

Detection and Epidemiology of *Mycobacterium Tuberculosis* in Healthcare Settings: Challenges and Strategies

Irdina Ahmad Ramiz^a, Nurul Akmar Ghani^{a*}

Structured Abstract

Background: Tuberculosis (TB) is caused by *Mycobacterium tuberculosis* (MTB) and it is one of the most common infectious diseases. The healthcare setting is also prone to TB because of the contact established by healthcare workers (HCWs) with the patients who are either not diagnosed or not under treatment. This problem has increased the concern towards infection control and occupational safety at the healthcare institutions.

Literature Review: The ability of MTB to live within the environment especially the poor ventilation wards, has been established in various studies. Such characteristics as its waxy cell wall, disinfectant resistance and dormancy all lead to its persistence. Furthermore, studies denote that the healthcare professionals have a higher risk of becoming infected due to long-term exposure in unsuitable protective equipment, insufficient training, and the presence of medical conditions. When the IGRA and qPCR are being used as early detection methods, they do not have uniform application across the facilities.

Objective: This review attempts to provide an in-depth understanding of how MTB is maintained by investigating its biological adaptations and methods of transmission. It also seeks individual and professional risk factors of care professionals, such as job position, working environment, presence of comorbidities, etc., which predispose them. As well, the review evaluates the effectiveness of existing preventive tools, including environmental control measures, administrative control modes, and personal protective gear (PPE), and discusses how the early identification of a patient with the help of modern diagnostic tools can significantly improve the treatment process and reduce tuberculosis transmission in the clinical setting.

Conclusion: Suppression of tuberculosis in the hospital setting remains to be a tedious yet vital undertaking. Screening out early, enhancing HCW awareness and strengthening infection control are important ways of reducing the transmission of MTB. Conclusions of the review lead to taking certain actions and making evidence-based preventative strategies in place as soon as possible and ensuring worldwide cooperation to protect medical workers.

Keywords: Tuberculosis, latent tuberculosis, *Mycobacterium tuberculosis*, healthcare workers, infection controls

*Correspondence: nurulakmar@uitm.edu.my

^aSchool of Biology, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia