Journal of Pakistan Association of Dermatologists. 2021;**31(4)**:716-719.

Case Report

Treatment of multiple cutaneous leishmaniasis lesions in diabetic patient with photodynamic therapy

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Abstract Cutaneous leishmaniasis (CL) is the most common type of leishmaniasis. It is originated by different species of the protozoan parasite leishmania, transmitted by infected female sand flies. Although CL is not life-threatening, still may leave quite disfiguring and ugly scars on infected areas. In this case report, we detail the case of a sixty-five-year-old diabetic male patient with CL, associated with multiple chronic disfiguring ulcers on foot, ear, leg and arm. The patient was successfully treated with methyl amino levulinate based photodynamic therapy (PDT) and after 5 sessions, complete response was achieved. The patient was followed with excellent cosmetic outcome, with no recurrence throughout the observation time and no complication was observed. This study demonstrates the promising role of PDT in the treatment of CL. We have formulated photosensitizer through our institute developed protocol, which increase its efficacy and bring down the medicine cost from US$ 500 to US$ 50.

Key words
Cutaneous leishmaniasis, photodynamic therapy, Type II Diabetes.

Introduction

Leishmaniasis is a vector borne disease; transmitted among mammalian hosts by female sand flies, primarily affecting the skin.[1] There are many animal species that can carry leishmania parasite including rodents, dogs and foxes. Rarely leishmanisis can be passed from person to person through blood transfusion, infected needles and syringes or congenitally from mother to baby.[2-5] It is among the six most important diseases in terms of its impact on public health. WHO estimates 1 to1.5 million Cutaneous Leishmaniasis (CL) new cases every year.[1,6] CL is the most common type leishmaniasis characterized by sores on the skin, which usually develop within a week or few months after the bite of sand-fly but leaving quite disfiguring and ugly scars. Though the disease by itself is rarely fatal but carries a significant social and political impact.[1] PDT is a new and rapidly evolving therapeutic option and its FDA approved indications are including actinic keratosis, basal cell carcinoma, and superficial squamous cell carcinoma.[7] Inflammatory skin diseases, such as psoriasis, acne vulgaris, and sarcoidosis are the off label uses of PDT. Moreover PDT also have a role in infectious skin diseases, including verruca vulgaris, condylomaacuminatum, and CL.[8,9] There are number of studies indicating successful application of PDT in the treatment of CL.[10] Here we present the case of pentavalentantimoniate resistant CL treated with photodynamic therapy at Swat Institute of

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Case report

A 65-year-old diabetic male patient was referred by skin specialist to SINOR, Swat for photodynamic therapy. It was a biopsy proven case of CL with multiple chronic disfiguring ulcers on foot, ear, leg, and arm as shown in **Figure 1**. The patient had received conventional injectable and oral therapy for CL for the last 3 months. He did not respond to conventional therapy as disease developed resistance to it. The patient was recommended for PDT after written and informed consent. Fasting blood glucose level was 400mg/ dl at the time of first PDT session. The lesion and the adjacent skin were cleaned and scrubbed to remove the necrotic layer and exudates were dried up. The lesions were 4cm, 5cm, 4cm, 3 cm and 5 cm in diameter. Laser dose and duration was calculated with the help of PDT dosimetry sheet. Locally prepared photosensitizer creams were applied on the affected areas under adhesive covering for an incubation period of 3 hrs. After this period the cream was removed and the area was washed with normal saline.

The lesions were irradiated by red laser light having energy density (75 J/ cm^2) and wavelength λ=635nm according to the institutional protocol. PDT was repeated at one week's interval while rest of cycles after one month gap. PDT outcomes were evaluated through clinical examination and evaluation of inflammation was judged by erythema and swelling, size of lesion and digital photography. After 5 sessions complete response was achieved as shown in the **Figure 2**. The patient was followed at SINOR for 17 months with excellent cosmetic outcome with no recurrence throughout the observation time and no complication was observed.

