Chapter III

LEPROSY: AN OVERVIEW

3.1 LEPROSY

Leprosy, also known as Hansen's disease (HD), is a chronic infection caused by the bacteria \textit{Mycobacterium leprae} and \textit{Mycobacterium lepromatosis}.\footnote{1} Leprosy takes its name from the Latin word \textit{Lepra}, which means "scaly", while the term "Hansen's Disease" is named after the physician Gerhard Armauer Hansen. It is primarily a granulomatous disease of the peripheral and mucosa of the upper respiratory tract; skin lesions are the primary external sign.\footnote{2} Left untreated, leprosy can be progressive, causing permanent damage to the skin, nerves, limbs and eyes. Contrary to folklore, leprosy does not cause body parts to fall off, although they can become numb or diseased as a result of secondary infections; these occur as a result of the body's defences being compromised by the primary disease.\footnote{3,4} Secondary infections, in turn, can result in tissue loss causing fingers and toes to become shortened and deformed, as cartilage is absorbed into the body.\footnote{5,6,7}

Treatment for multibacillary leprosy consists of rifampicin, dapsone, and clofazimine taken over 12 months.\footnote{7} Single
dose multidrug therapy (MDT) for single lesion leprosy consists of rifampicin, ofloxacin, and minocycline. The move toward single-dose treatment strategies has reduced the rates of disease in some regions. World Leprosy Day was created to draw awareness to those affected by leprosy.

In 1995, the World Health Organization (WHO) estimated that between 2 and 3 million people were permanently disabled because of leprosy at that time. In the past 20 years, 15 million people worldwide have been cured of leprosy.

Leprosy has affected humanity for over 4,000 years, and was recognized in the civilizations of ancient China, Egypt and India. Although the forced quarantine or segregation of patients is unnecessary in places where adequate treatments are available, many leper colonies still remain around the world in countries such as India (where there are still more than 1,000 leper colonies), China, and Japan. Leprosy was once believed to be highly contagious and was treated with mercury—all of which applied to syphilis, which was first described in 1530. It is possible that many early cases thought to be leprosy could actually have been syphilis. The age-old social stigma associated with the advanced form of leprosy lingers in many
areas, and remains a major obstacle to self-reporting and early treatment. Effective treatment first appeared in the late 1940s. Resistance has developed to initial treatment. It was not until the introduction of MDT in the early 1980s that the disease could be diagnosed and treated successfully within the community.\textsuperscript{[7]}

3.2 CAUSES LEPROSY

Leprosy is caused by a slow-growing type of bacteria called \textit{Mycobacterium leprae} (\textit{M. leprae}). Leprosy is also known as Hansen's disease, after the scientist who discovered \textit{M. leprae} in 1873.

3.3 SIGNS AND SYMPTOMS

Hands deformed by leprosy, 1990, India
Leprosy is primarily a granulomatous disease of the peripheral nerves and mucosa of the upper respiratory tract; skin lesions are the primary external sign.[3] Left untreated, leprosy can be progressive, causing permanent damage to the skin, nerves, limbs and eyes. Contrary to folklore, leprosy does not cause body parts to fall off, although they can become numb or diseased as a result of secondary infections; these occur as a result of the body's defences being compromised by the primary disease. Secondary infections, in turn, can result in tissue loss causing fingers and toes to become shortened and deformed, as cartilage is absorbed into the body.
3.4 RISK FACTORS

At highest risk are those living in endemic areas with poor conditions such as inadequate bedding, contaminated water, and insufficient diet, or other diseases that compromise immune function. There appears to be little interaction between HIV and the risk of leprosy.

3.5 TRANSMISSION

Although the mode of transmission of leprosy remains uncertain, many think that M. leprae is usually spread from person to person in nasal droplets. Studies have shown that leprosy can be transmitted to humans by armadillos. Leprosy is not known to be either sexually transmitted or highly infectious after treatment. Approximately 95% of people are naturally immune and sufferers are no longer infectious after as little as two weeks of treatment.

3.6 DIAGNOSIS

Diagnosis in the U.S. is often delayed because healthcare providers are unaware of leprosy and its symptoms. Early diagnosis and treatment prevents nerve involvement, the hallmark of leprosy, and the disability it causes.
There are many kinds of leprosy but there are common symptoms, including: runny nose; dry scalp; eye problems; 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; and flat nose due to destruction of nasal cartilage. There is also phonation and resonance of sound during speech. Often there is atrophy of the testes and impotency.

3.7 PREVENTION

Medications can decrease the risk of those living with people with leprosy from acquiring the disease and likely those with whom people with leprosy come into contact outside the home. There are however concerns of resistance, cost, and disclosure of a person's infection status when doing follow up of contacts, thus the WHO however recommends that people who live in the same household be examined for leprosy and only be treated if symptoms are present.

The Bacillus Calmette–Guérin (BCG) vaccine offers a variable amount of protection against leprosy in addition to tuberculosis. It appears to be 26 to 41% effective (based on controlled trials) and about 60% effective based on observational studies with two doses possibly
working better than one. Development of a more effective vaccine is ongoing as of 2011.

