

Unveiling *Corynebacterium pseudodiphtheriticum* : A Closer Look at Pneumonia's Lesser-Known Culprit

Negar Fani*

Department of Microbiology, Groech University, Graz, Austria

*Corresponding author: Negar Fani, Department of Microbiology, Groech University, Graz, Austria; Email: nfani123@emory.edu

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Introduction

Pneumonia, a respiratory infection affecting millions worldwide annually, typically conjures images of well-known pathogens such as *Streptococcus pneumoniae* or *Mycoplasma pneumoniae*. However, in the vast microbial landscape, there exist lesser-known culprits capable of causing pneumonia, one of which is *Corynebacterium pseudodiphtheriticum*. Despite its relatively low profile, this bacterium can instigate pneumonia, particularly in vulnerable populations. In this article, we delve into the intricacies of *Corynebacterium pseudodiphtheriticum*-associated pneumonia, exploring its epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment and preventive measures.

Description

Understanding *Corynebacterium pseudodiphtheriticum*

Corynebacterium pseudodiphtheriticum is a gram-positive, non-spore-forming *Bacillus* belonging to the *Corynebacterium* genus. It is commonly found as part of the normal flora in the upper respiratory tract, particularly in the oropharynx and nasopharynx, of healthy individuals. While it is considered a commensal bacterium under normal circumstances, *C. pseudodiphtheriticum* can become pathogenic, causing various infections, including pneumonia.

Role in pneumonia

Although *Corynebacterium* species are not typically considered primary pathogens in pneumonia, *C. pseudodiphtheriticum* has been increasingly recognized as a causative agent, especially in immunocompromised individuals and those with underlying respiratory conditions. Studies have shown that *C. pseudodiphtheriticum* pneumonia can occur in patients with Chronic Obstructive Pulmonary Disease (COPD), cystic fibrosis, bronchiectasis or those who are immunosuppressed due to conditions such as HIV/AIDS, cancer or immunosuppressive therapy.

Epidemiology

Corynebacterium pseudodiphtheriticum, a member of the *Corynebacterium* genus, resides primarily in the upper respiratory tract as a commensal bacterium. It is often overlooked in routine microbiological investigations due to its non-pathogenic nature. However, under certain conditions, such as immunocompromised states or underlying respiratory illnesses, *Corynebacterium pseudodiphtheriticum* can transition from a harmless bystander to a causative agent of pneumonia. The prevalence of *Corynebacterium pseudodiphtheriticum* pneumonia remains relatively low compared to other bacterial pathogens, but its significance lies in its potential to induce severe respiratory infections, particularly in susceptible individuals.

Pathogenesis

The pathogenesis of *Corynebacterium pseudodiphtheriticum* pneumonia is multifaceted and not yet fully elucidated. Similar to other opportunistic pathogens, its ability to cause disease is contingent upon various factors, including host immunity and microbial virulence. While *Corynebacterium pseudodiphtheriticum* typically exists in a commensal state in the upper respiratory tract, perturbations in the local microenvironment or host defenses can facilitate its transition to a pathogenic state. Factors such as impaired mucociliary clearance, compromised immune function and underlying lung conditions create a conducive milieu for *Corynebacterium pseudodiphtheriticum* colonization and subsequent invasion of lower respiratory tissues, culminating in pneumonia.

Clinical Manifestations

Clinical manifestations of *Corynebacterium pseudodiphtheriticum* pneumonia often mimic those of other bacterial pneumonias, presenting with symptoms such as fever, cough, dyspnea and chest pain. However, distinguishing features may include the absence of classic pneumonia pathogens in diagnostic tests and a less severe clinical course in immunocompetent individuals. In immunocompromised patients or those with pre-existing respiratory conditions, *Corynebacterium pseudodiphtheriticum* pneumonia can lead to more severe complications, including respiratory failure and septicemia. Given its diverse clinical presentation, a high index of suspicion is crucial for timely diagnosis and management.

Diagnosis

The diagnosis of *Corynebacterium pseudodiphtheriticum* pneumonia relies on a combination of clinical evaluation, radiographic findings and microbiological testing. Chest X-rays may reveal infiltrates consistent with pneumonia, although these findings are nonspecific and can overlap with other respiratory infections. Microbiological confirmation through sputum culture or bronchoalveolar lavage is essential for identifying *Corynebacterium pseudodiphtheriticum* as the causative agent. However, distinguishing between colonization and true infection can be challenging, particularly in patients with multiple comorbidities or prior antibiotic exposure. Molecular techniques, such as Polymerase Chain Reaction (PCR), may offer enhanced sensitivity and specificity in detecting *Corynebacterium pseudodiphtheriticum* DNA in respiratory specimens.

Treatment

The management of *Corynebacterium pseudodiphtheriticum* pneumonia entails antibiotic therapy tailored to the susceptibility profile of the isolate. Empirical treatment often involves broad-spectrum antibiotics targeting common respiratory pathogens until microbiological results are available. Once *Corynebacterium pseudodiphtheriticum* is identified, appropriate antibiotics, such as penicillin, cephalosporins or macrolides, can be initiated based on susceptibility testing. In severe cases or in immunocompromised patients, combination therapy or prolonged courses of antibiotics may be warranted to ensure clinical resolution and prevent relapse. Supportive measures, including oxygen therapy and ventilatory support, may be necessary for patients with respiratory compromise.

Prevention

Preventive measures for *Corynebacterium pseudodiphtheriticum* pneumonia primarily focus on reducing risk factors predisposing individuals to respiratory infections. Immunization against vaccine-preventable diseases, such as influenza and pneumococcal pneumonia, can mitigate the risk of secondary bacterial infections, including those caused by *Corynebacterium pseudodiphtheriticum*. Additionally, maintaining optimal respiratory hygiene, including hand hygiene, cough etiquette and avoidance of tobacco smoke, can help minimize exposure to respiratory pathogens and reduce the likelihood of pneumonia transmission. For immunocompromised individuals or those with underlying respiratory conditions, adherence to medical therapies and regular follow-up care are essential for preventing disease exacerbations.

Conclusion

Corynebacterium pseudodiphtheriticum pneumonia represents a lesser-known yet clinically significant entity in the realm of respiratory infections. Although infrequent, its potential to cause severe pneumonia, particularly in vulnerable populations, underscores the importance of recognizing and appropriately managing this pathogen. Enhanced understanding of *Corynebacterium pseudodiphtheriticum*'s epidemiology, pathogenesis, clinical manifestations, diagnosis, treatment and preventive strategies is essential for optimizing patient outcomes and minimizing disease burden. Further research into the intricate interplay between host factors and microbial virulence will undoubtedly shed more light on this enigmatic bacterium and inform future therapeutic interventions.