

Tb patient hiv



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CASE HISTORY

You have just been accepted into the nursing school at a local medical center. The program requires that you have a physical, which includes a tuberculosis (TB) test as well as the hepatitis B recombinant vaccine series. The nurse administering the TB skin test explains that if significant welling occurs around the injection site, you will probably have to have a chest X-ray to determine if you are infected with *Mycobacterium tuberculosis*. One and a half days later, you wake up and look at your arm, which appears swollen in an area about the size of a quarter around the skin test. It is red and tender to the touch. You are alarmed; could you have TB?

1. Why does the reaction take 36-48 hours to show up?

The reaction of the TB injection takes 36-48 hours to show up because of the delayed (cellular) hypersensitivity reaction. The tuberculin reaction occurs primarily of mononuclear cells (small and medium sized lymphocytes and monocytes). Only a small amount of these cells appear to be lymphocytes sensitive to tuberculin. Biological substances that are active cause the reaction. Small lymphocytes (T lymphocytes) increase in response to the stimulus and will produce specific lymphocytes. Vascular permeability is increased and will cause redness of the skin and edema also occurs in tuberculin reactions. The reaction will not reach its peak for at least 24 hours after administration. A positive reaction consists of hardening around the injection site, which is called induration. A delayed hypersensitivity reaction occurs at 48-72 hours. Patients who are being tested for the first time and

elderly patients may develop a reaction much slower and may not peak for up to 72 hours.

2. You are referred for a chest x-ray, but the results are inconclusive. What happens next?

A chest x-ray cannot completely confirm that a patient has TB. Many other illnesses may produce abnormal or inconclusive results that may actually resemble TB on the x-ray. A bacteriologic culture that is positive will prove if the patient actually is positive for TB. TB bacteria can also be found in other parts of your body and a blood test can be ordered. The blood test is called QuantiFERON-TB Gold.

3. Six months later you are taking a medical microbiology course as part of your nursing curriculum. On the day you study tuberculosis, you suddenly realize why you had a positive skin test. It has nothing to do with a true infection, but with the fact that you were born in the Netherlands. Your family moved to the U. S. when you were 4 years old. Why do you suppose is going on here? Discuss as fully as you can.

Bacille Calmette Guerin (BCG) is a vaccination made of a live, weakened strain of *Mycobacterium bovis*, which is related to the TB bacteria, *Mycobacterium tuberculosis*. In parts of the world in which TB is very common, babies and young children are given BCG to protect them from the exposure of TB. BCG is not used in the United States because it can cause the TB skin test to read negative and then positive. The Netherlands is one of the places that BCG is given at birth or given several times during early childhood. The BCG vaccine itself causes a positive skin reaction. A positive

skin test could also mean that you have been exposed to the virus at one time and be reported to your doctor so that any necessary actions can be taken.

4. You have a friend in our hometown who is HIV-positive. When you told her about your TB scare, she said that her specialist can't use the TB skin test on her, even though HIV-positive people are at higher risk for TB than the healthy population. Why is the skin test not recommended for HIV-positive people?

This is mainly about skin integrity of HIV patients. HIV patients have many dermatological conditions associated with the virus. The physician wants to make sure that you take care of your skin by making the skin less itchy and also to prevent the spreading of rashes. It is very difficult to heal open wounds of any kind when having HIV since your immune system is not as strong as a healthy person. An open wound is not only dangerous for the patient, but also family, friends, co-workers, and healthcare providers for the spread of other infections. Any open sore or abrasion should be avoided at any cost. Putting someone at risk by giving them a TB skin test and breaking the skin barrier will want to be avoided. There are cultures and blood tests that can be given by your physician to detect if you are indeed infected with TB.

5. How common is TB?

There are over 8 million cases each year of TB occurring worldwide. An estimation of 10-15 million people in the United States are infected currently

with TB and around 22, 000 additional cases occurring each year. The following are patients that are more prone to the TB bacteria:

Homeless people

People born from countries with high occurrence of TB

Prison inmates

Nursing home patients

IV drug users

Alcoholics

Diabetics

Certain cancers

HIV and AIDS virus

Health-care workers

What are the symptoms and treatment?

Symptoms of TB actually depend on if the TB is active, latent, and where in the body the bacteria is growing. Active TB usually has a positive skin test or blood test, abnormal chest x-ray, needs treatment, and the TB bacteria may spread to others at this time. Symptoms of active TB include weakness, fatigue, weight loss, no appetite, chills, fever, and night sweats. Latent TB also will have a positive skin test or blood test, normal chest x-ray, needs treatment to prevent the TB disease becoming active, but the bacteria

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cannot be spread to others at this time. There are no symptoms when the patient has the latent form. When TB has infected the lungs it is considered active and the patient will also have a bad cough that will last for several weeks or longer, pain in the chest, and coughing up blood.

One treatment for TB is drug combinations that are given so that there is less of a chance of drug-resistant organisms that survive. There are five antibiotics that are commonly used today to treat TB. These drugs are Isoniazid (INH), Rifampin, Pyrazinamide, Streptomycin, and Ethambutol. INH is used most frequently for the prevention and treatment of TB. Most patients are given INH along with Rifampin for a time period of 6 months and Pyrazinamide is also added for the first two months. Many patients will no longer be infectious after two weeks on the combination of antibiotic therapy.

The CDC released guidelines to individualize antibiotic therapy given to TB patients depending on their disease symptoms and how severe they were. Today many can receive once-weekly doses of Rifapentine in the continuation phase of treatment instead of a daily regimen for the period of 6 months. .

Surgical treatment of TB may be necessary if the medications are not effective.

There are three possible surgeries available for pulmonary TB patients: removing

the lung that is diseased, all or part of it; a pneumothorax, in which the lung is

collapsed by pushing air into the chest; and a thoracoplasty, in which one or more

ribs are removed given room for the lungs to expand.

Recovery from TB is quite good for most patients if the disease is diagnosed early and appropriate treatment is given. . According to a 2002 Johns Hopkins study, most patients in the United States that actually die from TB are older than 62 and also have other underlying diseases.

6. Discuss the drug resistant strain(s) of TB and some of the reason why they developed. Include in the discussion how we can prevent new drug resistant strains from developing.

When patients do not take antibiotics as directed by their physician or for long enough periods of time, the TB organisms actually become resistant to that drug. Many patients feel better after a couple of weeks and think they no longer need the medication, but they are doing more harm to their body than good. The patient is then at more risk for further infections when they are not compliant. .

Drug-resistant TB is a very serious problem in certain populations. INH-resistant TB is seen in Southeast Asia. The cough syrups in Southeast Asia contain INH-like substances as an ingredient and may play a role in causing the INH resistance. Prison populations are also at risk because of inadequate supply of the medication or by the medication being poorly formulated..

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When TB is resistant to at least two of the main drugs, INH and Rifampin, this is called multi-drug resistant tuberculosis (MDR-TB). TB that is resistant to three or more of the antibiotics has also come about also, which is called XDR-TB

Preventing XDR-TB from spreading is extremely important. The World Health Organization (WHO) recommends improving basic TB care to prevent resistance and the development of laboratories for detection of resistant cases. When drug-resistant cases are found appropriate treatment is necessary immediately. This will prevent further transmission.

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