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Leprosy: A comprehensive overview

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ABSTRACT:

Leprosy, also known as Hansen's disease, is an old but still relevant illness caused by bacteria that mostly affect the skin and nerves. Even though modern medicine can cure it, the disease still exists in some parts of the world, especially in countries with limited health care. This article explains what causes leprosy, how it spreads, its symptoms, how doctors diagnose it, and how it is treated. It also touches on the challenges faced by patients, such as stigma and disability, and the importance of early diagnosis and prevention.

Keywords: Leprosy, Hansen's disease, skin disease, nerve damage, bacterial infection, treatment, public health

Introduction:

Leprosy is one of the oldest diseases known to humans. People have been affected by it for thousands of years. Today, we know that it's caused by bacteria—mainly *Mycobacterium leprae*—which slowly damages the skin and nerves. In severe cases, it can lead to visible deformities and disability.

Thanks to modern medicine, especially the use of antibiotics, leprosy can be cured. However, it hasn't disappeared completely. Every year, new cases are still reported, especially in countries like India, Brazil, and Indonesia. One of the main reasons it continues to exist is the long time it takes for symptoms to appear—sometimes up to 20 years. Because of this delay, many people don't realize they're infected and unknowingly pass it to others.

What Causes Leprosy and How It Spreads:

The Bacteria Behind Leprosy

Leprosy is caused by two kinds of bacteria: *Mycobacterium leprae* and *Mycobacterium lepromatosis*. These bacteria grow very slowly and mainly live inside human cells. They especially like to infect cells in the skin and nerves. Unlike many other bacteria, they can't be grown in a regular lab, which makes studying them a bit tricky.

How People Get Infected

Leprosy spreads through tiny droplets from the nose and mouth when someone who is infected sneezes or coughs. It doesn't spread easily. In fact, most people who come into contact with the bacteria never get sick. Close and long-term contact with someone who has untreated leprosy increases the chances of getting infected. A person's immune system also plays a big role in whether they develop the disease or not.

How the Body Reacts

Not everyone's body reacts to the bacteria in the same way. Some people's immune systems fight off the infection quite well, leading to milder forms of leprosy. Others may not respond strongly enough, allowing the disease to spread. Based on this, doctors group leprosy into different types, ranging from mild to severe.

Symptoms and Types of Leprosy:

Common Signs

The most noticeable signs of leprosy are changes in the skin and nerves. People often notice:

- Light or red patches on the skin that feel numb
- Tingling or loss of feeling in the hands or feet
- Weakness in the muscles
- Thickened or painful nerves
- Eye problems like dryness or even vision loss

If left untreated, these symptoms can get worse and lead to serious complications.

How Doctors Classify Leprosy

To make treatment easier, the World Health Organization (WHO) divides leprosy into two main categories:

- Paucibacillary (PB): This means there are a few skin spots and usually no bacteria seen in tests.
- Multibacillary (MB): This is more serious, with many skin spots and bacteria found in lab samples.

Special Complications Called “Reactions”

Sometimes, people with leprosy experience sudden flare-ups called reactions. These can cause pain, swelling, and fever. There are two main types:

- Type 1 (Reversal reaction): Happens when the immune system suddenly starts fighting the bacteria more strongly.
- Type 2 (Erythema Nodosum Leprosum): A painful condition with red lumps under the skin and fever.

These reactions can damage nerves quickly, so they need urgent care.

How Leprosy Is Diagnosed:

Leprosy is usually diagnosed through a combination of checking the symptoms and doing lab tests. Doctors look for:

- Numb patches on the skin
- Thick or swollen nerves
- Muscle weakness, especially in hands and feet

If needed, doctors may take a small sample from the skin (called a slit-skin smear) or do a biopsy to look under a microscope. Some labs also use DNA tests to detect the bacteria, though this is more common in research centers.

Treatment and Care:

Medicines That Cure Leprosy

The main treatment is called multidrug therapy (MDT). This is a mix of antibiotics that kill the bacteria. WHO provides this treatment for free in many countries. The plan depends on the type of leprosy:

- For PB leprosy: Treatment lasts for 6 months and includes rifampicin and dapsone.
- For MB leprosy: Treatment lasts for 12 months and includes rifampicin, dapsone, and clofazimine.

Managing Reactions and Nerve Damage

When someone has a reaction, doctors often prescribe corticosteroids to reduce swelling and pain. In severe cases, thalidomide may be used, though it's not safe for pregnant women.

Helping People Recover

Even after the bacteria are gone, some people are left with nerve damage or disabilities. Supportive care includes:

- Physiotherapy to keep muscles working
- Proper footwear to protect numb feet
- Surgery in advanced cases to fix deformities
- Counseling to help with mental health and stigma

Where Leprosy Still Exists:

Although leprosy is rare in many parts of the world, it hasn't been completely wiped out. Around 200,000 new cases are reported each year. Most of them come from India, Brazil, and Indonesia.

Even though WHO declared leprosy "eliminated as a public health problem" in many countries, this doesn't mean the disease is gone. In some areas, it still affects communities, especially where people are poor, live in crowded homes, or don't have access to healthcare.

Can Leprosy Be Prevented?

Protecting People Who Are Exposed

One way to prevent leprosy is by giving people who live with a patient a single dose of rifampicin. This can lower their risk of getting sick.

Vaccines

The BCG vaccine, which is used for tuberculosis, offers some protection against leprosy too. Scientists are also working on new vaccines that could be more effective.

Awareness and Monitoring

Teaching people about the disease and checking the health of family members of patients helps find cases early and stop the spread. Long-term success needs good surveillance and community programs.

Conclusion:

Leprosy is not a disease of the past. It still affects people today, especially in poor and underserved communities. The good news is that it can be cured with the right treatment. But the fight against leprosy is not just about medicine—it's also about awareness, compassion, and breaking the stigma.

To end leprosy for good, we need to focus on early detection, proper treatment, and supporting patients beyond just curing the infection. With combined global and local efforts, it's possible to move closer to a world without leprosy.

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