

As little was known about the disease, it was regarded with fear and Hippocrates noted (in 460 BC) that phthisis killed nearly everyone it came into contact with and warned doctors not to visit patients in the late stages of this disease for fear of developing it themselves.

Now we know better

Except for very young children, few people become sick immediately after the tuberculosis bacteria enter their body. The bacteria that enter the lungs are immediately killed by the body's defences. Those that survive the innate immune system are captured inside white blood cells called macrophages. The captured bacteria remain inside these cells in a dormant state for many years, walled off inside tiny scars in the lungs. And only in about 5-10% of cases, the bacteria start to multiply and cause the tuberculosis disease.

The first to view TB as a treatable disease, Hermann Brehmer suffered from TB himself. In 1854 he theorized that TB was treatable after his doctor recommended that he move to a more temperate climate, like the Himalayas. After recuperating there, he returned home healthy and cured. He built the first sanatorium where patients could recuperate under the influences of fresh air and healthy eating habits.

We now know that the bacteria walled off in those scars (in the lungs) will start to multiply when one's immune system can no longer effectively keep them in check. It is in this active phase that an infected person actually becomes sick and can spread the disease. Usually the bacteria become active when one's

immune system become impaired e.g. in advanced age, the use of steroids or presence of HIV.

Transmission

In 1720, an English physician, Benjamin Marten, was responsible for the first theory regarding M. tuberculosis as "wonderfully minute living creatures". He believed that healthy people contracted TB only if they spent extended periods of time with the infected, contradicting the views of Hippocrates on whether physicians should treat infected patients.

People with active tuberculosis in their lungs contaminate the air with bacteria when they cough, sneeze or spit. These bacteria can stay in the air for several hours. Tuberculosis is spread from person to person when one breathes in infected air during close contact.

You cannot get TB by just touching the clothes or shaking the hands of someone who is infected. Two years ago, a domestic helper was referred to me when the CXR required for her work permit renewal examination suggested the possibility of active tuberculosis of the lungs. This was subsequently confirmed when the sputum culture grew tuberculous bacilli.

Much to my surprise, the employer (a French national) chose to appeal to the MOM and her basis was that the maid can keep to her room during the treatment. And this lady has a two year old baby in the same house.

Diagnosis

· Chest X-rays:

Chest X-rays may reveal cavitations, calcification (healed disease), and nodes in the upper lobes but cannot confirm diagnosis.

• Smears and cultures:

Sputum smears are helpful in diagnosing pulmonary Tuberculosis. Robert Koch was the first to see Mycobacterium tuberculosis with his staining technique in 1882.

Typically, these early morning specimens of sputum are obtained on three different days. The specimen is prepared on a slide, stained with an acid-fast dye, and observed under a microscope. The slide shows the characteristic acid-fast bacilli. Definitive diagnosis requires growing the bacteria and confirming that the culture is Mycobacterium tuberculosis. This process can take several weeks.

Tuberculin skin test:

The tuberculin skin test is based on the fact that infection with M. tuberculosis produces a delayed-type hypersensitivity skin reaction to certain components of the organism. This will manifest as a swelling which should be read within 72 hours of the test.

Treatment

The first therapy for TB patients was created by Forlanini, an Italian doctor, in 1890. He found that collapsing the lungs had positive effects on recovery from tuberculosis. But it wasn't until recently, within the last 200 years, that effective treatment methods became available. Between 1944 to 1963, the main types of antibiotics effective against Tuberculosis were discovered in rapid succession. Finally a cure was possible. However to this day, tuberculosis is not totally eradicated. As Tuberculosis bacteria are very slow-growing, the antibiotics must be taken for a long time - usually for 6 months or longer. Often the patient feels completely well after the first 2 months of treatment thus compliance becomes a problem. Furthermore the various drug combinations (4 drugs in the first 2 months followed by 2 drugs in the next 4 months) give rise to many unpleasant side effects.

If the course of drug treatment is not faithfully taken and completed, development of drug resistance becomes a major hurdle to the eradication of TB. This is worsened by the fact that the discovery of new effective drugs against TB is progressing at a snail's pace.

Prevention

These are 2 aspects of prevention.

- Stopping the spread of disease
 - · Early recognition and treatment of active disease.
 - BCG vaccination to protect young children.
 - Keep healthy by eating properly, sleep and exercise adequately to keep your immune system in top form.
 - Infected patients should cough into a piece of tissue paper or napkin and remain in isolation for 1-2 weeks or until they stop coughing.
 - Ensuring good ventilation at home helps to lower the concentration of bacteria and limit the spread and especially in places where people at risk are gathered, such as homeless shelters, jails, and hospital and emergency department waiting areas.
- Treating early infection
 - Patients with positive tuberculin test should have a routine CXR. Those with x-ray abnormalities suggesting TB require further evaluation for active TB including sputum examination and culture.



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