

# Tuberculosis (TB)

Tuberculosis, a sometimes crippling and deadly disease, is on the rise and is revisiting both the developed and developing world. Globally, it is the leading cause of deaths resulting from a single infectious disease. Currently, it kills three million people a year and, if the present trend continues, it is likely to claim more than 30 million lives within the next decade. Recent increases in migration have rapidly mixed infected with uninfected communities and contributed to the spread of the disease.

## WHAT IS TUBERCULOSIS?

Tuberculosis is an infectious disease caused by the microorganism *Mycobacterium tuberculosis*. It can affect several organs of the human body, including the brain, the kidneys and the bones; but most commonly it affects the lungs (Pulmonary Tuberculosis). The first stage of the infection usually lasts for several months. During this period, the body's natural defenses (immune system) resist the disease, and most or all of the bacteria are walled in by a fibrous capsule that develops around the area. Before the initial attack is over, a few bacteria may escape into the bloodstream and be carried elsewhere in the body, where they are again walled in. In many cases, the disease never develops beyond this stage - and is referred to as TB infection. If the immune system fails to stop the infection and it is left untreated, the disease progresses to the second stage, active disease. There, the germ multiplies rapidly and destroys the tissues of the lungs (or the other affected organ). In some cases, the disease, although halted at first, flares up after a latent period. Sometimes, the latent period is many years, and the bacteria become active when the opportunity presents itself, especially when immunity is low.

The second stage of the disease is manifested by destruction or "consumption" of the tissues of the affected organ. When the lung is affected, it results in diminished respiratory capacity, associated with other symptoms; when other organs are affected, even if treated adequately, it may leave permanent, disabling scar tissue.

## WHAT ARE THE SYMPTOMS?

The primary stage of the disease may be symptom-free, or the individual may experience a flu-like illness. In the secondary stage, called active disease, there might be a slight fever, night sweats, weight loss, fatigue and various other symptoms, depending on the part of the body affected. Tuberculosis of the lung is usually associated with a dry cough that eventually leads to a productive cough with blood-stained sputum. There might also be chest pain and shortness of breath. This secondary stage, if affecting the lungs, is the contagious stage - when the bacteria can be spread to others.

## HOW DOES TUBERCULOSIS SPREAD?

The TB germ is carried on droplets in the air, and can enter the body through the airway. A person with active pulmonary tuberculosis can spread the disease by

coughing or sneezing. The process of catching tuberculosis involves two stages: first, a person has to become infected; second, the infection has to progress to disease. To become infected, a person has to come in close contact with another person having active tuberculosis. In other words, the person has to breathe the same air in which the person with active disease coughs or sneezes.

### **WHAT ARE THE CHANCES OF BECOMING INFECTED?**

A person has to come in contact with someone who has active TB disease with TB germs present in the sputum. The likelihood of this happening also depends on the time spent in close contact with the person with active disease. The process of infection progresses to disease in about ten percent of those infected, and it can happen any time during the remainder of their lives. Although the chance of progression to disease diminishes with the passage of time, TB can develop more easily if the immune system weakens, as happens with malnutrition, AIDS, diabetes, cancer, or treatment with immunosuppressant drugs. In people with both HIV and TB infection, as many as eight percent can develop TB each year. In the United States, about one person in every 5,500 is diagnosed as infected with TB.

### **IS THERE A TREATMENT?**

Yes - for either TB infection or active TB disease, antibiotic therapy can be used. It's simpler to treat TB infection; INH taken for 6-9 months can be completely effective. Treatment for active TB disease involves taking anti-tuberculosis drugs for 9-12 months, and possible initial confinement while considered infectious.

Simultaneously, you have to eat nourishing food, have adequate rest, and follow other physician recommendations. Rarely, it may be necessary to surgically remove a severely damaged part of an organ. After successful treatment, you will need to undergo periodic checkups to ensure health. It is also the only way to check for re-exposure, because once a skin test is positive, it will always be positive.

### **HOW IS TB DIAGNOSED?**

Usually, the initial diagnostic/screening test for tuberculosis is the skin test. A small amount of fluid is injected under the skin of the forearm; the fluid contains a protein derived from the microorganism causing TB, and is absolutely harmless to the body. The area is visually examined by a health professional after 48-72 hours to determine the result of the test. A positive skin test does not mean that you have active disease; rather, that you may have been exposed to the organism referred to as TB infection at some time in the past. If the result of the skin test is positive, a chest x-ray must be obtained to ascertain whether there is any active disease. A physician or a trained health professional will also review your history and may order further tests, if necessary. If you are diagnosed with active TB, you will be required to take medications as prescribed by the physician.

### **WHAT ABOUT THE BCG VACCINE USED IN MANY COUNTRIES OUTSIDE THE UNITED STATES?**

Many individuals who grew up in countries other than the United States or Canada have received the BCG (Bacille Calmette-Guerin) vaccine against tuberculosis. Studies have shown, however, that although some people are protected by this vaccine, many are either not protected at all, or are immune for only a short time.

If you have a positive reaction to the TB skin test and have received BCG, the nurse will consider certain factors and advise you on what to do next. Some of those factors may be: the extent of the reaction; whether you come from a country with a high incidence of TB; whether you have had contact with a person with active TB; and how many doses of BCG you have received. BCG vaccination is not a guarantee against becoming infected with TB, and a positive TB test is probably not due to prior vaccination with BCG. The importance of the skin test is that it shows if you have been exposed to tuberculosis; it helps determine if you are at risk for developing the disease and treatment can be provided before you become sick.

### **WHAT IF I DON'T TAKE THE MEDICATIONS?**

As stated earlier, the primary stage of tuberculosis infection is usually symptom-free, and ignoring the disease at this stage will allow it to progress to the secondary stage, or allow it to flare up later. Many times if there are symptoms, they start to disappear and you may start feeling better after a few weeks/months of treatment. If treatment is discontinued at this stage, or medications are not taken as prescribed, the bacteria will have an opportunity to develop a resistance to the drugs, and treatment will become ineffective later on. If you are diagnosed with active TB disease, taking the medications is required, as well as a possible initial confinement while considered infectious.

### **References:**

- C.D.C. TB Core Curriculum, 1994.
- W.H.O., Global Tuberculosis Program, 1997.