Leprosy Disease review

Swapnali S. Dadewad[1], Sangram U. Deshmukh[2], Shaymlila B. Bavage[3], Nandkishor B. Bavage[4]
[1]*B. pharmacy Final Year Student,Latur College Of Pharmacy Hasegaon,Tq-Ausa,Dist-Latur 413512 Maharastra,India*
[2,4]*Department Of Pharmaceutical Chemistry, Latur College Of Pharmacy Hasegaon,Tq-Ausa,Dist-Latur 413512 Maharastra, India*
[3]*Department of Pharmacology & Toxicology, Latur College Of Pharmacy Hasegaon, Tq-Ausa,Dist-Latur 413512 Maharastra, India*

Abstract **- Leprosy, also known as Hansen's disease. Leprosy is chronic infection and caused by Mycobacterium leprae. It is still endemic in many regions of the world and a public health problem in Brazil. a microorganism that has a predilection for the skin and nerves.M. leprae primarily infects Schwann cells in the peripheral nerves leading to nerve damage and the development of disabilities. The mechanism of transmission of leprosy consists of prolonged close contact between susceptible and genetically predisposed individuals and untreated multibacillary patients. Transmission occurs through inhalation of bacilli present in upper airway secretion. The nasal mucosa is the main entry or exit route of M. leprae.**
In the last few decades, particularly with the advent of multidrug therapy (MDT) and the use of anti-inflammatory therapies, there have been substantial improvements in long-term health outcomes for individuals diagnosed with HD. Although the worldwide prevalence of this disease has significantly decreased.

Index Terms **- Epidemiology, Disease transmission, Classification; Clinical diagnosis, Signs and symptoms, treatment.**

INTRODUCTION

Leprosy is a chronic infectious granulomatous infection generally caused by Mycobacterium leprae and Mycobacterium lepromatosis, both of which primarily affects the skin and peripheral nerves. This disease is not highly contagious and through awareness and early medical intervention, significant reduction causing disability in the eyes, hands, and feet is possible. Relapses tend to be rare, but any damage caused by neuropathy is irreversible and may require lifelong care.

Every year around 4,00,000 new cases of leprosy occur in India and India contributes about 80% of the global leprosy case load. The prevalence of leprosy (case load per 1,00,000 population) has come down from 52 per 10,000 in 1981 to 2.4 per 10,000 in July 2004. There is no primary prevention for leprosy. Multidrug therapy is the only intervention available against the disease. As of July 2004, there were about 2,40,000 leprosy cases on record in India. There are thirteen states and union territories in India which have already eliminated leprosy. About 70% of the cases detected in India are paucibacillary which are less or non-infectious. Ever since the start of National Leprosy Eradication Programme in 1983, the number of new cases detected every year has not shown significant change. The most important factor that could have significant impact or prevalence is the coverage of the entire population with adequate MDT service.

HISTORY

Leprosy is an age-old disease, described in the literature of ancient civilizations. Throughout history, people afflicted have often been ostracized by their communities and families.

Although leprosy was managed differently in the past, the first breakthrough occurred in the 1940s with the development of the medicine dapsone. The duration of treatment lasted many years, often a lifetime, making compliance difficult. In the 1950s, resistance of M. leprae to dapsone, the only known anti-leprosy medicine at that time, became widespread. In the early 1960s, rifampicin and clofazimine were discovered and subsequently added to the treatment regimen, which was later labelled as multidrug therapy (MDT). In 1981, WHO recommended MDT. The currently recommended MDT regimen consists of three medicines: dapsone, rifampicin and clofazimine. This treatment lasts six months for pauci-bacillary and 12 months for multi-bacillary cases. MDT kills the pathogen and cures the patient.

Since 1995 WHO has provided MDT free of cost. Free MDT was initially funded by The Nippon Foundation, and since 2000 it is donated through an agreement with Novartis, which has been renewed to cover the period till at least 2025.

