Relevant clinical information was recorded. Specimens from lesion were collected under strict aseptic precautions to avoid infection. The wound was gently pinched between two fingers to make the area blood less. A small nick was made with blood lancet or 25 number surgical blades at the raised or swollen edges. Blood was wiped and three slides were prepared from tissue extract from the wound and base of the ulcer. The slides were fixed with methanol for 2 minutes, stained with Giemsa stain and examined by direct microscopy with oil immersion lense.

Diagnosis of OWCL was made when amastigotes of leishmania were found extracellularly or in monocytes (macrophages). Slides were examined thoroughly before they were called as negative.

## RESULTS

This study included 1680 cases of old world cutaneous leishmaniasis (OWCL) diagnosed in skin ulcers among 1767 patients referred to Microbiology Laboratory of Hayatabad Medical Complex, Peshawar, Pakistan. These included 196 cases in 2006, 745 cases in 2007, while 739 cases in 2008.

The frequency of OWCL in boys was 672 (40%) while in girls was 252 (15%). The frequency in other age groups in male patients was 453 (27%), while in female patients was 303 (18%).

In the study population 1512 patients had a typical presentation of OWCL, while in 168 patients the ulcers had atypical presentation (Figure-1,2).

Thirteen of the cases had small red papule (abortive type; Figure-3), 138 cases had monorecidive relapsing lesion, and 178 patients had disseminated ulcers. There was no case of diffuse muco-cutaneous leishmaniasis. The ulcers were painless in 1603 patients.

History of thorn prick was present in 156 patients, insect bite in 1366 patients, religious visit to endemic areas was present in 156 patients, incision and drainage of abscess in one patient and 3 patients had post surgical non healing wounds.

Clinically, the ulcer was dry urban sore in 1344 patients, and moist rural oriental sore in 336 cases. The skin sore was secondarily infected with bacteria or yeast in 77 patients.

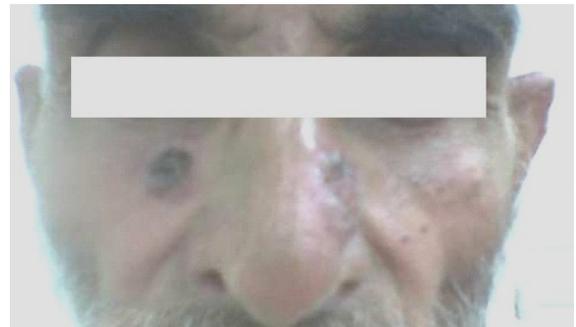
Multiple lesions were present in 302 cases, 756 had the ulcers with raised edges and central crater, 84 patients had crusty lesions with satellite papules, and in 504 patients the ulcers were covered with scab.

The age of the sore was less than one month in 218 cases. It was 1–4 months in 437 patients, >4–6 months in 638 patients, >6 months to one year in 252 patients, and in 135 patients the sores were persistent for more than one year.

The demographic situation of OWCL in the North West frontier Province was found as shown in Table-1.



**Figure-1: A non-healing lesion on right foot of a diabetic female for 2 years—An atypical presentation of cutaneous leishmaniasis.**



**Figure-2: This presentation of OWCL could easily be mistaken as Basal Cell Carcinoma (BCC).**



**Figure-3: Abortive lesion of OWCL on upper eye lid. It required a great care during intra-lesional antimony injections!**

**Table-1: Demographic frequency of study population**

Area of Residence of patients	Number	(%)
Local residents of Peshawar	296	17.6
Endemic belt residing in Peshawar	202	12
Endemic regions of NWFP	688	41
Other non-endemic regions of NWFP	89	5.3
Afghan refugees from the refugee camps in NWFP	370	22
Patients from Afghanistan	35	2.1

**DISCUSSION**

Old world cutaneous leishmaniasis (OWCL) is much more prevalent than had been appreciated. Afghanistan and Iran are amongst the high incident countries for cutaneous leishmaniasis.<sup>4</sup>

The leishmaniasis was not a common disease in Pakistan some years before. The environmental, climate, housing, sanitation and socioeconomic conditions favored the existence of sandflies in almost all parts of Pakistan. The influx of reservoir hosts might lead to eruption of an endemic situation in many regions of NWFP, Balochistan, Kashmir, Punjab and Sind especially in refugee camps.<sup>10</sup> The disease has invaded the neighboring urban and rural areas, and acquired resistance to available treatment in many cases. Every one living in the endemic region might be at risk.

