

SPECIFICITY OF ANTIBACTERIAL ACUITY IN DISEASES OF THE LUNGS, ACCOMPANIED BY POSTCOVID SYNDROME, WHICH OCCURS IN CHILDREN

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Abstract

This article explores the specificity of antibacterial treatment of lung diseases in children with post-COVID syndrome. The focus is on understanding specific bacterial profiles, therapeutic responses, and outcomes in post-pediatric covid cases. Comprehensive analysis of the existing literature, combined with empirical methods and results, provides the basis for discussions and conclusions aimed at improving treatment protocols.

Keywords: antibacterial tension, lung diseases, post-covid syndrome, Pediatrics, therapeutic response, bacterial profiles.

Introduction

The COVID-19 pandemic has had a significant impact on global health, with post-COVID syndrome emerging as a concern, especially in children. Post-COVID syndrome involves a series of symptoms that persist after the acute stage of infection, affecting various organs, including the lungs. This study focuses on the antibacterial treatment of lung diseases in children with post-COVID syndrome and aims to understand the specificity and effectiveness of these treatments. This study uses a mixed method approach that combines quantitative and qualitative data. The study includes:

Retrospective analysis of medical records of pediatric patients with post-COVID syndrome.

Bacterial culture and susceptibility test to detect common pathogens.

Assessment of antibacterial treatment regimens and their results.

Interviews with pediatricians and infectious disease specialists to gather insights into clinical practices and problems.

Post-COVID syndrome or long COVID can affect children, but its presentation can be different from that of adults. Bacterial infections are a major concern when it comes to lung diseases in children with Post-COVID syndrome. The specificity of antibacterial therapy in these cases includes several main points:

Bacterial coinfections and superinfections refer to bacterial infections that occur simultaneously with or after a primary infection, such as covid-19. These secondary infections can complicate the clinical course of the initial disease and require additional medical intervention.



Post-COVID syndrome in children:

Children recovering from COVID-19 may have weakened immune systems, making them more vulnerable to subsequent bacterial infections. This is due to the regulation of immunity caused by the virus, which can continue even after the acute stage of the disease.

Common Bacterial Pathogens:

Streptococcus pneumoniae: this bacterium is a common cause of pneumonia, meningitis and otitis (middle ear infection) in children.

Haemophilus influenzae: this bacterium, known for causing respiratory infections, can also cause meningitis and epiglottitis.

Staphylococcus aureus (including MRSA): this pathogen can cause skin and soft tissue infections, pneumonia, and sepsis. Methicillin-resistant *Staphylococcus aureus* (MRSA), especially due to its resistance to many antibiotics.

Mycoplasma pneumoniae: this bacterium, which is often responsible for atypical pneumonia, can cause lighter but persistent respiratory infections.

Children with post-COVID syndrome should carefully monitor these bacterial infections to ensure timely and proper treatment.

Antibiotic Selection:

The choice of an appropriate antibiotic involves understanding the likely pathogens and their resistance patterns. Initial treatment may include broad-spectrum antibiotics until specific pathogens are detected.

Common antibiotics and their use:**Amoxicillin-Clavulanate:**

- Spectrum: broad spectrum covering Gram-positive and gram-negative bacteria.
- Effective Against:
 - *Streptococcus pneumoniae* (*S. pneumoniae*)
 - *Haemophilus influenzae* (*H. influenzae*)

Macrolides (e.g. azithromycin):

- Spectrum: effective against a number of bacteria, especially useful for atypical pathogens.
- Effective Against:
 - *Mycoplasma pneumoniae*
 - Other atypical pathogens

Vancomycin or Linezolid:

- Use case: for those suspected of methicillin-resistant *Staphylococcus aureus* (MRSA) infections.
- Spectrum: first and foremost, Gram-positive coverage, including MRSA.



Preliminary Considerations:

- Broad-spectrum antibiotics: initially used to cover a wide range of potential pathogens until certain organisms are identified by examining cultures and sensitivities.
- Pathogen detection: once specific pathogens and their resistance laws are known, antibiotic therapy can be adapted to a more targeted approach.

Highlights:

- Local resistance patterns: knowing local resistance patterns is essential to choose the most effective empirical therapy.
- Deescalation: once pathogen detection and susceptibility results are available, it is recommended to deescalate to a narrow-spectrum antibiotic to reduce the risk of developing resistance.

Antibiotic Management:

It is very important to use antibiotics wisely to prevent antibiotic resistance. This includes:

- Narrowing of the spectrum of antibiotic therapy once certain pathogens and their susceptibility are known.
- Limit the duration of antibiotic therapy to the shortest effective period.
- Monitoring for side effects and secondary infections such as *Clostridioides difficile*.

Diagnostic Approaches:

For targeted therapy, it is very important to make an accurate diagnosis. This includes:

- Examination of culture and sensitivity: determines the specific bacterial pathogen and its susceptibility to antibiotics.
- PCR and other molecular tests: rapid detection of viral and atypical bacterial pathogens.

Supportive care and Monitoring:

In addition to antibiotic therapy, supportive care is essential to manage lung diseases in children with post-COVID syndrome. This includes:

- Respiratory support: oxygen therapy or, if necessary, mechanical ventilation.
- Hydration and nutrition: to ensure that the child is well hydrated and adequate nutrition.
- Observation of complications: such as deterioration of respiratory function or the development of chronic diseases such as bronchiectasis.

Preventive Measures:

Prevention of bacterial infections in children with Post-COVID syndrome includes:

- Vaccination: providing modern vaccines, including pneumococcal and influenza vaccines.
- Infection control: practices such as hand hygiene and wearing masks to reduce the spread of respiratory infections.

Managing antibacterial therapy in children with Post-COVID syndrome and lung diseases requires a complex and personalized approach. Close monitoring, selection of appropriate antibiotics and preventive measures are essential to improve the results of these patients.

The results highlight the complexity of treating lung diseases in children with post-COVID syndrome. The altered immune response after covid may contribute to the variability of treatment outcomes. The study highlights the importance of personalized medicine, including the need for regular bacterial culture and sensitivity testing in this patient group. In addition, the role of additional therapies to support the intelligence that guarantees immune function and lung health.



Conclusions and Suggestions

This study shows that antibacterial treatment in children with post-COVID syndrome requires a nuanced approach, taking into account specific bacterial profiles and changes in observed immunity. The main proposals include:

1. Conducting regular bacterial culture and sensitivity tests for patients with pediatric post-COVID.
2. Development of guidelines for personalized antibacterial therapy in this demography.
3. Encourage further research on post-COVID syndrome-based immune mechanisms to improve therapeutic interventions.
4. Training medical providers on the complexity of post-COVID syndrome and its impact on respiratory health in children.

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