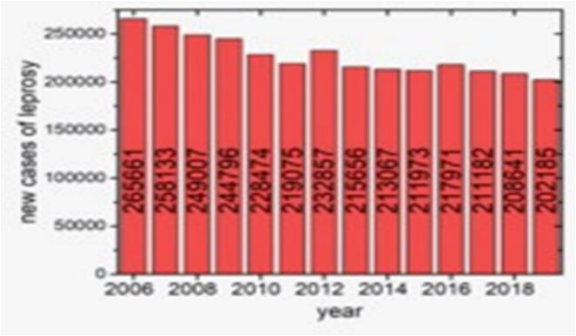
More than 16 million leprosy patients have been treated with MDT over the past 20 years since its introduction. A general reduction in new cases, though gradual, is observed in several countries. the new cases reduced to 202 256 in 2019. Many countries reported only a handful of cases, while 45 countries reported zero new autochthonous leprosy cases.

EPIDEMIOLOGY

In 2000, the World Health Organization (WHO) identified leprosy as completely eradicated. Ultimately, infection elimination was defined as the overall reduction in prevalence to less than 1 case per 10,000 people. In the span from 1985 to 2011, the recorded cases fell from 5.4 million to approximately 219000. By 2011, the prevalence rate in terms of 10,000 people, dropped from approximately 21.1 to 0.37, excluding Europe.

Worldwide, two to three million people are estimated to be permanently disabled because of leprosy. India has the greatest number of cases, with Brazil second and Indonesia third.

In 1999, the world incidence of Hansen's disease was estimated to be 640,000. In 2000, 738,284 new cases were identified. In 2000, the World Health Organization (WHO) listed 91 countries in which Hansen's disease is endemic. India, Myanmar and Nepal contained 70% of cases. India reports over 50% of the world's leprosy cases. In 2002, 763,917 new cases were detected worldwide, and in that year the WHO listed India, Brazil, Madagascar, Mozambique, Tanzania and Nepal as having 90% of Hansen's disease cases. According to recent figures from the WHO, 208,619 new cases of leprosy were reported in 2018 from 127 countries. A total of 16,000 new child cases were detected in 2018.

