Tuberculosis (TB)

WHAT IS TUBERCULOSIS?

Tuberculosis (TB) is an infection caused by bacteria. TB usually affects the lungs but sometimes can affect other organs, especially in people with HIV who have a CD4 cell count under 200 cells/mm^3.

TB is a serious disease worldwide. Almost one-third of the world's population, and one third of people with HIV, are infected with TB. A healthy immune system can usually prevent active disease. TB is a major cause of death for people with HIV worldwide according to the World Health Organization (WHO).

The name tuberculosis comes from tubercles. These are small, hard lumps that form when the immune system builds a wall around the TB bacteria in the lungs. TB in the lungs is called pulmonary TB. The infection can spread from the lungs to the kidneys, spine, and brain. This is called extrapulmonary TB. It only shows up in people who have already been infected with TB but who have not been treated. People with HIV who live in areas where TB is common might develop extrapulmonary TB.

Active TB in the lungs can cause coughing for more than 3 weeks, weight loss, constant fatigue, night sweats, and fevers, especially in the evening. These are like the symptoms caused by pneumocystis pneumonia (PCP). The symptoms can vary if TB is in other parts of the body. If people with HIV and TB have unexplained symptoms, they should rule out active TB disease.

TB is transmitted through the air when someone with active TB of the lung coughs, sneezes, or talks. The ultraviolet rays in sunlight can kill TB. Good ventilation reduces the risk of TB infection. However, people who live in close contact with people who have active TB become infected easily. This is especially true if they have advanced HIV disease. People with HIV can become infected with TB at any CD4 cell count level.

TB AND HIV: A BAD PAIR

Many viruses and bacteria live in our bodies. A healthy immune system will control these germs so they won't make us sick. If HIV weakens our immune system, they can cause opportunistic infections (OIs).

The rate of TB for people with HIV in the U.S. is 40 times the rate for people who do not have HIV. TB rates all over the world are increasing because of HIV disease. TB can make HIV multiply faster, lower the CD4 cell count, and make HIV disease worse. This makes it important for people with HIV to prevent and treat TB.

HOW IS TB DIAGNOSED?

There is a simple skin test for TB infection. A protein found in TB bacteria is injected into the skin of your arm. If your skin reacts with swelling more than a certain size you have probably been infected with the TB bacteria. People with HIV should get a TB skin test to find out if they were exposed to TB in the past.

If HIV or another disease has damaged your immune system, you might not show any reaction to the skin test, even if you're infected. This condition is called anergy. If you have anergy, the most common way to test for TB is a sputum culture (see below).

A positive skin test usually doesn't mean you have active TB. Your healthcare provider will check x-rays of your lungs, ask you about other symptoms, examine samples of your sputum (fluid produced in the airways and lungs) and try to grow TB bacteria from those samples. They might also try to grow TB from samples taken from other parts of your body where TB can show up. This can take from 2-4 weeks depending on what method is used. It is difficult to diagnose active TB, especially in people with HIV, because it can look like pneumonia, other lung problems, or other infections. It can show up outside of the lungs. However, newer, faster tests are being developed.

HOW IS TB TREATED?

If you are infected with TB, but don't have the active disease, you should be treated with an antibiotic such as isoniazid (INH) for at least 6 months or with INH plus one or two other drugs for 3 months. INH can cause liver problems, especially for Black or Latinx/Hispanic people who were assigned female at birth. In 2011 a large study showed that using a once a week dose of INH with rifapentine for 3 months was equally effective. The U.S. Centers for Disease Control and Prevention (CDC) now recommends this shorter course of treatment. Unfortunately, rifapentine interacts with some protease inhibitors (PIs). Dosage adjustments may be required but have not yet been studied.

If you have active TB disease, you will be treated with antibiotics. Because the TB bacteria can develop resistance to individual drugs, you will be given a combination of antibiotics. TB drugs must be taken for at least 6 months but most cases of TB can be cured with existing antibiotics. If you don't keep taking the medications, the TB in your body might become resistant and the anti-TB drugs will stop working.

There are types of TB that are resistant to some antibiotics. These are called multi-drug resistant TB (MDR-TB) or extensively drug resistant TB (XDR-TB). These types of TB are much harder to treat. More medications have to be taken for a longer period of time. Cure rates are lower than for regular TB. edaquiline (Sirturo) is the first new TB drug in over 40 years. The FDA approved it at the end of 2012. It works against TB with resistance to current drugs.

MEDICATION PROBLEMS

Some of the antibiotics used to treat TB can damage the liver or kidneys. So can some antiretroviral medication (ARVs). It can be difficult to take drugs for both TB and HIV at the same time. INH can cause peripheral neuropathy, as can several ARVs, so there can be problems if these drugs are taken together. TB treatment can cause immune reconstitution inflammatory syndrome (IRIS).

WHAT IS LATENT TB?

People with latent TB infection are infected with the TB bacteria but do not have symptoms and they cannot spread TB bacteria to others. However, if latent TB bacteria become active in the body and multiply the person will go from having latent TB infection to being sick with TB disease. Without treatment, about 1 in 10 people with latent TB infection will get sick with TB disease during their lives. If the person has HIV and latent TB, the chance of re-activation to active TB is 1 in 10 per year (not life). For this reason, people with latent TB infection should be treated to prevent them from developing TB disease. There are several regimens to treat latent TB including isoniazid (INH) and rifapentine (RPT) for 3 months, rifampin (RIF) for 4 months, or INH for 6 months.

THE BOTTOM LINE

TB is a serious disease worldwide and kills more people with HIV than any other disease. TB and HIV both make each other worse.

There are effective treatments for TB infection and for active TB disease. If you are exposed to TB, or have signs of TB, get tested and treated.

The treatments for TB take a long time, and can be difficult to take at the same time as ARVs, but they can cure TB. Some TB drugs interact with ARVs, so treatment has to be carefully planned if you have both HIV and TB. Be sure you understand how important it is to take TB medications for the complete length of time they are prescribed.

MORE INFORMATION

CDC: TB and HIV Coinfection

CDC: Tuberculosis: The Connection between TB and HIV

HIV.gov: Mycobacterium tuberculosis Infection and Disease

HIV.gov: Considerations for Antiretroviral Use in Patients with Coinfections: Tuberculosis/HIV Coinfection

WHO: Tuberculosis and HIV

UNAIDS: Tuberculosis

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