OPEN ACCESS Freely available online

Mycobacterial Diseases

ISSN: 2161-1068

Commentary

Challenges in Treating Drug-Resistant Tuberculosis

Christo Graha*

Department of Respiratory Medicine, Homerton University Hospital, Homerton Row, London, United Kingdom

DESCRIPTION

Tuberculosis (TB), caused by the bacterium *Mycobacterium tuberculosis*, remains a significant global health challenge. Despite advancements in diagnostic tools and treatments, TB continues to cause morbidity and mortality worldwide. One of the major hurdles in TB control is the emergence of drug-resistant strains, specifically Multidrug-Resistant (MDR) and Extensively Drug-Resistant (XDR) *Mycobacterium tuberculosis*. This article delves into the characteristics, causes, and implications of MDR and XDR TB, along with strategies for management and prevention.

Drug resistance in TB

Multidrug-Resistant TB (MDR-TB): MDR-TB is defined as TB that is resistant to at least isoniazid and rifampicin, the two most potent first-line anti-TB drugs. These drugs are the fundamental of standard TB treatment regimens, and resistance to them significantly complicates treatment, requiring longer, more toxic, and more expensive regimens.

Extensively Drug-Resistant TB (XDR-TB): XDR-TB goes a step further, being resistant to isoniazid and rifampicin, plus any fluoroquinolone, and at least one of the three second-line injectable drugs (amikacin, kanamycin, or capreomycin). This level of resistance leaves very limited treatment options, making XDR-TB particularly challenging to manage and cure.

Causes of drug resistance

The development of drug-resistant TB is largely due to improper use of antibiotics during treatment. Patients not completing their full course of treatment or healthcare providers prescribing incorrect treatment regimens. Substandard or counterfeit medications can contribute to ineffective treatment and resistance development. MDR and XDR strains can be directly transmitted from person to person, spreading drug-resistant TB within communities. TB patients co-infected with HIV are at a higher risk of developing drug-resistant TB due to their compromised immune systems and the complexity of managing both infections.

Clinical and public health implications

Drug-resistant TB poses significant challenges for both individual patient management and public health systems. Treating MDR and XDR-TB requires second-line drugs, which are often less effective, more toxic, and require longer treatment durations (up to 24 months or more). Patients also need close monitoring for adverse effects and adherence to treatment, which is critical for successful outcomes. The treatment of XDR-TB can be even more complex and less successful, with higher mortality rates compared to drug-susceptible TB. The spread of drug-resistant TB strains complicates TB control efforts. It demands more resources for diagnosis, treatment, and monitoring. Additionally, drug-resistant TB outbreaks can strain healthcare systems, especially in low- and middle-income countries where TB is most prevalent.

Strategies for management and prevention

Rapid and accurate diagnosis of drug-resistant TB is important. Molecular diagnostic tools, such as the GeneXpert MTB/RIF assay, allow for quick detection of rifampicin resistance, providing a critical step in initiating appropriate treatment regimens. Ensuring patients complete their prescribed treatment regimens is essential to prevent the development and spread of drug-resistant TB. Directly Observed Treatment, Short-course (DOTS) strategy is effective in promoting adherence. Research and development of new TB drugs and treatment regimens are vital. Newer drugs like bedaquiline and delamanid, and shorter, more effective treatment regimens, offer hope in the fight against MDR and XDR-TB. Investing in healthcare infrastructure, ensuring a steady supply of quality-assured medications, and training healthcare workers are fundamental to combating drug-resistant TB.

CONCLUSION

Circulating immune complexes offer a promising avenue for

Correspondence to: Christo Graha, Department of Respiratory Medicine, Homerton University Hospital, Homerton Row, London, United Kingdom, Email: g.chri126@nh.net

Received: 03-Apr-2024, Manuscript No. MDTL-24-32620; **Editor assigned:** 05-Apr-2024, PreQC No. MDTL-24-32620 (PQ); **Reviewed:** 19-Apr-2024, QC No. MDTL-24-32620; **Revised:** 26-Apr-2024, Manuscript No. MDTL-24-32620 (R); **Published:** 03-May-2024, DOI: 10.35248/2161-1068.24.14.454.

Citation: Graha C (2024) Challenges in Treating Drug-Resistant Tuberculosis. Mycobact Dis.14:454.

Copyright: © 2024 Graha C. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

improving the diagnosis and management of pulmonary tuberculosis. By providing early detection, aiding in the differentiation between latent and active TB, and monitoring treatment response, CICs can significantly improve patient outcomes. Continued research and development in this area are essential to fully realize potential of CICs in the fight against TB.