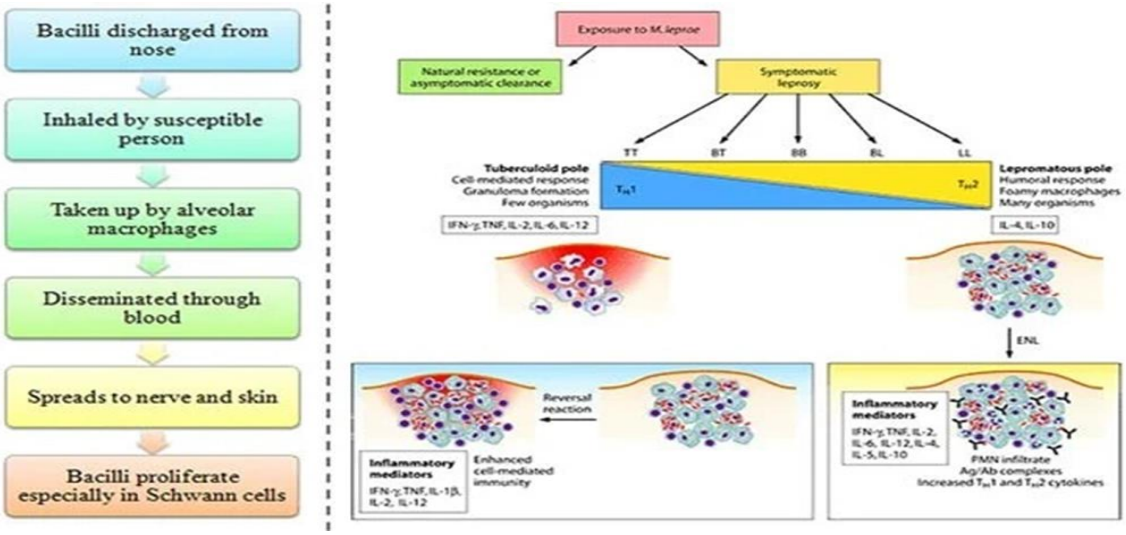


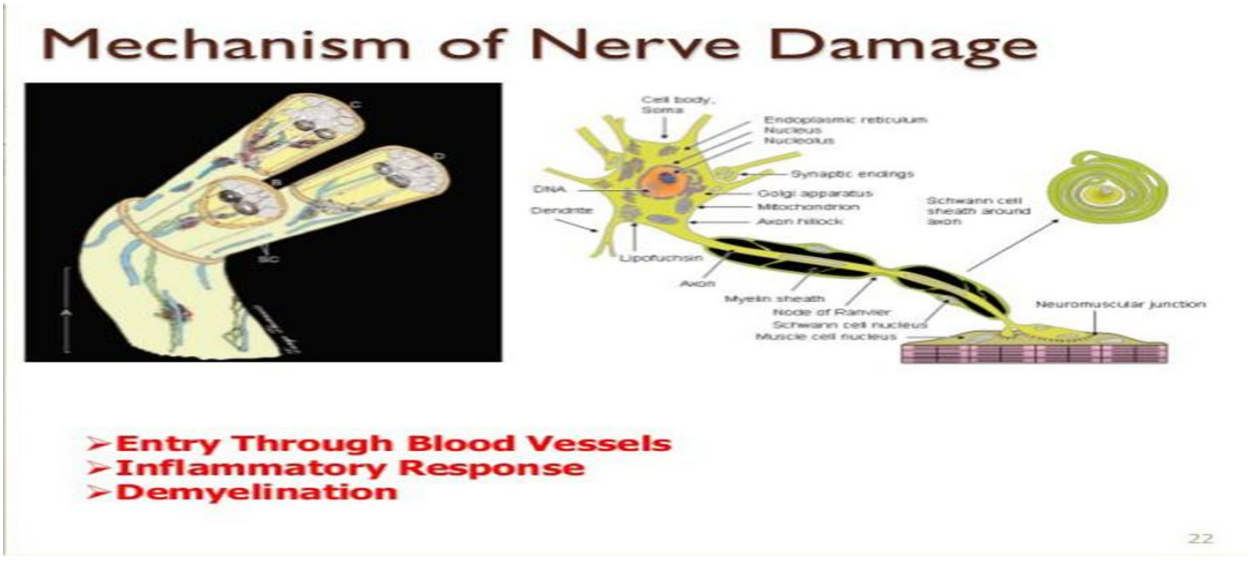
Plot of global new cases of leprosy per year, 2006–2019.

PATHOPHYSIOLOGY

Most leprosy complications are the result of nerve damage. The nerve damage occurs due to direct invasion by the M. leprae bacteria and a person's immune response resulting in inflammation. The

molecular mechanism underlying how M. leprae produces the symptoms of leprosy is not clear,[14] but M. leprae has been shown to bind to Schwann cells, which may lead to nerve injury including demyelination and a loss of nerve function (specifically a loss of axonal conductance).Numerous molecular mechanisms have been associated with this nerve damage including the presence of a laminin-binding protein and the glycoconjugate (PGL-1) on the surface of M. leprae that can bind to laminin on peripheral nerves. In the initial stages, small sensory and autonomic nerve fibers in the skin of a person with leprosy are damaged.[31] This damage usually results in hair loss to the area, a loss of the ability to sweat, and numbness (decreased ability to detect sensations such as temperature and touch). Further peripheral nerve damage may result in skin dryness, more numbness, and muscle weaknesses or paralysis in the area affected. The skin can crack and if the skin injuries are not carefully cared for, there is a risk for a secondary infection that can lead to more severe damage.





Transmission

It is not known exactly how Hansen's disease spreads between people. Scientists currently think it may happen when a person with Hansen's disease coughs or sneezes, and a healthy person breathes in the droplets containing the bacteria. Prolonged, close contact with someone with untreated leprosy over many months is needed to catch the disease.You cannot get leprosy from a casual contact with a person who has Hansen's disease like:

- Shaking hands or hugging
- Sitting next to each other on the bus
- Sitting together at a meal

Hansen's disease is also not passed on from a mother to her unborn baby during pregnancy and it is also not spread through sexual contact.

Due to the slow-growing nature of the bacteria and the long time it takes to develop signs of the disease, it is often very difficult to find the source of infection.

In the southern United States, some armadillos are naturally infected with the bacteria that cause Hansen's disease in people and it may be possible that they can spread it to people. However, the risk is very low and most people who come into contact with armadillos are unlikely to get Hansen's disease.

For general health reasons, avoid contact with armadillos whenever possible. If you had a contact with an armadillo and are worried about getting Hansen's disease, talk to your healthcare provider. Your doctor will follow up with you over time and perform periodic skin examinations to see if you develop the disease. In the unlikely event that you have Hansen's disease, your doctor can help you get treatment.

