

Determining the Appropriate Use of Antibiotics for the Treatment of Acute Asthma



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The use of antibiotics in the management of asthma exacerbations is a common practice although the indications for treatment and the benefits of therapy are not well documented. Global Initiative for Asthma (GINA) 2018 states: “Antibiotics should not be routinely prescribed for asthma exacerbations.”¹ This recommendation is based on the absence of consensus criteria for the use of antibiotics during acute worsening of asthma symptoms. Although infection is a common trigger of asthma, most exacerbations from infections are associated with viral pathogens.

Stolbrink et al² describe the demographics of patients, 16 years and older, treated with antibiotics and characteristics associated with receipt of an additional course of antibiotics. GINA in 2018 states: “Evidence does not support a role of antibiotics in asthma exacerbations unless there is strong evidence of lung infection (e.g. fever and purulent sputum or radiographic evidence of pneumonia). Aggressive treatment with corticosteroids should be implemented before antibiotics are considered.”¹ Although Stolbrink et al do not address the appropriateness nor the necessity of the antibiotic prescriptions, their findings do support that patients treated with short antibiotic courses usually recovered without the need for an additional antibiotic prescription. Not addressed in the paper is whether the patients benefitted from the treatment.

The majority of patients studied, approximately 93%, received only once course of antibiotics for 7 or fewer days. The papers by Tattersfield et al³ and Matz et al⁴ looked at the prodrome and recovery phase from asthma exacerbations. Their findings suggest that most patients recover from asthma flares within the similar weeklong timeframe. In the Stolbrink et al paper, the vast majority of patients were treated with either amoxicillin or doxycycline and a small percent with macrolides. Treatment with amoxicillin was as effective as or more effective than the other agents as judged by the need for a second course of antibiotics.

Patients selected for the study were 16 years and older and excluded individuals with chronic obstructive pulmonary disease (COPD). Only 6.5% of patients treated with antibiotics required

a second course of antibiotics and these patients might be considered treatment failures or patients slow to resolve their disease. The second course of antibiotic treatment was typically 7 days. Interestingly, the patients requiring a second course of antibiotics were older, had a significant positive association with smoking status, had greater respiratory disease morbidity in the past year, and had a greater Charlson comorbidity index.⁵ In addition, many of these patients had features of both asthma and COPD, suggesting asthma/COPD overlap syndrome (ACOS). From the data presented, it is difficult to assess the appropriateness of the antibiotic prescription, but this population is more suggestive of ACOS and criteria for antibiotic use may differ from asthma.

What is still needed is specific guidance for the appropriate use of antibiotics in the treatment of acute exacerbations of asthma. A recent Cochrane review of this topic is limited by the absence of studies addressing this topic, the disparity of the cohorts, and age of some of the research.⁶ Randomized clinical trials are limited by patient selection as many patients may be excluded because they have some criteria that might suggest the need for antibiotics.

At present, the guidance focuses on the patient with fever, purulent sputum, or radiographic evidence of pneumonia (guidelines do not recommend routine lung imaging). None of these criteria identify the etiology of the exacerbation or distinguish viral and bacterial trigger. An analysis comparing patients who appear to have an ACOS phenotype to the more classical asthma phenotype may yield further insights.

To address the appropriateness of antibiotics in the treatment of acute asthma, an observational study using electronic health records (EHR) is needed that studies patients with acute worsening of asthma, requiring the frequent use of short-acting β -agonists and oral corticosteroids. These are the basic management principles for treating an asthma exacerbation. Patients treated with and without antibiotics could then be compared. History from the EHR of purulent sputum and fever, as well as measures of lung function, oxygen saturation, and chest radiographs could be analyzed as variables. Hospitalization or other resource utilization could be a selected outcomes measure.

This study in the United Kingdom of primary care practice opens the discussion for the appropriate use of antibiotics in the treatment of acute asthma and the potential of observation databases to address this topic. In the absence of definitive recommendations, it should remind clinicians, whether caring for children or adults, of the need for antibiotic stewardship.⁷ In treating patients with an asthma exacerbation, clinicians should first initiate the primary treatment outlined in guidelines, use of inhaled short-acting β -agonists and oral corticosteroids. Then, if clinically indicated, they should start antibiotic treatment with a first-line antibiotic for 5 days as recommended by recent literature.⁸

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