

Tuberculosis

Definition

A contagious bacterial infection caused by *Mycobacterium tuberculosis* (TB). The lungs are primarily involved, but the infection can spread to other organs.

Causes, incidence, and risk factors

Tuberculosis can develop after inhaling droplets sprayed into the air from a cough or sneeze by someone infected with *Mycobacterium tuberculosis*. Infection usually occurs after prolonged exposure to an infected person. The disease is characterized by the development of granulomas (granular tumors) in the infected tissues. The usual site of the disease is the lungs, but other organs may be involved. Primary infection is usually asymptomatic. In North America, 95% of people will recover from primary TB infection without further evidence of the disease.

Pulmonary TB develops in the minority of people whose immune systems do not successfully destroy the primary infection. The disease may occur within weeks after the primary infection or it may lie dormant for years before causing disease. Infants, the elderly, and individuals who are immunocompromised (for example, those with AIDS, those undergoing chemotherapy, or transplant recipients taking antirejection medications) are at higher risk for rapid progression to disease. In pulmonary TB, the extent of the disease can vary from minimal to massive involvement, but without effective therapy, the disease becomes progressive.

The risk of contracting TB increases with the frequency of contact with people who have the disease, and with crowded or unsanitary living conditions and poor nutrition. An increased incidence of TB has been seen recently in the US. Factors that may contribute to the increase in tuberculous infection are:

- increasing numbers of AIDS cases
- increasing number of homeless individuals (poor environment and poor nutrition)
- the appearance of drug-resistant strains of TB

Incomplete treatment of TB infections (such as failure to take medications for the prescribed length of time) can contribute to the proliferation of drug-resistant strains of bacteria. Individuals with damaged immune systems from AIDS almost universally develop active tuberculosis upon exposure to the organism. In addition, without the aid of an active immune system treatment is more difficult and the disease more resistant to therapy.

The incidence of pulmonary tuberculosis is 3 out of 10,000 people and increasing. For the year July 1993 to July 1994 there were 11,694 cases of active tuberculosis reported to the U.S. Centers for Disease control.

Also see:

- disseminated tuberculosis (affects the whole body)
- atypical mycobacterial infection

Prevention

Routine skin testing for tuberculosis is done during routine well-baby exams. Infants are normally screened at 1 year and children at 5 years. Individuals exposed to tuberculosis should be skin tested immediately and the skin test repeated in 3 to 6 months if the initial skin test is negative.

Detection of early cases and prompt treatment are paramount in controlling the spread of tuberculosis.

A BCG vaccination for tuberculin-negative people who have been exposed to TB is given in some situations, but its effectiveness is under dispute. BCG is routinely used in some countries in Europe but is not routinely used in the United States. People who have had BCG should not be skin tested for tuberculosis.

Symptoms

- initially not apparent, or limited to minor cough and mild fever
- fatigue
- weight loss
- coughing up blood
- slight fever and night sweats

Additional symptoms that may be associated with this disease:

- wheezing
- rales
- sweating, excessive
- joint pain
- hearing loss
- diarrhea
- chest pain
- breathing difficulty
- positive Babinski's reflex
- clubbing of the fingers or toes

Signs and Tests

Examination of the lungs by stethoscope (auscultation) reveals crackles.

Tests often include:

- chest X-ray
- sputum cultures
- tuberculin skin test
- bronchoscopy
- open lung biopsy

Treatment

The goal of treatment is to cure the infection with antitubercular drugs. Daily oral doses of rifampin, isoniazid, and pyrazinamide (or occasionally others) are continued for 1 year. For atypical tuberculosis infections, or drug-resistant strains, other drugs may be indicated to treat the infection. Treatment of tuberculosis is often accomplished with multiple medications.

Hospitalization is indicated to prevent the spread of the disease to others until the infectious period is over, usually 2 to 4 weeks after the start of therapy. Normal activity can be continued after the infectious period.

Rest, a healthy environment (clean dry air), stress reduction and a good diet high in vitamin C, factors normally considered conducive to good health, improve the speed and response to treatment.

Support Groups

The stress of illness can often be helped by joining a support group where members share common experiences and problems. See lung disease - support group.

Expectations (prognosis)

Symptoms may improve in 2 to 3 weeks, with improvement seen in the chest X-ray lagging behind clinical improvement.

Complications

All medications used to treat TB have some toxicity. Rifampin and isoniazid may both cause a noninfectious hepatitis. Rifampin may also cause an orange or brown coloration of tears and urine.

Other complications include drug resistance to particular TB strains and a relapse of the disease in some patients.

Calling your health care provider

Call your health care provider if you have been exposed to tuberculosis, or if symptoms of TB develop, if symptoms persist despite treatment, or if new symptoms develop, including indications that complications are developing.