



COMMENTARY

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Risk factors of Active Tuberculosis, its Causes and Pathogenesis

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Description

Mycobacterium tuberculosis is typically to blame for the infectious disease tuberculosis (TB). People who have active TB in their lungs cough, spit, speak or sneeze can transmit the disease to others through the air. Latent TB carriers do not disseminate the illness. People with HIV/AIDS and smokers are more likely to have an active infection. Chest X-rays, microscopic investigation, and culture of bodily fluids are used to diagnose active TB. Blood tests or the tuberculin skin test (TST) are used to diagnose latent TB.

Pathogenesis

Only 10% of people with *mycobacterium tuberculosis* have latent TB infections, also known as latent tuberculosis infections (LTBIs). Which are asymptomatic and have a 10% lifetime chance of developing into overt active tuberculous disease. The chance of having active TB in people with HIV rises to over 10% year [1]. The fatality rate for active TB individuals might reach 66% if proper treatment is not provided. When mycobacteria enter the lung's alveolar air sacs they invade and multiply inside the endosomes of alveolar macrophages which is when TB infection starts [2]. Macrophages recognise the bacterium as being alien and make an effort to phagocytose it. During this process the macrophage encloses the bacterium and briefly stores it in a phagosome a membrane-bound vesicle [3]. A phagolysosome is produced once the phagosome joins forces with a lysosome. The cell tries to kill the bacterium in the phagolysosome by using acid and reactive oxygen species. But *mycobacterium tuberculosis* is shielded from these poisons by a thick, waxy mycolic acid capsule. In the macrophage, *mycobacterium tuberculosis* can reproduce and eventually destroy the immune cell [4].

Risk factors

Active disease risk: Concurrent HIV infection is the

biggest risk factor for developing active TB globally 13% of people with TB also have HIV [5]. In sub-Saharan Africa, where there is a high prevalence of HIV infection this is a particular issue. About 5%–10% of people with tuberculosis who are HIV-uninfected and infected over their lifetimes go on to get the disease in contrast 30% of people who are co-infected with HIV go on to develop the disease[6]. Another significant risk factor, particularly in the developed world is the use of certain drugs such corticosteroids and infliximab (an anti-TNF monoclonal antibody). Alcoholism, diabetes mellitus (3-fold increased risk), silicosis (30-fold increased risk), tobacco smoking (2-fold increased risk), indoor air pollution, malnutrition, young age, recently acquired TB infection, recreational drug use, severe kidney disease, low body weight, organ transplant, head and neck cancer, and genetic susceptibility (the overall importance of genetic risk factors is still unknown).

Infection susceptibility: Along with raising the risk of dying and having an active disease smoking tobacco also raises the risk of infections. Young age is one more element boosting infection vulnerability [7].

Causes

Mycobacterium tuberculosis (MTB), a tiny aerobic nonmotile bacillus is the primary cause of TB. Many of this pathogen's unusual clinical traits are explained by its high fat content. When compared to other bacteria which typically divide in less than an hour it divides at an incredibly sluggish rate every 16 hours to 20 hours [8]. Mycobacteria contain a lipid bilayer in their outer membrane. Due to the high lipid and mycolic acid content of its cell wall, MTB either stains extremely faintly "Gram-positive" or does not absorb dye when stained. MTB is resistant to weak disinfectants and can endure weeks of dryness. The bacteria can only grow in the cells of a host organism in nature, however *Mycobacterium tuberculosis* can be

grown in a lab. The upper portion of the lower lobe or the lower portion of the upper lobe are typically home to the Ghon focus, the predominant site of infection in the lungs. Lung tuberculosis can also develop as a result of bloodstream infection. The top of the lung is often where one may locate a Simon focus. Additionally, this hematogenous transmission has the potential to disseminate the infection to more remote locations including the bones, kidneys, brain, and peripheral lymph nodes. The disease can affect any region of the body but for unexplained reasons it rarely affects the thyroid, pancreas, skeletal muscles, or heart.

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