Journal of Biomedical and Pharmaceutical Research
Available Online at www.jbpr.in
CODEN: - JBPRAU (Source: - American Chemical Society)
NLM (National Library of Medicine): ID: (101671502)
Index Copernicus Value 2018: 88.52
Research Article
Volume 10, Issue 2: March-April : 2021, 58-61
ISSN (Online): 2279-0594
ISSN (Print): 2589-8752

Efficacy of Antibiotics in Managing Mild to Moderate Exacerbations of Bronchial Asthma in Children Under 12 Years

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Article Info: Received 10 February 2021; Accepted 16 March 2021
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Abstract

Background: Bronchial asthma is a common chronic respiratory condition in children, characterized by intermittent exacerbations. Mild to moderate exacerbations often lead to increased healthcare utilization and can be distressing for both patients and caregivers. While the primary management focuses on bronchodilators and anti-inflammatory medications, the role of antibiotics in these exacerbations remains controversial.

Objective: This study aims to assess the efficacy of antibiotics in controlling mild to moderate exacerbations of bronchial asthma in children under 12 years of age.

Material and Methods: A total of 40 pediatric patients aged 2 to 12 years with mild to moderate asthma exacerbations were enrolled from the Department of Pediatrics at a tertiary care hospital. Each patient underwent a detailed clinical evaluation, including medical history and physical examination. Patients were randomly assigned to receive either standard asthma management or standard management plus antibiotics.

Results: The study demonstrated that children receiving antibiotics showed a statistically significant reduction in exacerbation frequency and severity compared to those receiving standard treatment alone. The findings are presented in Table 1.

Conclusion: Antibiotics may play a beneficial role in the management of mild to moderate exacerbations of bronchial asthma in children under 12 years. Further studies are warranted to explore the specific indications and optimal types of antibiotics.

Keywords: Bronchial asthma, children, antibiotics, exacerbations and pediatrics

Introduction

Bronchial asthma is a chronic inflammatory disorder of the airways, commonly seen in children and characterized by wheezing, breathlessness, chest tightness, and cough (1). The prevalence of asthma among children has risen significantly in recent years, with varying reports suggesting it affects approximately 5-10% of children globally (2). Asthma exacerbations can lead to considerable morbidity, necessitating medical intervention and sometimes hospitalization (3).

Mild to moderate exacerbations often arise due to viral infections, environmental triggers, or inadequate management of underlying asthma (4). The traditional approach to managing these exacerbations focuses primarily on bronchodilators and inhaled corticosteroids, with the aim of relieving airway obstruction and reducing inflammation (5). However, in some cases, the presence of concurrent bacterial infections may complicate the clinical picture, leading clinicians to consider antibiotic therapy (6).

The role of antibiotics in asthma management remains a topic of debate. Some studies suggest that antibiotics may help control exacerbations related to bacterial infections, while others indicate minimal benefit, highlighting the need

for a clearer understanding of their efficacy in this context (7). Additionally, inappropriate antibiotic use can contribute to resistance patterns, making it essential to weigh the potential benefits against the risks (8).

This study investigates the role of antibiotics in controlling mild to moderate exacerbations of bronchial asthma in children under 12 years. By comparing outcomes in patients receiving standard asthma treatment alone versus those receiving antibiotics, we aim to provide insights into their clinical utility in this pediatric population.

Aim and Objectives

- **Aim:** To evaluate the effectiveness of antibiotics in controlling mild to moderate exacerbations of bronchial asthma in children under 12 years.
- **Objectives:**

1. To assess the frequency and severity of asthma exacerbations in children receiving antibiotics compared to those who do not.
2. To analyze any associated clinical outcomes, including hospitalizations and the need for additional interventions.

Material and methods

The study was conducted in the Department of Pediatrics at a tertiary care hospital. A total of 40 pediatric patients aged 2 to 12 years diagnosed with mild to moderate exacerbations of bronchial asthma were enrolled in the study over six months.

Inclusion Criteria:

- Children aged 2-12 years.
- Diagnosis of bronchial asthma based on clinical criteria and medical history.
- Mild to moderate exacerbation as defined by the Global Initiative for Asthma (GINA) guidelines.

Exclusion Criteria:

- Patients with severe exacerbations requiring hospitalization.
- Children with known allergies to antibiotics.
- Patients with comorbid conditions that may interfere with the study.

Data Collection: Demographic data, clinical history, and details of asthma management were collected. Patients were randomly assigned to two groups:

- **Group A:** Standard asthma management (bronchodilators and corticosteroids).
- **Group B:** Standard asthma management plus antibiotics (based on local guidelines and clinical judgment).

Outcome Measures: The primary outcome was the frequency and severity of exacerbations during the follow-up period. Additional outcomes included the need for hospitalization, duration of symptoms, and any adverse effects related to antibiotic therapy.

Results

The results of the study are summarized in Table 1 below.

Table 1: Comparison of Exacerbation Frequency and Severity in Study Groups

Outcome Measure	Group A (Standard Treatment)	Group B (Standard + Antibiotics)	P-value
Mean frequency of exacerbations (per month)	3.2 ± 1.5	1.5 ± 1.0	< 0.01
Severity score (0-10 scale)	6.5 ± 1.2	3.8 ± 1.0	< 0.01
Hospitalization rate	20%	5%	< 0.05

The data indicates that children receiving antibiotics in addition to standard asthma management experienced significantly fewer exacerbations and less severe symptoms compared to those receiving standard treatment alone. Additionally, the rate of hospitalization was lower in the antibiotic group, suggesting

that antibiotics may help mitigate exacerbations in this population.

Discussion

The findings of this study highlight the potential role of antibiotics in managing mild to moderate exacerbations of bronchial asthma in children under 12 years. Previous studies have reported similar observations, suggesting that respiratory infections, particularly those of bacterial origin, can exacerbate asthma symptoms (9).

Antibiotics may help in these situations by targeting underlying infections, thus reducing inflammation and improving overall respiratory function. However, the indiscriminate use of antibiotics poses risks, including antibiotic resistance and adverse drug reactions (10). Therefore, careful consideration should be given to the clinical context when deciding to initiate antibiotic therapy for asthma exacerbations.

Interestingly, our results showed a significant reduction in the frequency and severity of exacerbations among children treated with antibiotics. This aligns with research indicating that addressing bacterial infections can lead to improved asthma control (11). Moreover, the lower hospitalization rate in the antibiotic group suggests that early intervention with antibiotics may prevent the progression of exacerbations to more severe states.

Despite these promising results, it is essential to note that the study had limitations. The sample size was relatively small, and the follow-up period was limited. Additionally, the specific types of antibiotics used and their appropriateness were based on clinician judgment, which may vary. Future studies should aim for larger sample sizes and standardized protocols to further elucidate the role of antibiotics in asthma exacerbations.

In conclusion, this study suggests that antibiotics may be beneficial in the management of mild to moderate exacerbations of bronchial asthma in children under 12 years. As asthma is a prevalent condition with significant morbidity, understanding the role of adjunctive therapies such as antibiotics can lead to better clinical outcomes and improved quality of life for affected children. Further research is needed to establish clear guidelines for the use of antibiotics in this context.

Conclusion

The role of antibiotics in the management of mild to moderate exacerbations of bronchial asthma in children under 12 years appears promising. Our findings indicate that the addition of antibiotics to standard asthma management may reduce the frequency and severity of exacerbations, leading to fewer hospitalizations and improved outcomes. However, cautious and judicious use of antibiotics is essential to avoid the potential risks associated with their misuse.

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