

Understanding Tuberculosis

Tuberculosis is a contagious infection caused by *Mycobacterium tuberculosis*, which is carried through the air. Tuberculosis usually affects the lungs, but it can attack almost any area of the body.

Since anti-tuberculosis antibiotics were developed in the 1940s, tuberculosis has been taken less seriously than it once was. A variety of factors, however, had made it a growing health concern, including shrinking public health resources, more people with weakened immune systems due to AIDS, increasing resistance to antibiotics and extreme poverty in many parts of the world.

Worldwide, three million people die from tuberculosis every year. An estimated one out of every three people in the world has a dormant tuberculosis infection, although only five to 10 percent develop active tuberculosis.

Symptoms

When a microorganism infects a person's body, he or she usually becomes sick within one to two weeks, but not with tuberculosis. Except for very young children, people can have live bacteria "sleeping" inside their bodies for many years. The body's defense mechanisms prevented the bacteria from developing into full-scale tuberculosis, but have not killed the bacteria. These sleeping bacteria cannot be spread to other people.

In the vast majority of people, the bacteria never cause problems. In five to 10 percent, however, the bacteria start to multiply and develop tuberculosis, usually within the first two years after infection. Although what causes the bacteria to become active is not known, it can happen because of an immune system weakened by advanced age, the use of corticosteroids or AIDS.

In this phase, an infected person feels sick and can spread the disease to other people. The bacteria that cause tuberculosis can live only in people. It cannot be carried by animals, insects, soil or nonliving objects. The bacteria spread only through the air when a person coughs, sneezes or speaks. The bacteria can stay in the air for several hours, making it possible for many other people to become infected with tuberculosis.

The signs of tuberculosis may not appear to be serious at first. They include:

- Coughing, which produces a small amount of green or yellow sputum in the morning. As the disease gets worse, the sputum may be streaked with small amounts of blood.
- Cold night sweats, which are heavy enough to wake a sleeper up and require a change of nightclothes or bed sheets
- Not feeling well in general

- A loss of energy and appetite
- Weight loss over time
- Sudden shortness of breath along with chest pain may be a sign that air or fluid has entered the space between the lungs and the chest wall (pneumothorax). For many people this is the first sign that leads them to seek a diagnosis.

When a tuberculosis infection first occurs, the bacteria may travel from the lungs to the lymph nodes that drain the lungs. If the body is able to bring the infection under control at this stage, the bacteria become dormant.

A dangerous complication for young children, whose immune systems are weaker and bodies are smaller, is that the lymph nodes can swell large enough to press on the bronchial tubes, causing a cough and possibly a collapsed lung. Sometimes, the bacteria spread up the lymph system to the lymph nodes in the neck, in which case, the infection may break through the skin and let loose pus.

In people with a fully functioning immune system, active tuberculosis is usually limited to the lungs (pulmonary tuberculosis). Tuberculosis that affects other parts of the body (extrapulmonary tuberculosis) comes from pulmonary tuberculosis that has spread through the blood. As in the lungs, the infection may not cause disease, but the bacteria may remain dormant in a very small scar. Latent organisms in these scars can reactivate later in life, leading to symptoms in the organs involved. In pregnant women, the tuberculosis bacteria may spread to the fetus and cause disease; however, such congenital tuberculosis is uncommon. If the tuberculosis infection occurs outside the lungs, it usually affects the kidneys and the lymph nodes. Symptoms of a tuberculosis infection elsewhere than the lungs tend to be vague and include:

- Fatigue
- Poor appetite
- Fevers that come and go
- Sweats
- Weight loss in some cases
- Pain

Other types of tuberculosis include:

- Tuberculosis meningitis, which affects the tissues that cover the brain. This is life threatening. Symptoms include fever, a headache that does not go away, stiffness in the neck, nausea and sleepiness that can develop into a coma.
- Tuberculoma, which affects the brain itself and forms a mass that causes headaches, seizures or muscle weakness
- Tuberculous pericarditis, which affects the membrane that covers the heart (pericardium). This type of tuberculosis causes the pericardium to thicken. Sometimes which affects the membrane that covers the heart (pericardium). This type of tuberculosis causes the pericardium to thicken. Sometimes fluid will leak from the layers of the pericardium into the space between the pericardium and the

heart, making it harder for the heart to pump. It can cause swollen veins in the neck and difficulty breathing.

- Intestinal tuberculosis, which may not cause any symptoms but does create an abnormal mass of tissue that can be mistaken for cancer
- Miliary tuberculosis, which is a life-threatening type of tuberculosis that occurs when a large number of bacteria are spread throughout the body in the bloodstream. It gets its name from the millions of tiny lesions formed, which are the size of millet, a tiny round seed. If it gets into the bone marrow, it can cause severe anemia and blood conditions that seem like leukemia.

Causes and Risk Factors

In the United States and other developed countries, tuberculosis is more likely to affect older people. In poorer countries, it is a disease of young adults. People of European ancestry are somewhat less likely to get tuberculosis because the bacterium for it has existed a long time in Europe. People from other parts of the world, where tuberculosis is a newer disease, are at greater risk of developing it. In the United States, tuberculosis is more common among African Americans, Native Americans and immigrants from non-European countries.

Poverty, poor nutrition, crowded living conditions, exposure to tuberculosis and lack of access to medical care all increase the risk of developing tuberculosis.

Diagnosis

Because the symptoms of tuberculosis can start out as vague and flu-like, tuberculosis is often discovered from a chest X-ray done for another reason or a positive tuberculin skin test that was done for routine screening. When symptoms suggest tuberculosis, a doctor may recommend the following tests:

- A CXR if it has not already been done. The results may show abnormalities but often look like those of many other diseases. An X-ray alone cannot confirm tuberculosis.
- A tuberculin skin test (also called a Mantoux test or purified protein derivative {PPD} test), if it has not already been done. This test shows that an infection by the bacteria has occurred at some point in the person's life, but it does not reveal if the infection is currently active. The test itself involves injecting a small amount of protein from tuberculosis bacteria between layers of the skin. About two days later the site is checked. If there is swelling larger than a certain size that feels firm when touched, the person has been infected with tuberculosis (the test is positive). Redness without swelling indicates that there is no infection.
- A sputum sample to be analyzed in a laboratory for the presence of tuberculosis bacteria. The sample may also be used to grow a culture of the bacteria to make sure the test results are accurate.

In the event that other conditions (such as lung cancer) are suspected, the doctor may order a bronchoscopy, which uses an instrument to examine the bronchial tubes and get samples of mucus or lung tissue. If there are signs of tuberculosis meningitis, a doctor may take a sample of spinal fluid (do a spinal tap) to analyze for bacteria. Treatment is usually started if there is even a suspicion of tuberculosis meningitis because the analysis takes time and the condition is life threatening.

Treatment

Just as tuberculosis is slow to develop symptoms, it is slow to respond to the many antibiotics that can be used against it. Antibiotics must be taken for six months or longer - long after a person feels completely well - or the disease tends to return. Because many people find it difficult to take their drugs for a long time or tend to stop taking them when they feel better, many doctors recommend that people with tuberculosis receive their drugs from a healthcare worker (directly observed therapy, DOT). Because this assures that treatment is being received, DOT treatments are usually shorter and given only two to three times a week.

Two or more antibiotics that work in different ways are normally given to help kill bacteria resistant to a particular drug. A third and fourth drug may be given during the first intense phase of treatment to make it shorter and more effective.

Surgery is usually not needed, but it may be used when a person has a particularly drug resistant infection or to drain infection from the lungs.

Contact Us

For more information/question or comment about Pneumonia

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