

Analysis of Infectious Characteristics of *Mycobacterium africanum*

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DESCRIPTION

Tuberculosis (TB) remains a major global health concern, affecting millions of people worldwide. While *Mycobacterium tuberculosis* (MTB) is the primary causative agent, other members of the *Mycobacterium tuberculosis* Complex (MTBC) have also been identified as contributors to the disease. Among them is *Mycobacterium africanum*, a lesser-known subspecies that is gaining recognition for its role in tuberculosis infections, particularly in certain regions of Africa. This article explores the characteristics, epidemiology, clinical manifestations, and diagnostic challenges associated with *Mycobacterium africanum*.

Characteristics of *Mycobacterium africanum*

Mycobacterium africanum is a slow-growing, acid-fast bacillus closely related to *Mycobacterium tuberculosis*. There are two main lineages of *Mycobacterium africanum*: West African (Lineage 5) and East African Indian (Lineage 6). The bacterium is known for its relatively lower virulence compared to *Mycobacterium tuberculosis*, suggesting differences in transmission dynamics and clinical outcomes.

Epidemiology

Mycobacterium africanum is predominantly found in West Africa, with countries such as Guinea, Guinea-Bissau, Mali, Ivory Coast, and Senegal reporting the highest prevalence. However, cases have also been reported in other parts of Africa, as well as in Europe and the Americas due to migration and travel.

Transmission and risk factors

The exact transmission mechanisms of *Mycobacterium africanum* remain unclear, but it is believed to be primarily transmitted through respiratory droplets, similar to *Mycobacterium tuberculosis*. Factors such as close contact with infected individuals, overcrowded living conditions, and weakened immune systems increase the risk of infection. Moreover, *Mycobacterium africanum* has been associated with a higher likelihood of infection among older individuals, suggesting a distinct age distribution compared to *Mycobacterium tuberculosis*.

Clinical manifestations

Mycobacterium africanum typically presents with pulmonary tuberculosis, similar to *Mycobacterium tuberculosis*. However, studies have indicated that *Mycobacterium africanum* infections tend to result in a milder form of the disease, with a lower frequency of cavitation and extra pulmonary spread. This observation may partly explain the lower overall disease burden in areas where *Mycobacterium africanum* is prevalent. Nevertheless, it is important to note that severe and disseminated cases of *Mycobacterium africanum* infection have also been reported, highlighting the potential for diverse clinical outcomes.

Diagnostic challenges

Accurate diagnosis of *Mycobacterium africanum* infections can be challenging due to its close genetic similarity to *Mycobacterium tuberculosis*. Conventional laboratory methods, such as Acid-Fast Bacilli (AFB) smear microscopy, are unable to differentiate between the two species. Molecular techniques, such as Polymerase Chain Reaction (PCR), offer improved sensitivity and specificity but may not be readily available in resource-limited settings where *Mycobacterium africanum* is often found. Moreover, the lack of awareness and specific diagnostic tools for *Mycobacterium africanum* further contribute to under diagnosis and potential misclassification.

Treatment and prevention

The standard treatment regimen for tuberculosis, including *Mycobacterium africanum*, consists of a combination of antibiotics, typically isoniazid, rifampicin, ethambutol, and pyrazinamide. However, drug resistance can pose challenges to treatment outcomes. In regions where *Mycobacterium africanum* is prevalent, targeted interventions should focus on improved case detection, prompt treatment initiation, and adherence to therapy. Additionally, public health efforts should prioritize reducing TB transmission through strategies such as infection control measures, contact tracing, and health education campaigns.

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