3.8 HISTORY

Evidence of leprosy dates back to ancient Egypt in 4000 BC and was discussed by Hippocrates in 460 BC. The earliest proven human case was verified by DNA taken from the shrouded remains of a man discovered in a tomb next to the Old City of Jerusalem dated by radiocarbon methods to 1-50 AD. The term leprosy is derived from either the Indo-European term *lap*, which means the removal of scales, or the Greek word for "scales", *lepra*. Historical people infected were often confined against their will in leper colonies and in Medieval Europe were required to carry a bell to identify their presence. Attempted treatments have included arsenic, elephants' teeth, creosote, and mercury.

The causative agent of leprosy, *Mycobacterium leprae*, was discovered by G. H. Armauer Hansen in Norway in 1873, making it the first bacterium to be identified as causing disease in humans. The first effective treatment (promin) became available in the 1940s. In the 1950s dapsone was introduced. The search for further effective anti-leprosy drugs led to the use of clofazimine and rifampicin in the 1960s.
and 1970s. Later, Indian scientist Shantaram Yawalkar and his colleagues formulated a combined therapy using rifampicin and dapsone, intended to mitigate bacterial resistance. Multi Drug Therapy combining all three drugs was first recommended by the WHO in 1981. These three anti-leprosy drugs are still used in the standard Multi Drug Therapy regimens.

Since 1995, WHO provides free Multi Drug Therapy for all patients in the world, initially through the drug fund provided by the Nippon Foundation and since 2000, through the Multi Drug Therapy donation provided by Novartis and the Novartis Foundation for Sustainable Development.

3.9 ELIMINATION OF LEPROSY AS A PUBLIC HEALTH PROBLEM

In 1991 WHO's governing body, the World Health Assembly (WHA) passed a resolution to eliminate leprosy by the year 2000. Elimination of leprosy is defined as a prevalence rate of less than 1 case per 10,000 persons. The target was achieved on time and the widespread use of Multi Drug Therapy reduced the disease burden dramatically.
• Over the past 20 years, more than 14 million leprosy patients have been cured, about 4 million since 2000.

• The prevalence rate of the disease has dropped by 90% – from 21.1 per 10 000 inhabitants to less than 1 per 10 000 inhabitants in 2000.

• Dramatic decrease in the global disease burden: from 5.2 million in 1985 to 805 000 in 1995 to 753 000 at the end of 1999 to 181 941 cases at the end of 2011.

• Leprosy has been eliminated from 119 countries out of 122 countries where the disease was considered as a public health problem in 1985.

• So far, there has been no resistance to antileprosy treatment when used as Multi Drug Therapy

• Efforts currently focus on eliminating leprosy at a national level in the remaining endemic countries and at a sub-national level from the others.

### 3.10 ACTIONS AND RESOURCES REQUIRED

In order to reach all patients, leprosy treatment needs to be fully integrated into general health services. Moreover, political
commitment needs to be sustained in countries where leprosy remains a public health problem. Partners in leprosy elimination also need to continue to ensure that human and financial resources are available.

The age-old stigma associated with the disease remains an obstacle to self-reporting and early treatment. The image of leprosy has to be changed at the global, national and local levels. A new environment, in which patients will not hesitate to come forward for diagnosis and treatment at any health facility, must be created.

3.11 WHO RESPONSE

The WHO Strategy for leprosy elimination contains the following:

- ensuring accessible and uninterrupted Multi Drug Therapy services available to all patients through flexible and patient-friendly drug delivery systems;

- ensuring the sustainability of Multi Drug Therapy services by integrating leprosy services into the general health services and building the ability of general health workers to treat leprosy;

- encouraging self-reporting and early treatment by promoting community awareness and changing the image of leprosy;
• monitoring the performance of Multi Drug Therapy services, the quality of patients’ care and the progress being made towards elimination through national disease surveillance systems.

Sustained and committed efforts by the national programmes along with the continued support from national and international partners have led to a decline in the global burden of leprosy. Increased empowerment of people affected by the disease, together with their greater involvement in services and community, will bring us closer to a world without leprosy.

3.12 LEPROSY STILL EXIST

Yes – it’s not just people in the Bible who experienced leprosy. Every year between two and three hundred thousand people are diagnosed with it and an estimated two to three million people around the world are disabled because of it. Leprosy is a mildly infectious disease caused by a bacillus called Mycobacterium leprae (a relative of TB). It is most common in places of poverty – dirty water, poor nutrition and low standards of living mean people’s immune systems are not strong and they are unable to fight the disease.
3.13 COUNTRIES IS LEPROSY FOUND IN TODAY

Mainly in countries where there are high levels of poverty. See the map below for an overview of the number of new cases of leprosy detected around the world in 2010 (latest figures available).

3.14 LEPROSY PASSED

Scientists are not 100 per cent sure. It is not hereditary and cannot be caught by touch. Most scientists believe it is caught through droplets of moisture passing through the air from someone who has leprosy but has not yet started treatment. Symptoms can be slow to appear and it may be five or ten years before the disease appears after initial exposure.
3.15 SYMPTOMS FOR LEPROSY

The first signs are patches of skin which look paler than normal. Sometimes the person discovers nodules on the skin. It can be difficult to diagnose and sometimes people are not diagnosed or treated quickly enough. The Leprosy Mission has a lot of expertise in diagnosing leprosy and so works with governments around the world to ensure that medical staff know what to look for and how to treat it.

3.16 LEPROSY TREATED

Although there is no vaccine, leprosy is curable with Multi-Drug Therapy. Within two weeks of starting MDT there is no risk of the disease spreading to anyone else. These drugs need to be taken for either six or 12 month periods to be fully effective.
REFERENCE


   BBC News.


