

Discovery of Diagnostic Methods and Therapeutic Drugs against Tuberculosis Infection

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INTRODUCTION

Johann Schonlein coined the term "tuberculosis" in 1834. There was a scientific debate about the exact etiology of tuberculosis at the beginning of the nineteenth century. There were numerous theories at the time that classified the disease as an infectious disease, a hereditary disease, or a type of cancer. Philipp Friedrich Hermann Klencke, a German physician, first produced human and bovine tuberculosis in 1843 by injecting extracts from a miliary tubercle into the liver and lungs. Hermann Brehmer, a tuberculosis patient, introduced the sanatorium cure for tuberculosis in his doctoral thesis in 1854. He stated that a long-term stay in the Himalayan Mountains aided in the cure of his tuberculosis. In 1865, Jean-Antoine Villemin, a French military surgeon, experimentally demonstrated the infectious nature of tuberculosis. He injected a rabbit with fluid from a tuberculous cavity of a tuberculosis patient who died. In 1882, Robert Koch, a German physician and microbiologist, identified, isolated, and cultured the tubercle *Bacillus* in animal serum. He then inoculated the bacillus into animals to create tuberculosis models.

DESCRIPTION

Vaccines and other therapeutic drugs

The late 1800's and early 1900's mark a turning point in the history of tuberculosis, with mortality steadily decreasing. This occurred prior to the introduction of antibiotics and TB immunization. The Bacillus Calmette-Guerin (BCG) vaccine against Tuberculosis (TB) was developed in 1906 by French physician Leon Charles Albert Calmette and immunologist Camille Guerin. Immunizations were first administered in Paris in 1921, primarily to children. Mass immunization was carried out, beginning with military recruits and elder people and progressing to the entire population at risk of developing tuberculosis. Later evidence suggested that, while this vaccine may be effective in preventing serious forms of childhood tuberculosis, but it does not have the same effect in adults. As a result, the primary

treatment is remained for the transmission prevention and anti-tubercular drug treatment of active cases. The Medical Research Council was established in the United Kingdom in 1913 with the primary goal of combating tuberculosis. Prior to the discovery of anti-TB drugs, patients' only medical options were surgical techniques such as plombage and pneumonectomy. "Plombage" is a surgical treatment for cavitary tuberculosis of the upper lobe of the lung that involves inserting an inert substance into the pleural space to compress the cavitary lesion.

Besides preventive vaccines, the discovery of antibiotics was a major breakthrough in tuberculosis treatment. Selman Waksman, Elizabeth Bugie, and Albert Schatz developed the tuberculosis antibiotic Streptomycin in 1943. Selman Waksman was awarded the nobel prize in chemistry in 1952. In the modern era, four antibiotics, isoniazid, pyrazinamide, ethambutol, and rifampin, are used to treat tuberculosis effectively. The World Health Organization (WHO) has committed to eradicating tuberculosis by 2050 through advancements in diagnostic procedures, therapeutic interventions, and preventive strategies.

Diagnostic methods

Wilhelm Konrad von Roentgen, a German physicist, discovered X-rays or Roentgenograms in 1895. Chest X-rays made it easier to diagnose pulmonary tuberculosis and follow-up on these patients and those suspected of having TB. In 1901, Roentgen was awarded the nobel prize in physics for this discovery.

CONCLUSION

Clemens von Pirquet and Charles Mantoux developed the tuberculosis skin test in 1907-1908, in which tuberculin (extracts of the tuberculosis *Bacillus*) is injected under the skin and the body's reaction is measured. In recent years, advances in tuberculosis diagnosis have included whole blood interferon-gamma release assays, which detect *M. tuberculosis* infection.

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Received: 06-Dec-2022, Manuscript No. MDTL-22-20653; **Editor assigned:** 08-Dec-2022, PreQC No. MDTL-22-20653(PQ); **Reviewed:** 22-Dec-2022, QC No. MDTL-22-20653; **Revised:** 29-Mar-2023, Manuscript No. MDTL-22-20653(R); **Published:** 05-Apr-2023, DOI: 10.35248/2161-1068.23.13.338

Citation: Smith C (2023) Discovery of Diagnostic Methods and Therapeutic Drugs against Tuberculosis Infection. *Mycobact Dis*. 13.338.

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