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Clinical Manifestation, Diagnosis, Treatment and Prevention of Leprosy: An Update

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Abstract

Leprosy, or Hansen's disease, is one of the most common treatable peripheral neuropathies in the world1 It occurs primarily in the developing countries of tropical and subtropical areas. It is most prevalent in India, Brazil, Indonesia, and Nigeria. Owing to emigration mainly from underdeveloped countries, the incidence of leprosy is increasing in the USA. The most common neurologic presentations in leprosy are mononeuropathy, multiple mononeuropathy, and polyneuropathy. The nerves most commonly involved are the ulnar, median, posterior auricular, superficial radial, common peroneal, superficial peroneal, and posterior tibial in that order. Electroneuromyography (ENMG) may be normal or show concomitant involvement of large myelinated fibres, without proprioceptive loss. The two most frequent forms of polyneuropathy that can mimic leprosy are diabetic and amyloid neuropathy. The main aim of treatment is to prevent or arrest nerve damage and to reduce the incidence of deformity. Physiotherapy and rehabilitation are used for impairment and disabilities. Splints and orthoses are provided to correct sensory motor functions and deformities. It seems that corticosteroids when given from the beginning of treatment in large doses for a long time prevent nerve damage. The CGB (Calmette-Guerin Bacilli) vaccine, initially developed to provide protection against TB, also protects against leprosy.

Keywords: *Leprosis; Diagnosis; Treatment*

Leprosy, or Hansen's disease, is one of the most common treatable peripheral neuropathies in the world [1]. It occurs primarily in the developing countries of tropical and subtropical areas. It usually affects the skin, the nerves, the nasal mucosa, and the eyes. The clinical and the pathological findings are influenced by the resistance if the individuals to the bacilli. to the resistance of the patients It is most prevalent in India, Brazil, Indonesia, and Nigeria. Owing to emigration mainly from underdeveloped countries, the incidence of leprosy is increasing in the USA [2].

Leprosy is caused by *Mycobacterium leprae* an intracellular gram-positive alcohol-acid-fast bacillus. It seems that the bacilli initially invades the Schwann cells. The most accepted classification of leprosy is that by Ridley and Jopling (1966) [3] based on clinical, histological, and Immunological criteria subdivided leprosy into the following groups: Tuberculoid (T), Borderline Tuberculoid (BT), Borderline (B), Borderline Lepromatous (BL), and Lepromatous (L) A minor form was added, called in determinate also are known to occur.

Clinical Manifestations

The most common neurologic presentations in leprosy are mononeuropathy, multiple mononeuropathy, and polyneuropathy. The ulnar, median, posterior auricular, superficial radial, common peroneal, superficial peroneal, and posterior tibial are the nerves most involved [4,5]. In most cases the nerves are thickened with painful with palpation. The most enlarged nerve is the ulnar uni or bilaterally (60% of the cases) [6,7]. The cranial nerves may be involved, mainly the trigeminal and the facial [8]. The polyneuropathy in leprosy is not common [8,9]. It's characterized by painful and thermic anaesthesia without weakness in a symmetrical fashion and the tendon reflexes may be normal.

Diagnosis

ENMG may be normal as the main involvement is of small fibres although it may present axonal or demyelinating patterns. In pure neural leprosy (PNL) only the nerve biopsy permits the diagnosis of leprosy [9]. Nerve hypertrophy was present in 94% of patients and the main risk factor for neuropathy was the presence of skin lesions overlying nerve trunks [10]. Some patients may develop inflammatory reactions, due to increased cell-mediated immune response, interrupting the stable and chronic course of the disease. These are the so-t leprosy reactions.

We call relapses when the leprosy manifestations occur after the multiple drug therapy (MDT) treatment. They may be due to inadequate MDT, to misclassification of the disease, to premature stop of MDT, or a poor compliance. When the neurological manifestations occur months or years after the correct treatment, without relapses or reactions we call it late-onset neuropathy. In those cases, there is no activity id leprosy. The patients may have mononeuropathy, multiple mononeuropathy or polyneuropathy. We think that it is probably due to an immune reaction to persistence of ML antigens [11,12].

Detection of antibodies against PGPL-1 may be useful as an additional laboratory test to help diagnose PNL [13]. Recently high-resolution sonography and magnetic resonance imaging of affected nerves have been used to demonstrate nerve enlargement and inflammation in leprosy [14,15].

Differential Diagnosis

The two most frequent forms of polyneuropathy that can mimic leprosy are diabetic and amyloid neuropathy [16]. Diabetes is the most common aetiology of a painful, distal, symmetrical, primarily sensory polyneuropathy with predominant involvement of small fibres. Amyloid neuropathy is another kind of polyneuropathy that can give a clinical picture similar to that of leprosy. Clinical manifestations of dysautonomia occur in diabetic and amyloid polyneuropathy. In hereditary sensory and autonomic neuropathy, sensory loss, especially of pain and thermal sensation, is frequently associated with ulceration of feet, mutilation, and deformation. In these cases, the familial history and the DNA exam may confirm the diagnosis.

Treatment

The main aim of treatment is to prevent or arrest nerve damage and to reduce the incidence of deformity. The MDT for leprosy consists of a combination of three drugs, dapsone, rifampicin and clofazimine, which kills the pathogen and cures the patient. Dapsone may cause a painless axonal neuropathy a mild anaemia, or rarely agranulocytosis [17]. Rifampicin is given once a month. It as a strong bactericide drug. Hepatoxicity may occur but is very rare. Clofazimine is given daily [18]. This is a nontoxic drug. In MB leprosy the standard regimen is: rifampicin 600 mg once a month, dapsone 100 mg daily, and clofazimine 300 mg once a month and 50 mg daily for12 months, although in some patients treatment with these drugs could be necessary for up 24 months [19]. In PB leprosy the standard regimen is: rifampicin 600 mg once a month and dapsone100 mg daily for 6 months Moreover, these regimens show a high frequency of reactional states both during and after treatment [19]. In cases with one to three skin lesions without nerve trunk involvement the MDT of a single dose of rifampicin 600 mg plus oxacillin 400 mg plus minocycline100 mg was equally efficacious [20]. Second line drugs are minocycline as well as fluoroquinolones such as pefloxacin and ofloxacin.

Patients who relapse or are reinfected with *M. leprae* must be treated with a second course of MDT (MB or PB) [21]. In late-onset neuropathy it's necessary to treat with corticosteroids for long time associated or not with immunosuppression [11,12].

Rehabilitation

Physiotherapy and rehabilitation are used for impairment and disabilities. Splints and orthoses are provided to correct sensory motor functions and deformities [22].

Prevention

It seems that corticosteroids when given from the beginning of treatment in large doses for a long time prevent nerve damage [23]. The Calmette-Guerin Bacilli (CGB) vaccine, initially developed to provide protection against TB, also protects against leprosy. A recent study in Brazil showed that vaccination in adults with CGB in adults with CGB showed that vaccination may give good to moderate protection (85% and 54%) against leprosy in persons less than 30 years of age and between 30 and 39 years of age, but no effect in those over 40 years [24]. In another trial, CGB revaccination was administered to randomly selected clusters of school children in Manaus, Brazil: there was no protective effect from a second dose of CGB [25].

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