ETIOLOGY

Dreaded, chronic, poorly transmissible granulomatous disease of the skin and nerves causd by acif fast M. leprae probably least infectious immunity keeps organism at bay in most people humans only natural host but reservoirs

ETIOLOGIC AGENT

The agent that causes Hansen's disease is an acid-fast rod-shaped bacillus Mycobacterium leprae. The organism multiplies very slowly (dividing approximately once every 13 days) and is an obligate intracellular pathogen that lacks several genes needed for independent survival, thus it has never been grown in bacteriologic media. However, it has been grown in mouse foot pads by injecting ground tissue from lepromatous nodules or nasal scrapings from leprosy patients into the foot pad of the animal. Typically, the granuloma appears at the inoculation site within 6 months. Armadillos can also be experimentally infected and will develop systemic disease and are now the most common animal used to study Hansen's disease and its treatment.

CLASSIFICATION

Indian classification-clinicobactriological

madrid classification- clinicobacteriological

ridley jopling classification - immunological

classification by WHO study group on chemotherapy of leprosy- clinicobacteriological

other variants of leprosy

histoid leprosy - varient of LL with better CML usually seen in patients with incomplete chemotherapy or acquired drug resistence. charectarized by presence of spindle shaped histiocytes in tissue section.

Lucio leprosy- mimics myxedema,diffuse non nodular type of leprosy charectarised by melacholy look, thick shiny skin,widespread sensory loss, hoarseness of voice and ulceration of nasal mucosa.

Lazarine leprosy- seesnin association with HIV

TREATMENT

Additionally, several antibiotics treat leprosy by killing the bacteria that causes it. These antibiotics include:

dapsone (Aczone)

rifampin (Rifadin)

clofazimine (Lamprene)

minocycline (Minocin)

ofloxacin (Ocuflux)

Your doctor will likely prescribe more than one antibiotic at the same time.

They may also want you to take an anti-inflammatory medication such as aspirin (Bayer), prednisone (Rayos), or thalidomide (Thalomid). The treatment will last for months and possibly up to 1 to 2 years.

DIAGNOSIS

Your doctor will conduct a physical exam to look for telltale signs and symptoms of the disease. They'll also perform a biopsy in which they remove a small piece of skin or nerve and send it to a laboratory for testing.

Your doctor may also perform a lepromin skin test to determine the form of leprosy. They'll inject a small amount of leprosy-causing bacterium, which has been inactivated, into the skin, typically on the upper forearm.

People who have tuberculoid or borderline tuberculoid leprosy will experience a positive result at the injection site.

SIGN AND SYMPTOMS

The disease can cause skin symptoms such as

Discolored patches of skin, usually flat, that may be numb and look faded (lighter than the skin around)
Growths (nodules) on the skin
Thick, stiff or dry skin
Painless ulcers on the soles of feet
Painless swelling or lumps on the face or earlobes
Loss of eyebrows or eyelashes
Symptoms caused by damage to the nerves are:
Numbness of affected areas of the skin
Muscle weakness or paralysis (especially in the hands and feet)
Enlarged nerves (especially those around the elbow and knee and in the sides of the neck)
Eye problems that may lead to blindness (when facial nerves are affected)

PREVENTION

The best way to prevent leprosy is to avoid long-term, close contact with an untreated person who has the infection.
prevention of leprosy through chemoprophylaxis
use of single dose (SDR) is recommended as preventive treatment for contact of leprosy patients (adults andchildren2 years of age and above). after excluding leprosy and TB disease. and in the absence of other contraindication. post exposure prophylaxis with SDR for all contacts of leprosy cases has been provided under NLEP.
prevention of leprosy through oprophylaxis (vaccines)
BCG vaccination at birth effective at reducing risk of leprosy.
National leprosy eradication program
it is centrally sponsored health program by ministry of health and family welfare. Government of India elimination of leprosy (1 case/10000 population at national level) was already achieved in the year 2005. The short-term target is reduction of rate of grade it disability cases (newly diagnosed leprosy patients with visible deformities) to less than one per million population. as recommended by WHO under global leprosy strategy 2016-2020

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