

Threat of Mycobacterial Zoonoses

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DESCRIPTION

In the intricate web of the animal kingdom, there exists a silent threat that transcends species barriers, lurking in the shadows of our interactions with animals. Mycobacterial zoonoses, a group of diseases caused by bacteria of the genus *Mycobacterium*, pose a significant risk to both human and animal health worldwide. From tuberculosis to Johne's disease, these insidious pathogens have the potential to wreak havoc on populations, demanding attention and understanding to mitigate their impact.

Mycobacterial zoonoses

Mycobacteria are resilient organisms capable of surviving in diverse environments, including soil and water, as well as within the bodies of various animals. This adaptability facilitates their transmission between species, making them formidable adversaries in the realm of infectious diseases. Among the most notorious mycobacterial zoonoses is bovine Tuberculosis (bTB), primarily caused by *Mycobacterium bovis*, which affects cattle and can be transmitted to humans through consumption of contaminated dairy products or direct contact with infected animals.

Additionally, *Mycobacterium avium* subspecies *paratuberculosis* (MAP) is responsible for Johne's disease, a chronic enteritis primarily affecting ruminants such as cattle, sheep, and goats. Although controversial, there is evidence suggesting a potential link between MAP and Crohn's disease in humans, further highlighting the significance of mycobacterial zoonoses in the context of public health.

Transmission risk factors

Transmission of mycobacterial zoonoses occurs through various routes, including ingestion of contaminated food or water, inhalation of infectious aerosols, and direct contact with infected animals. Factors such as overcrowding, poor sanitation, and compromised immune function can exacerbate the risk of transmission, particularly in settings where humans and animals coexist in close proximity, such as farms, slaughterhouses, and wildlife reserves.

Furthermore, globalization and increased mobility contribute to the spread of these diseases across borders, underscoring the need for coordinated surveillance and control measures on a global scale. Vaccination of livestock, implementation of strict biosecurity protocols, and promotion of public awareness are essential components of efforts to mitigate the spread of mycobacterial zoonoses and safeguard both human and animal health.

Diagnosis

Diagnosing mycobacterial zoonoses presents significant challenges due to their slow growth rate and the need for specialized laboratory techniques. Traditional diagnostic methods, such as culture and microscopy, are time-consuming and may lack sensitivity, leading to delays in treatment initiation and potential underreporting of cases. Molecular techniques, such as Polymerase Chain Reaction (PCR) and Nucleic Acid Amplification Tests (NAATs), offer improved sensitivity and specificity but require sophisticated infrastructure and trained personnel, particularly in resource-limited settings.

Moreover, the emergence of antimicrobial resistance poses a formidable obstacle to the treatment of mycobacterial zoonoses, necessitating the development of novel therapeutic strategies and the prudent use of antibiotics in both human and veterinary medicine. Collaborative efforts between public health authorities, veterinarians, and medical professionals are essential to address these challenges and ensure effective control of mycobacterial zoonoses.

CONCLUSION

In confronting the threat of mycobacterial zoonoses, a holistic approach that transcends disciplinary boundaries is imperative. The One Health framework, which recognizes the interconnectedness of human, animal, and environmental health, provides a blueprint for addressing the complex challenges posed by these diseases. By fostering collaboration between stakeholders and adopting a multidisciplinary approach to surveillance, prevention, and control, we can mitigate the

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impact of mycobacterial zoonoses and protect the health and well-being of both humans and animals. In the battle against these elusive pathogens, knowledge is our most potent weapon.

Through continued research, innovation, and cooperation, we can uncover the secrets of mycobacterial zoonoses and pave the way towards a safer, healthier future for all.