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Antibiotic Therapy in Preventing Exacerbations of Severe Chronic Obstructive Pulmonary Disease

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Abstract

- COPD is a chronic, slowly developing progressive disease. Symptoms include shortness of breath, wheezing, coughing and frequent respiratory infections.
- Standard pharmacological treatment includes inhaled bronchodilators and corticosteroids (National Heart, Lung, and Blood Institute [NHIBI], 2017).
- In severe cases, adding a macrolide antibiotic to their standard treatment decrease exacerbations and improve overall health and quality of life? Do the benefits of antibiotic therapy outweigh the risks?
- In an effort to answer the above questions, the chosen studies and reviews articles included adults (18 years and older), having a history of moderate to very severe COPD, having one to three acute exacerbations of COPD (AECOPD) in the last year and continuing on standard therapy for COPD.

Introduction

- COPD is a chronic, slowly developing progressive disease. Symptoms include shortness of breath, wheezing, coughing and frequent respiratory infections.
- Standard pharmacological treatment includes inhaled bronchodilators and corticosteroids (National Heart, Lung, and Blood Institute [NHIBI], 2017).

Statement of the Problem

- Patients with severe COPD that have exhausted all modalities of standard treatment, may still suffer from “flare ups” or exacerbations of symptoms which can alter their quality of life and lead to frequent hospitalizations (NHIBI, 2017).

Research Question

1. In patients with severe COPD, are standard pharmacological methods of therapy enough to prevent exacerbations?
2. In patients with severe COPD, what are the benefits of adding a long-term macrolide antibiotic to standard therapy?
3. In patients with severe COPD, what are the risks and contraindications of adding a long-term macrolide antibiotic to standard therapy?

Literature Review

- The literature yielded high-quality studies concerning macrolide antibiotics and their effects, benefits, and challenges in preventing and treating AECOPD.

Discussion

- Current research indicates there is significant improvement in symptom exacerbation for the patients using long-term antibiotic therapy.
- Is standard pharmacological therapy enough to prevent exacerbations?
- Kew, Mavergames and Walters (2013) found that LABAs are effective for moderate/severe COPD. However, mainly Caucasian males were used in their research.
- Are there a benefit to adding long-term antibiotics?
- Seemungal et al. (2014) found a significant reduction in exacerbations for erythromycin versus placebo (35%) (p=0.006). However, the study only had 109 patients.
- Sethi et al. (2010) showed Moxifloxacin given for five days a week reduced exacerbations by 25% and those with mucopurulent sputum had a reduction of 45%.
- What are the risks of long-term antibiotics?
  - Chronic or long-term use of antibiotics will always bring up a concern for bacterial resistance.
  - Albert et al. (2011) found patients using long-term azithromycin showed more resistance to macrolides in respiratory pathogens compared to placebo.
  - Simonet et al. (2013) found no difference in macrolide resistance (azithromycin 52% and placebo 57%) (p=0.64).
  - Ray and colleagues (2012) showed an increase in cardiovascular and all-cause mortality with azithromycin versus placebo.

- As discussed, the data is proving the benefit, but it needs to be used in an appropriate patient population. With all patients involved in this therapy, bacterial resistance is the main risk and concern.

Applicability to Clinical Practice

- Long-term antibiotic use for the prevention and treatment of AECOPD is being minimally used at this point.
- In discussing this topic with Val Tomhave, RRT and supervisor of the Sanford Pulmonary Rehab, she states that three of her patients with severe to very severe COPD are currently using long-term azithromycin therapy with great success.
- The majority of COPD patients (up to two thirds) are non-exacerbators, therefore, not candidates for long-term antibiotics.
- Patients suffering from frequent or severe infective exacerbations despite optimal pharmacological and non-pharmacological treatments would be candidates for long-term antibiotic treatment.
- Primary care providers will inevitably play a pivotal role in the use of this therapy.
- Due to the large push for preventative medicine, primary care will be a major factor by helping patients with smoking cessation, eating a healthy diet, getting regular cardiovascular exercise and overcoming psychosocial barriers to accomplish a healthy lifestyle.

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