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Leprosy type 1 reaction (formerly reversal reaction)

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Abstract Nerve damage leading to impairment and permanent disability is the major problem in the course of a leprosy infection. Most of the damage occurs during two types of leprosy reactions, type 1 reaction (T1R) and type 2 reaction (T2R). Timely and adequate treatment may prevent this damage.

Particular T1R reactions, however, are often diagnosed too late and are even missed. Clinical symptoms and warning signs are therefore covered, as are the immunology and pathophysiology of nerve damage. The differences between upgrading and downgrading, old terms but still relevant, are explained. Methods to detect reactions and to monitor their treatment are given. Triggering factors, the mechanisms of the reactions, including autoimmunity, and the presence of physical compression are discussed. Treatment over the years is placed in its context, and based on this information a treatment schedule is recommended.

Introduction

Nerve damage leading to impairment and permanent disability is the major problem in the course of a leprosy infection. Were it not for these, leprosy would be a rather innocuous skin disease. To this day, however, leprosy is still one of the most feared diseases, often associated with serious social repercussions. It has been stated that there is no leprosy without nerve damage.

Nerve damage in leprosy may occur before antimycobacterial treatment, during treatment, and even up to 30 years after treatment in patients who are labeled cured.[1,2] When it occurs during or after treatment, it is frustrating for both the patient and the doctor.

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The most important causes of nerve damage are the acute episodes in the chronic course of the disease, caused by changes in the host immune response against *Mycobacterium leprae* antigenic determinants, known as reactions; there are type 1 leprosy reaction (T1R), or reversal reaction, and type 2 leprosy reaction (T2R), also called erythema nodosum leprosum (ENL). The first occurs in borderline leprosy (BL) patients and the latter in lepromatous patients.[1,2]

Type 1 leprosy reaction

In the past, different names were used for type 1 reaction, leading to disagreement among leprologists. As a result, for quite some time, there was an Anglo-Saxon–French, a Spanish–Portuguese–South American, and an Indian school.[2] At present, a common nomenclature and definition

is used: type 1 leprosy reaction (T1R). The term *reversal reaction (RR)* is discouraged.

A reaction belongs to the normal course of leprosy as a disease; however, treatment may precipitate or prevent it.[3]

Diagnosis of T1R[1,2,4,5]

Skin involvement often accompanies nerve involvement but may also precede or follow nerve damage. It is often the skin involvement that brings the patient to a clinic, or ideally to a dermatologist, although even this does not always guarantee prompt diagnosis and treatment.[6] Clinically, a reaction may be suspected when there is increased inflammation of preexisting skin lesions. Hypopigmented or only slightly erythematous macules become red and swollen, form plaques, and occasionally undergo ulceration (Figure 1).[7,8] Crops of new lesions may suddenly appear in previously clinically uninvolved skin.[1,9,10] Sometimes, extensive edema of the extremities or face may be present, in particular in BL patients (Figure 2).[1]

Patients may complain of a burning, stinging sensation in the skin lesions and verbalize aches and pains in the extremities or in the face and loss of strength and/or sensory perception. They may suddenly start to drop things, or stumble when walking. They also may develop blisters without knowing the cause; however, contrary to patients with T2R, they are not ill.[11]

Some patients with T1R have remarkably few complaints; therefore, detection may be delayed or even missed. To prevent permanent damage, objective clinical parameters are necessary. These consist of mapping (drawing) the lesions, which is tedious but worthwhile, and of careful assessment of nerve function (ie, autonomic, motor, and sensory function). Note whether the hands and feet show atrophy, are sweating, or have new dry areas. The appearance of dry areas or an increase in size of these areas is often a first sign of an incipient reaction (Figure 3). Nerves may become thickened and are tender on palpation (Figure 4).[9,12,13] The Tinel sign may become positive; meaning that tapping on the nerve causes a tingling pain, distally.[13] The facial, ulnar, median, radial, peroneal and tibial nerves should be assessed (Figure 5).

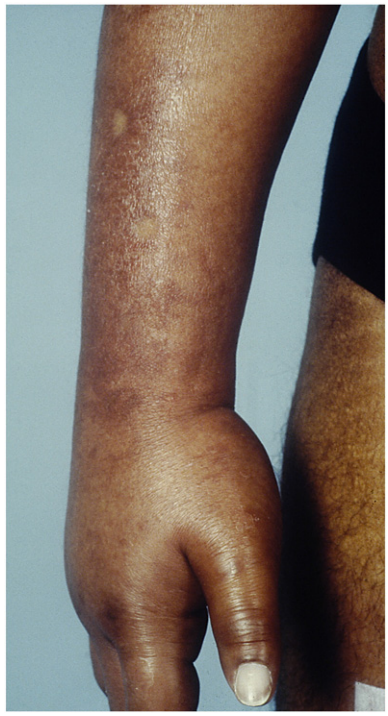

Fig. 2 Acroedema during T1R in a BL patient.

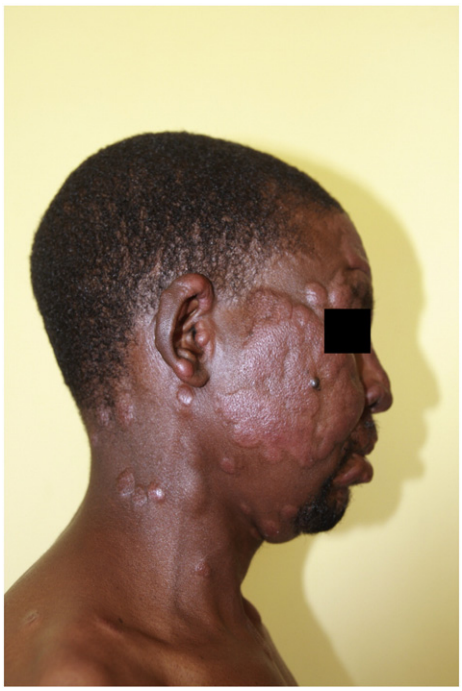

Fig. 1 Facial inflammatory plaques during T1R in a BL patient.

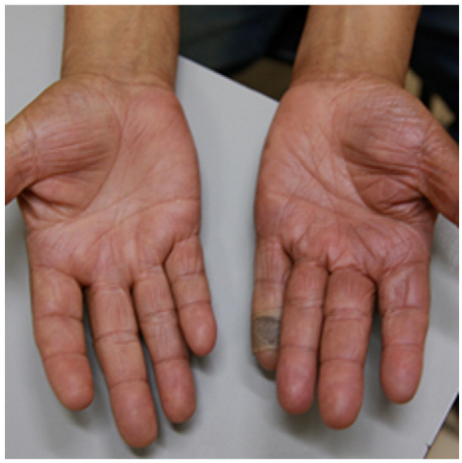

Fig. 3 Dry smooth left hand as early sign of nerve damage.