Balkan Med J 2023;40:384-5

Beyond Tuberculosis: The Growing Threat of Nontuberculous Mycobacteria

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Nontuberculous mycobacteria (NTM) are mycobacterial pathogens other than Mycobacterium tuberculosis or Mycobacterium leprae.[1] Even when this group of bacteria was named, they lagged behind the fame of tuberculosis, which is as old as human history. They have been labeled "atypical" simply because they are not mycobacterium tuberculosis. Similarly, their most common naming includes an exclusion and is defined as nontuberculous mycobacteria (NTM).

Hospitals, buildings, apartments, and plumbing systems of houses are ideal places for this large group of bacteria to live and grow because of the common living spaces with humans.[2] The impact of environmental factors on NTM infections suggests that these pathogens are widespread and can be transmitted from various sources. This diversity of environmental sources is an important and difficult to control variable for infection control strategies.

The complexity of the naming and definition process is also experienced in the diagnostic processes related to NTMs. The Ziehl-Neelsen staining method does not differentiate between NTMs and Mycobacterium tuberculosis complexes. Molecular diagnostic tools will eliminate this uncertainty.[3] Approximately 200 species have been identified using the aforementioned molecular-based techniques and genome sequencing.[4] Although the use of more advanced diagnostic methods has enabled the effective detection of the disease, several laboratories cannot keep up with the NTM-related developments.

In addition to causing localized infections in the lymphatic system, skin, soft tissue, and bone, NTMs can cause a pulmonary disease (NTM-PD) similar to tuberculosis.[5] A fundamental and distinctive difficulty with this group of bacteria is that this NTM-PD does not respond to the classical tuberculosis treatments. This increases the treatment failure rates to 50% in some studies.[6]

Because disadvantaged population groups, in whom tuberculosis infection is more common, cannot access quality healthcare, several lung infections caused by NTM may likely be misdiagnosed and treated as tuberculosis.

Current available data does not provide encouraging information regarding the situation in developed countries. A global increase in the incidence of NTM-PD has been reported, with some epidemiological data indicating that it is more common than tuberculosis in the industrialized world.[7,8] The increasing prevalence of NTM infections is likely closely related to various risk factors such as the tendency to frequently use immunosuppressants in various diseases, increase in the life expectancy of patients with chronic diseases, and changing trends in HIV infections.[9]

Individualized treatment strategies that are informed by precise strain identification and susceptibility testing are vital for the optimal management of NTM-PD. Due to the high cost of treatment, there are difficulties in obtaining the required drugs for minimum treatment duration of 12 months. Continuation of the treatment can lead to complications due to drug-related side effects. Because the pathogen is sensitive to only a limited number of drugs, clinicians cannot choose alternative drugs. Furthermore, the treatment success rate is low, treatment discontinuation rate is high, and newer drugs and treatment regimens are needed. The ideal drug combination, treatment duration, and actual efficacy for the treatment of NTM-related diseases remain unknown. Studies should prioritize the development of new drugs, treatment regimens, shorter regimens, and better tolerated regimens.[7,10]

The limitations of laboratory facilities, especially in regions where the incidence of tuberculosis is high, causes NTM infections to be misdiagnosed as tuberculosis, leading to multidrug resistance and possibly death. In places where the laboratory capacity is limited, the diagnostic capacity should be increased.

Recent literature reviews indicate that the disease burden caused by NTMs has increased significantly on a global scale. NTM infections not only affect a wide population, but they are also complex and expensive to treat, especially in areas with limited resources. This, in addition to complications arising from incorrect diagnoses and treatment approaches, may disrupt tuberculosis control strategies.

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Available Online Date: October 20, 2023 • DOI: 10.4274/balkanmedj.galenos.2023.2023-28092023

Available at www.balkanmedicaljournal.org

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Cite this article as:
Yıldız E. Beyond Tuberculosis: The Growing Threat of Nontuberculous Mycobacteria. *Balkan Med J.*; 2023; 40(6):384-5.

NTMs will soon become popular and the related uncertainties will be cleared. It remains unknown how prepared clinicians are for the increasing number of diseases caused by these pathogens. To overcome this uncertainty, cost-effective diagnostic processes, newer drugs, and treatment schemes are needed. Further studies in this relatively untouched area will not only enlighten us but also support the fight against tuberculosis and prevent possible deaths that may occur due to incorrect diagnoses and treatments.

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