Discussion

It is reported that CL cases are rising in rural areas of Pakistan. Limited work has been made for prevention and treatment due to poverty and inadequate medical facilities.[11] In the field of medicine negligible advancement has been done

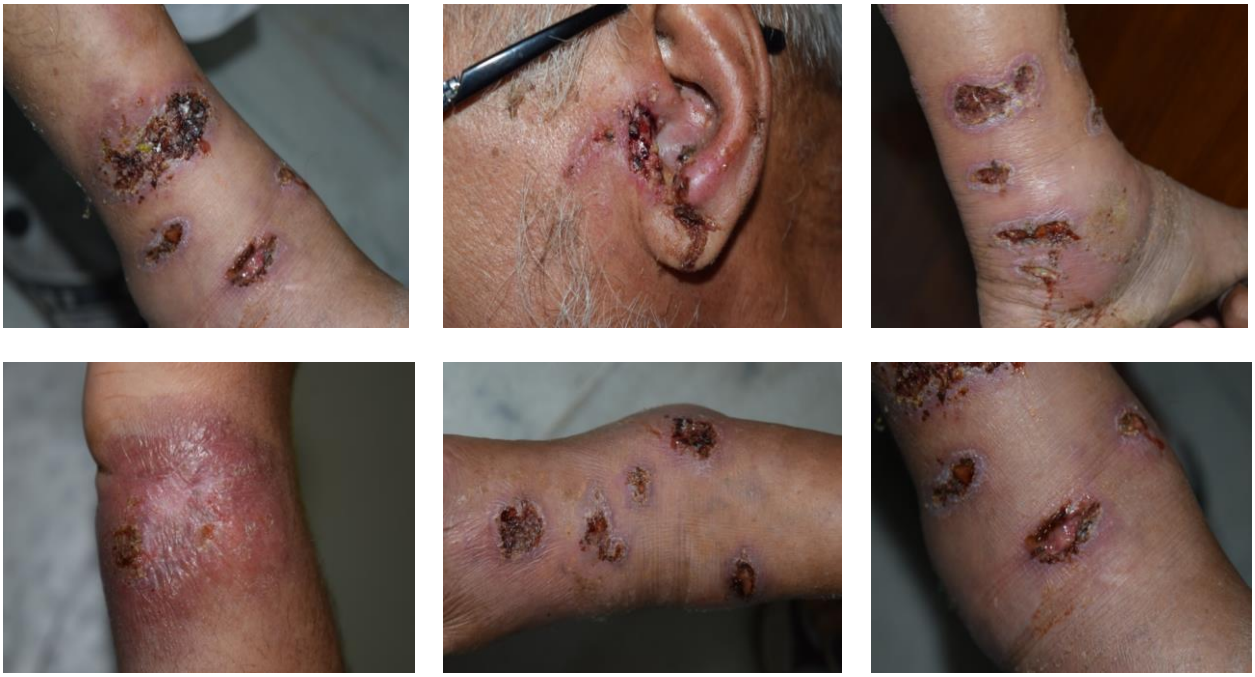

Figure 1 Images of infected lesions before photodynamic therapy.

