

Report

Post kala azar dermal leishmaniasis in Sudan

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SUMMARY Post kala azar dermal leishmaniasis (PKDL) is a condition that develops after treatment of kala azar. We report on 42 patients with suspected PKDL, 40% of whom were children. Diagnosis was made through investigation of family history of kala azar, clinical examination and the use of laboratory investigations, such as skin smear, skin biopsy, bone marrow aspiration and the leishmanin skin test. Regarding the lesions, 24 patients (57%) had papular lesions, 10 (24%) had hypopigmented maculopapular lesions and 8 (19%) had nodular lesions. The lesions of PKDL may be confused with other dermatological diseases and therefore it is important that clinicians and pathologists collaborate in diagnosing such cases.

Introduction

The leishmaniasis are a group of diseases caused by protozoal parasites of the genus *Leishmania*. These parasites were discovered by Leishman and Donovan in 1903 and belong to the family of *Trypanosomatidae* [1]. The species has been classified according to geographical location into *L. donovani*, found in Asia and Africa and *L. infantum*, found in Europe. On the basis of clinical and morphological characteristics there are six principal forms: *L. tropica*, *L. aethiopiana*, *L. donovani*, *L. braziliensis*, *L. infantum* and *L. chagasi* [1].

Species distinguished on clinical grounds are morphologically the same, however, differences exist in serology and in growth requirements for culture. Substantial biological variation occurs among the many strains that make up these groups. *L. tropica* causes oriental sore or cutaneous leishmaniasis of the Old World;

L. braziliensis causes mucocutaneous leishmaniasis of the New World; and *L. donovani* causes visceral leishmaniasis (Dumdum fever, or kala azar) [2].

The annual global incidence of visceral leishmaniasis is 1–1.5 million cases, the majority occurring in India and Sudan [3]. Post kala azar dermal leishmaniasis (PKDL) is a condition that appears during or after treatment of kala azar [2]. In Kenya, PKDL has been reported to occur within 12 months of treatment of visceral leishmaniasis [4]. Zijlstra and El-Hassan in their study in Um-Safala (Sudan) found that 65% of kala azar patients developed PKDL, especially young children [5].

The pathogenesis of PKDL is obscure and there is no information about the association of PKDL with particular zymodeme patterns. In India, *Leishmania* isolated from PKDL patients were found to have mini-circle DNA which was absent from patients with kala azar [6].

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Methods

In all, 42 patients were included in this study; 29 patients were from the kala azar ward of Soba hospital. 6 from the tropical medicine hospital in Omdurman, 2 from the military hospital, and 5 patients were seen in the Dermatology Department of the Khartoum teaching hospital.

All patients were asked about any past history of dermatological diseases, kala azar, or any family history of kala azar. A general clinical examination was performed. A skin smear, skin biopsy, bone marrow aspiration and leishmanin skin test (as described by Sokal, 1975) [7] were done.

Results

The majority of patients (64%) were male and 36% were female. Children constituted 40% of patients; their ages ranged from 3 years to 15 years. Lesions developed 6–12 months after treatment for kala azar. However, one child developed PKDL 2 years after finishing kala azar treatment.

Regarding the lesions, 24 patients (57%) had papular lesions, 10 patients (24%) had hypopigmented maculopapular lesions and 8 patients (19%) had nodular lesions. Clinically, the spleen was palpable in 24 patients (57%) and the liver was enlarged in only 10 patients (24%). Enlarged cervical, inguinal, epitrochlear and axillary lymph nodes were seen in 30% of the patients. The results of skin smear (determination of the parasites in skin lesions), leishmanin skin test and bone marrow aspiration are shown in Table 1. Table 2 shows the affected sites in the patients.

