



Etiology and Classification of Leprosy: Signs and Symptoms

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DESCRIPTION

A long-term infection by the microorganisms *Mycobacterium leprae* or *Mycobacterium lepromatosis* causes leprosy, also known as Hansen's disease (HD). Infection can cause harm to the nerves, respiratory system, skin, and eyes. Due to repeated traumas or infection from undiscovered wounds, this nerve damage may make it difficult for a person to feel pain, which may result in the loss of some of their extremities. Moreover, a person who is infected could have blurry vision and weak muscles. Leprosy symptoms can appear within a year, but for other people, they may take up to 20 years to manifest.

Runny nose, dry scalp, eye issues, skin lesions, muscle weakness, reddish skin, smooth, shiny, diffuse thickening of facial skin, ear, and hand, loss of sensation in fingers and toes, thickening of peripheral nerves, a flat nose from the destruction of nasal cartilage, changes in phonation and other aspects of speech production are typical symptoms occurring in the different types of leprosy. Impotence and testicular atrophy are additional potential side effects.

People can be harmed by leprosy in several ways. Five years is the typical incubation period. Throughout the first year following infection or as late as 20 years later, people may start to experience symptoms. The emergence of pale or pink areas of skin that may be insensitive to pain or warmth is frequently the first observable symptom of leprosy. Nerve issues, such as numbness or discomfort in the hands or feet, can occasionally be present alongside or prior to patches of discoloured skin.

Secondary infections (additional bacterial or viral infections) can cause tissue loss and cartilage absorption, which can shorten and distort fingers and toes. Depending on the type of leprosy a person has, their immune response varies. Leprosy patients who have nerve injury account for 30% of cases. If the necessary treatment is given quickly, the nerve damage sustained can be reversed; however, if it is given later than several months, the damage is irreversible. Nerve damage may result in loss of muscle function, which could result in paralysis. Moreover, it may cause aberrant sensations or numbness, which may result in more infections, ulcerations, and joint deformities.

Leprosy is brought on by the mycobacteria *M. leprae* and *M. lepromatosis*. A fatal case of diffuse lepromatous leprosy was the source of the relatively recently discovered mycobacterium *M. lepromatosis* in 2008. Clinically, *M. lepromatosis* and *M. leprae* are interchangeable terms. *M. leprae* is a rod-shaped, intracellular, aerobic, and acid-fast bacterium. The waxy cell envelope coating typical of the genus *Mycobacterium* covers *M. leprae*. *M. leprae* and *M. lepromatosis* are genetically deficient in the genes required for autonomous growth. Being obligate intracellular pathogens, *M. leprae* and *M. lepromatosis* cannot be produced (cultured) in a lab. According to a rigorous interpretation of Koch's postulates, it is difficult to conclusively identify the bacterial organism because *M. leprae* and *M. lepromatosis* cannot be cultured. It has been able to grow the causative organisms in animals like mice and armadillos, despite the fact that doing so *in vitro* has not yet been possible.

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Received: 01-Mar-2023, Manuscript No. TPMS-23-20026; **Editor assigned:** 06-Mar-2023; Pre QC No. TPMS-23-20026 (PQ); **Reviewed:** 20-Mar-2023, QC No. TPMS-23-20026; **Revised:** 27-Mar-2023, Manuscript No. TPMS-23-20026 (R); **Published:** 03-Apr-2023, DOI: 10.35248/2329-9088.23.11:293.

Citation: Yusaf A (2023) Etiology and Classification of Leprosy: Signs and Symptoms. Trop Med Surg.11:293.

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