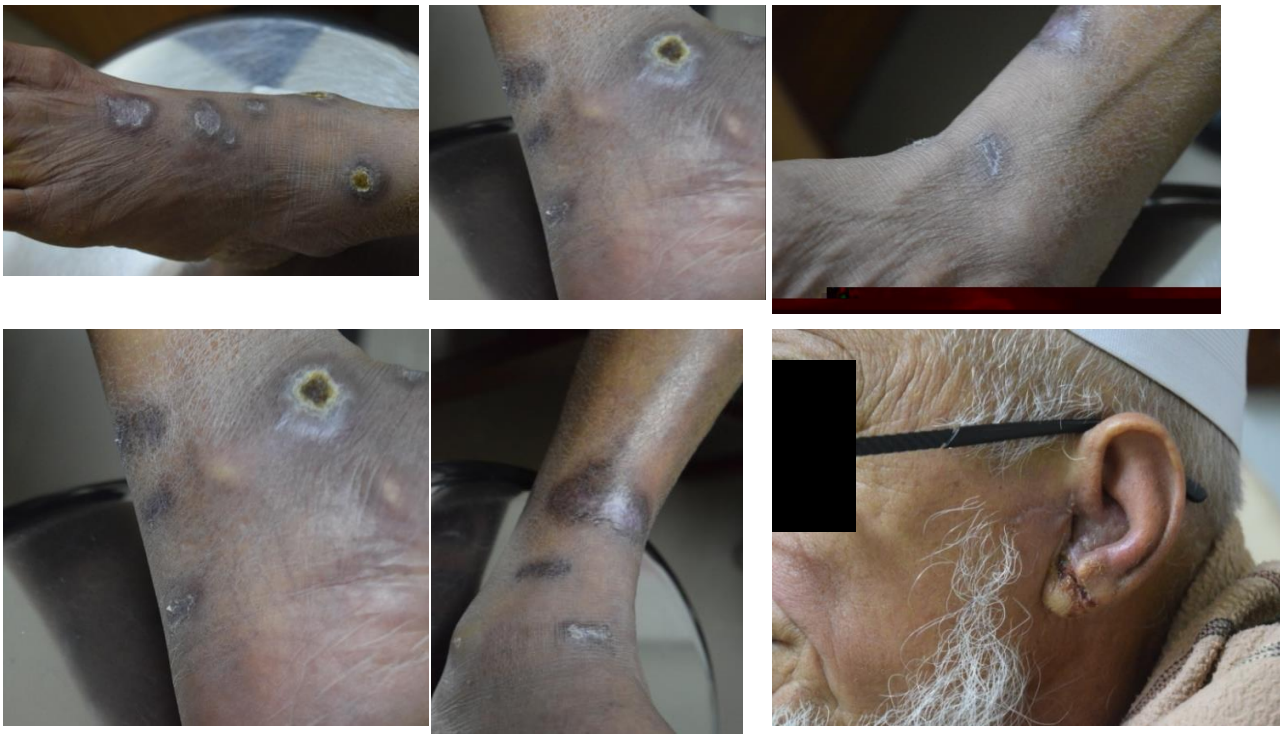

Figure 2 Images of infected lesions after photodynamic therapy.

so far. Conventional pentavalent antimonials is using for more than 90 years Worldwide.[6] Despite high incidence of side effects including renal, hepatic, cardiac diseases, pancreatitis, and discomfort for the patient from daily subcutaneous injections, antimoniate still remain the first drug of choice.[12] Apart from potential systemic toxicities these medicines have limited success of complete response rates. The limited availability of the medicine is causing some resistance to the treatment as well. Leishmania species are developing resistance to these drugs.[13,14] Further the toxicity profile of these medications is also well documented.[15] These drugs should be administered under medical supervision, which is a considerable burden on impoverished patients and their families.[6] New therapy which allows lower costs, lower side effects and high efficacy are urgently needed. PDT offers the best solution to the problem.[14] It has further reduced the healing time as the treatment does not involve systemic involvement there is no known side effects except for a tolerable and manageable burning pain only during application of laser.[16] PDT has produced some success in treating superficial diseases and approval of protoporphyrin has an open new window to search for new photosensitizer. The main limitation of PDT is the unavailability and high cost of light source and photosensitizer,[16] but in our study we have formulated photosensitizer through our institute developed protocol, which increase its efficacy and bring down the medicine cost from US$ 500 to US$ 50.

Conclusion

PDT offers a good solution to treat CL with short duration of treatment and excellent cosmetic outcomes. The main advantage of institute based formulation of photosensitizer is low cost and makes it possible in the treatment of CL Antimoniate resistant cases.

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