

Etiology and Epidemiology of Meningeal Tuberculosis

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DESCRIPTION

Tuberculosis (TB) is an airborne, contagious disease that typically affects the lungs. Mycobacterium tuberculosis is the bacterium that causes tuberculosis. If the infection is not treated promptly, the bacteria can spread throughout the body and infect other organs and tissues. Bacteria can sometimes spread to the meninges, which are the membranes that surround the brain and spinal cord. Meningeal tuberculosis is a potentially fatal condition caused by infected meninges. Tuberculosis of the meninges is also known as tubercular meningitis or TB meningitis.

Risk factors

Tuberculosis and tuberculosis meningitis can occur in children and adults of all ages. People with specific health issues, on the other hand, are at a higher risk of developing these conditions.

Risk factors for TB meningitis include having a history of:

- HIV/AIDS
- Excessive alcohol use
- Weakened immune system
- Diabetes mellitus

Because of high vaccination rates, TB meningitis is uncommon in the United States. Children between the ages of one and four are most likely to develop this condition in low-income countries.

Symptoms

TB meningitis symptoms usually appear gradually at first. Over the course of several weeks, they become more severe. Symptoms of an infection in its early stages can include:

- Fatigue
- Malaise
- Low-grade fever

The symptoms of the disease will worsen as the disease progresses. Meningitis symptoms like stiff neck, headache, and light sensitivity are not always present in meningeal tuberculosis. You may instead experience the following symptoms:

- Fever
- Dizziness
- Nausea and vomiting
- Irritability
- Unconsciousness

Diagnosis

1. The doctor will examine the patient and know about his/her symptoms and medical history
2. If doctor suspects about the possibility of having TB meningitis, he or she may order additional tests. A lumbar puncture, also known as a spinal tap, is one of these procedures. To confirm TB meningitis, they condition, they will collect fluid from the spinal column and send it to a laboratory for analysis.

Other tests doctor may use to evaluate the patients health include:

- Meningeal biopsy
- Blood culture
- Chest X-ray
- CT scan of the head
- Tuberculosis skin test (PPD skin test)

Complications

The complications of tuberculosis meningitis are severe, and in some cases fatal. They are as follows:

- Seizures
- Hearing loss
- Increased brain pressure
- Brain damage
- Stroke
- Death

Increased brain pressure can result in permanent and irreversible brain damage. If patients are experiencing both vision changes and headaches, these could be symptoms of increased brain pressure.

Treatment

TB infection is typically treated with four drugs:

- Isoniazid

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- Rifampin
- Pyrazinamide
- Ethambutol

Except for ethambutol, these medications are used to treat TB meningitis. Ethambutol does not penetrate well through the brain lining. In its place, a fluoroquinolone such as moxifloxacin or levofloxacin is typically used. Systemic steroids may also be prescribed by doctor. Steroids will help to reduce the condition's complications. Treatment can last up to 12 months, depending on the severity of the infection. In some cases, hospitalization of the patient is necessary.

Prevention

The most effective way to avoid TB meningitis is to avoid TB infections. The *Bacillus Calmette-Guérin* (BCG) vaccine can help control the spread of tuberculosis (TB) in communities where the disease is prevalent. This vaccine is effective in

preventing tuberculosis infections in young children. Treating people with dormant or inactive tuberculosis infections can also help control the disease's spread. Non-active or dormant infections occur when a person tests positive for tuberculosis but exhibits no symptoms of the disease. People with dormant infections can still spread the disease.

CONCLUSION

Meningitis is the most lethal form of tuberculosis, especially in people who are HIV-positive. Early detection and treatment can significantly reduce the disease's high mortality rate. In general, treatment should last at nine months and include at least four agents to which the *Mycobacterium tuberculosis* strain is known or susceptible. Adjunctive corticosteroid treatment should be considered, especially in people who do not have HIV. It is best to base therapy on TB resistance patterns, especially in HIV-coinfected individuals who are at high risk for drug-resistant TB.