

# Tuberculosis: Unveiling the ancient scourge.

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## Introduction

Tuberculosis (TB), often dubbed the "silent epidemic," has plagued humanity for millennia. This infectious disease, primarily caused by the bacterium *Mycobacterium tuberculosis*, has claimed countless lives throughout history and continues to be a global health concern. Despite advances in medicine, TB remains a formidable challenge, particularly in vulnerable populations and resource-limited settings. In this article, we will explore the history, causes, transmission, symptoms, diagnosis, treatment, and the ongoing efforts to combat TB.

## A glimpse into history

TB is not a recent affliction; it has a long and sorrowful history intertwined with human civilization. Evidence of TB has been discovered in ancient Egyptian mummies dating back to around 2400 BC. Over the centuries, TB has been given various names, including "consumption" and the "white plague," reflecting its devastating impact on those affected. In the 19th and early 20th centuries, TB reached epidemic proportions in Europe and North America, leading to the establishment of sanatoriums and hospitals to isolate and treat patients. The discovery of antibiotics in the mid-20th century, notably streptomycin, revolutionized TB treatment, and for a time, it seemed like TB might be conquered [1].

## The causative agent: *Mycobacterium tuberculosis*

*Mycobacterium tuberculosis*, the bacterium responsible for TB, is a formidable and highly specialized pathogen.

The mycobacterial cell wall is rich in lipids, including mycolic acids, which render it impermeable to many drugs and immune system components. This unique structure contributes to the bacterium's resistance to treatment. *M. tuberculosis* has a slow replication rate, making it difficult to target with antibiotics that work best against rapidly dividing bacteria. The bacterium can evade the immune system and antibiotics by residing inside host cells, primarily macrophages [2].

TB primarily spreads through the inhalation of respiratory droplets containing *M. tuberculosis*. When an infected person with active TB coughs or sneezes, they release these tiny droplets into the air, which can be inhaled by others nearby. Not everyone exposed to TB becomes infected, as the immune system can often contain the bacterium. However, in some cases, the bacterium can evade the immune response and establish an active infection.

## Symptoms of TB

TB can manifest in two forms: Latent TB Infection (LTBI) and active TB disease. Latent TB Infection (LTBI), the person is infected with *M. tuberculosis* but does not exhibit symptoms or feel sick. However, they may develop active TB disease in the future if their immune system weakens. LTBI is not contagious. Active TB disease occurs when the bacterium overcomes the immune system's defenses and causes symptoms. Common symptoms include persistent cough, fever, night sweats, weight loss, fatigue, and chest pain. If left untreated, active TB can be fatal. Also known as the Mantoux test, this involves injecting a small amount of tuberculin under the skin. A positive reaction indicates exposure to TB, but it does not distinguish between LTBI and active TB [3].

Interferon-Gamma Release Assays (IGRAs) blood tests measure the release of interferon-gamma in response to TB-specific antigens. Like the TST, a positive result indicates exposure to TB. This involves examining sputum samples under a microscope for the presence of Acid-Fast Bacilli (AFB), which are characteristic of *M. tuberculosis*. X-rays can reveal abnormalities in the lungs caused by TB infection. Definitive diagnosis often requires culture and molecular tests to confirm the presence of *M. tuberculosis* and assess its drug susceptibility. Treatment for TB involves a combination of antibiotics taken over several months. The most commonly used drugs include isoniazid, rifampicin, ethambutol, and pyrazinamide. The treatment regimen is tailored based on the type of TB (drug-susceptible or drug-resistant), the patient's age, and their overall health [4].

Drug-Resistant TB emergence of drug-resistant TB strains, including Multi Drug-Resistant TB (MDR-TB) and Extensively Drug-Resistant TB (EDR-TB), poses a significant threat. These forms of TB are more difficult to treat and can lead to treatment failure and higher mortality rates. TB disproportionately affects low- and middle-income countries, where limited access to healthcare, poverty, and malnutrition contribute to the disease's spread. HIV weakens the immune system, making individuals more susceptible to TB. TB is a leading cause of death among people living with HIV. The stigma associated with TB can deter individuals from seeking diagnosis and treatment, leading to delayed care and ongoing transmission. The Bacillus Calmette-Guérin (BCG) vaccine offers partial protection against TB but is less effective in preventing the pulmonary form of the disease, which is the most common [5].

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International organizations, governments, and non-governmental organizations have been working tirelessly to combat TB. The World Health Organization (WHO) has set ambitious targets to reduce TB incidence and mortality, and significant progress has been made in recent years. Improving diagnosis and treatment: Expanding access to diagnostic tests and effective treatment regimens. Providing preventive therapy to individuals at risk of developing TB, such as those with LTBI and people living with HIV. Investing in research to develop more effective TB vaccines. Raising awareness and addressing the stigma associated with TB to encourage early diagnosis and treatment.

## Conclusion

Tuberculosis is a persistent global health challenge with a deep-rooted history. Despite the obstacles it presents, significant progress has been made in diagnosis, treatment, and prevention. However, there is still work to be done to eliminate this ancient scourge. Combating TB requires continued research, increased access to healthcare, and concerted efforts on a global scale. Ultimately, the goal is to

eradicate TB and ensure that no one has to suffer from this devastating disease in the future.

## References

1. Travis J. Unveiling a tuberculosis drug target. *Science*. 1994;263(5144):172-3.
2. Singhal M, Khanna SC, Rai A, et al. Rare case of multi-drug resistant endometrial tuberculosis unveiled by DNA signature studies of the *rpoB*, *katG* and *inhA* genes. *Eur J Obstet Gynecol Reprod Biol*. 2012;164(1):114-5.
3. Merchant S, Bharati A, Merchant N. Tuberculosis of the genitourinary system-Urinary tract tuberculosis: Renal tuberculosis-Part I. *Indian J Radiol Imaging*. 2013;23(01):46-63.
4. Kumar VS, Dhananjaya SR, Gowda S. Tuberculosis treatment spills the beans on Wilson's disease and more. *MJAFI*. 2021 Oct 29.
5. Cruz AT, Mandalakas AM, Starke JR. Childhood tuberculosis: a preventable disease not being prevented. *Pediatrics*. 2012;130(6):e1672-3.