This study identified a tremendous and escalating increase in cases of OWCL. There were 196 cases identified in 2006, 745 cases in 2007, while 739 patients were identified in a period from January to October 2008. Children (55%) were infected more than other age groups (45%). This is consistent with the observation of Ajdary, 2000.<sup>15</sup>

In the study population of OWCL 90% patients had typical sore of the disease which was confirmed with skin scrap testing. The ulcer had raised edges (55%), crusty lesion with satellite papules (5%), covered with scab (30%) and mostly (97%) painless. Painful ulcers due to secondary bacterial or yeast infection was present in 5% of the patients. An extensive search for LD bodies in the lesional skin smears was necessary; especially in infected wounds that was a tedious & tiresome job. In some infected cases when the wounds were suggestive of OWCL, antibacterial and anti-yeast were administered for a week or so when the smear became positive for LD bodies.

The dry urban sore (80 %) was predominant in the study population. Human is the main reservoir of infection<sup>1</sup>, while 20% cases were wet rural ulcer.

The yield of LD bodies in skin smears was found maximum (64%) if the duration of wound was from one month to 6 months. Skin papule in patients from endemic areas also had a maximum yield of the LD bodies. This study identified 688 cases of OWCL from endemic belt along the borders of Afghanistan,

i.e., Khar, Bajore Agency, Bara, Kurram Agency, Miranshah and South Waziristan. This endemic belt of OWCL has invaded the urban suburbs of Bara Road, Mattani, Zangalai, Cherat, and some villages of Nowshera, and Mardan.

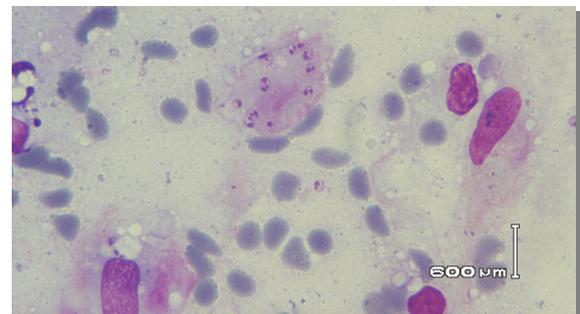
The current study identified an epidemic situation of OWCL in Peshawar city and Hayatabad. There were 498 patients of cutaneous leishmaniasis from Hayatabad (Phases 1–7), Regi village, Board area, University of Peshawar and its residential premises, Tehkal, Peshawar City, surrounding areas and the near villages. Cases are also found from Peshawar Cantonment. In few cases more than one persons of a family residing in a house had the lesion of OWCL.

There were 370 cases identified as OWCL from different Afghan Refugees camps. These cases might have constituted the reservoirs of the disease in Pakistan. Thirty five patients came from Afghanistan for treatment. There were 89 sporadic cases from non-endemic areas of NWFP like villages of Lakki Marwat, Karak and Kohat.

The history of religious visit to Quetta and Balochistan was present in 256 patients with non-healing chronic ulcers. They acquired the infection in the endemic regions probably while stayed in mosques and slept on ground.

Four patients acquired non-healing ulcer of OWCL in Gulf countries, i.e., two in Saudi Arabia, one each in Kuwait and Muscat during their job and stay in deserts. The sores were mostly painless (n=1603), unless secondary bacterial or yeast infection was there (n=77).

For the diagnosis of OWCL, the amastigotes of leishmania were identified in skin scrap smears. It required a thorough examination of slides. LD bodies could be found in different shapes, i.e., lanceolate, oblong, rod shaped, rounded, small and large. They had to be differentiated from platelets or other artifacts (Figure-4).



**Figure-4: The typical presentation of amastigotes of OWCL (LD bodies) in a smear preparation, stained with Giemsa. There is a distinct kinetoplast and nucleus surrounded by cell membrane.**

## CONCLUSIONS

1. This study indicated endemic belt along the borders of Afghanistan that has invaded and spread into many urban regions of NWFP probably because of the free movement of patients.
2. An epidemic like situation of OWCL has erupted in Peshawar and suburb.
3. Chronic non-healing ulcers must be evaluated for OWCL
4. This study emphasised on the extensive search for the cases of OWCL, their proper treatment and follow through. It also required devising public health strategies for an effective prevention of this rapidly spreading infection.

## RECOMMENDATIONS

Community must be educated regarding use of personal protective measures, the application of insect repellents on the exposed skin and the enhancement of vector-control activities in the endemic areas by

1. Improving the living conditions, clearing refuse around the building and installation of fine mesh on doors and windows.
2. Eliminating the reservoirs and all microfoci should be sprayed with suitable insecticides, i.e., DDT, hexachlorocyclohexane (HCH) or melathion.
3. Supplementary protection with insect repellents & permethrin-impregnated bed nets.

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## Address for Correspondance:

**Dr. Saeedur Rahman**, Associate Professor Pathology, Khyber Girls Medical College, Peshawar, Pakistan.

**Cell:** +92-300-5997379

**Email:** saeed\_rhn@hotmail.com