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Short Communication

Pathogenesis Involved in Tuberculosis

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DESCRIPTION

Mycobacterium Tuberculosis (MTB) bacteria directly cause the infectious disease Tuberculosis (TB). Although it frequently affects the lungs, tuberculosis can also affect other body organs. When an infection remains undetected, it is referred to as latent tuberculosis. If left untreated, about 10% of latent tuberculosis will progress to active disease in nearly half of the population. Chronic cough with blood-colored mucus, fever, night sweats, and weight loss are typical signs of TB Disease. Due to the disease's interaction to weight loss. A broad range of symptoms can result from infection in other organs [1].

Patients with active TB in their lungs, it can be transmitted to other person through cough, spit, breathe, or sneeze [2]. People who have latent TB do not transmit the infection. Chest X-rays, microscopic analysis, and body fluid culture are used to diagnose active TB. The Tuberculin Skin Test (TST) or blood tests are used to diagnose latent TB.

Signs, symptoms and causes

Fever, chills, sweats at night, hunger loss, weight loss, and exhaustion are some common sign signs and symptoms. Mycobacterium Tuberculosis (MTB), a microscopic, aerobic, nonmotile bacillus, is the primary cause of TB. When compared to other bacteria, it can typically divide in less than an hour; it divides at an extremely slow rate for every 16 to 20 hours. A lipid bilayer can be found in the outer membrane of mycobacteria. Due to the high lipid and mycolic acid content of its cell wall, it is resistant to weak disinfectants.

Pathogenesis

Only 10% of people with M. tuberculosis have latent TB infections, which are asymptomatic and have a 10% lifetime chance of progressing into active tuberculous disease. The risk of acquiring active TB in people with HIV increases to over 10% year. The mortality rate for active TB individuals might reach 66% if effective treatment is not provided. When mycobacteria enter the lung's alveolar air sacs, they invade and multiply inside the endosomes of alveolar macrophages, which results in the initiation of TB infection. Macrophages detect the bacterium as foreign bacteria and make an effort to phagocytose. During this process, the macrophage encloses the bacterium and permanently retains it in a phagosome, a membrane-bound vesicle. A phagolysosome is produced once the phagosome reunites with a lysosome [3]. The cell attempts to kill the bacterium in the phagolysosome by using acid and reactive oxygen species. But M. tuberculosis is protected with mycolic acid capsule. In the macrophage, M. tuberculosis can reproduce and eventually destroy the immune cell.

One of the granulomatous inflammatory disorders is tuberculosis. Granulomas are formed by the aggregation of macrophages, epithelioid cells, T lymphocytes, B lymphocytes, and fibroblasts. Lymphocytes surround the infected macrophages. In the alveolar lumen, a massive multinucleated cell is formed when other macrophages target the infected macrophage. The granuloma may inhibit mycobacteria from spreading and provide a local environment for immune system cell interaction and this indicates that the bacteria employ the granulomas to evade the host's immune system. The immune response is inhibited when macrophages and dendritic cells in the granulomas can present antigen to lymphocytes. Latent infection can develop from bacteria that become dormant inside the granuloma. The development of aberrant cell death (necrosis) in the nucleus of tubercles is another characteristic of the granulomas [4]. The TB bacteria can spread throughout the body and produce several foci of infection if they are able to enter the bloodstream through a region of damaged tissue. Miliary tuberculosis is the name for this severe form of TB disease, which is particularly prevalent in young children and people with HIV.

CONCLUSION

Even with treatment, the mortality rate with this disseminated TB is significant. Healing and fibrosis frequently prevent tissue degeneration and necrosis. Scar tissue and cavities filled with tuberculosis necrotic cells by replacing the damaged tissue. Some of these cells are connected to the bronchi during an active disease, which allows material to be coughed up. Because it has active germs, it has the potential to spread an infection. The use of the proper antibiotics during treatment eliminates bacteria

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and promotes recovery. After therapy, scar tissue gradually replaces the damaged areas.

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