Discussion

The pathogenesis of PKDL is obscure and the literature on it is scant. It is recognized that PKDL is a complication of kala azar, or an inappropriate immune response in the skin following kala azar after elimination of the parasite from viscera. Factors involved in its pathogenesis may relate to the parasite and the host. The appearance of the lesions in areas exposed to the sun suggests that ultraviolet radiation may play an important role in the pathogenesis of PKDL. Genetic factors may also play some part [8]. In areas where kala azar is caused by *L. donovani*, PKDL has been reported with a variable frequency [4,9,10] or to an unknown extent [11].

It has been suggested that PKDL cases may act as a human reservoir of *Leishmania* parasites, but to what extent is unknown. There is no convincing evidence of an animal reservoir for kala azar in Sudan; only a small number of animals are found naturally infected with *L. donovani*. Obviously, the identification of the reservoir has important implications for the control strategy and there is a need to investigate animal or human reservoirs more thoroughly [5].

PKDL develops 1–5 years after the apparent cure of visceral leishmaniasis with sodium stibogluconate treatment [12]. Occasionally, PKDL may develop during treatment of kala azar and should then more appropriately be referred to as para-kala azar dermal leishmaniasis.

Our study shows a high prevalence of PKDL in children, with children constituting 40% of patients. Their ages ranged from 3 years to 15 years. Lesions developed 6–12 months after kala azar treatment. This high rate in children may be due to the immaturity of their immune system [5].

Table 1 Results of skin smear, leishmanin skin test and bone marrow aspiration for the 42 patients with post kala azar dermal leishmaniasis

Test	No. of patients	%
<i>Skin smear</i>		
Positive	10	24
Negative	27	64
Not tested	5	12
<i>Leishmanin skin test</i>		
Positive	5	12
Negative	11	26
Not tested	26	62
<i>Bone marrow aspiration</i>		
Positive	2	5
Negative	8	19
Not tested	32	76

PKDL may resemble leprosy clinically and pathologically, but loss of sensation, thickened nerves and other features of leprosy are lacking [12]. The occurrence of neuritis in the lesions of PKDL is another possible source of confusion between leprosy and kala azar [13].

The face is always affected. Skin lesions often appear around the mouth and

then spread to the cheeks, forehead, scalp, ears, neck and upper limbs. In severe cases the papules may increase in size as maculopapular lesions and involve the trunk. Scalp and genitalia are less often affected. In our study maculopapular skin lesions were a common presentation, some of which were hypopigmented macules, which can be confused with vitiligo, pityriasis rosea, taenia versicolor and discoid lupus. Ten (10) of our patients had papular lesions with scattered nodules that resembled acne, lichen planus, chickenpox and neurofibromatosis. Nodular lesions were less common.

As far as investigations are concerned, skin smears for detection of the parasite are helpful in the diagnosis of PKDL. Parasites may be few, but when present in section or smear the diagnosis can be confirmed. The leishmanin skin test was positive in only 5 of the 16 patients (31%) on whom the test was performed. Skin biopsy is also of benefit for the diagnosis of PKDL. In two of our patients, parasites were found in bone marrow aspirate, which indicates that the parasite had not been completely eliminated from the viscera. These patients can be considered as cases of visceral leishmaniasis with para-kala azar dermal leishmaniasis.

It can be concluded that a comprehensive history, clinical examination and the use of simple laboratory investigations, such as skin smear or skin biopsy, may be helpful in reaching a diagnosis. In our study, the type and distribution of lesions and history of kala azar were the main diagnostic criteria, with the demonstration of the parasite in skin lesions confirming the diagnosis.

Papular, macular or maculopapular lesions of PKDL may be confused with leprosy, taenia versicolor, discoid lupus, pityriasis rosea, vitiligo, acne, measles,

Table 2 Sites affected in the 42 patients with post kala azar dermal leishmaniasis

Affected site	No. of patients	%
Face	42	100
Trunk	19	45
Limbs	16	38
Scalp	8	19
Genitalia	3	7
Hands	13	31

chickenpox, lichen planus, neurofibromatosis and seborrheic dermatitis. It is therefore important that clinicians and

pathologists collaborate in diagnosing such cases

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