

The effects of inhaled fluticasone propionate and budesonide on lung function and exacerbations in patients with chronic obstructive pulmonary disease

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Abstract. Introduction: The prevalence of chronic obstructive pulmonary disease (COPD) continues to increase and is currently the 4th leading cause of death in the U.S. Although a proven and effective treatment for the chronic airway inflammation of asthma, the role of corticosteroids to treat underlying inflammation in COPD is controversial. The purpose of this study is to investigate the effect that inhaled corticosteroids, fluticasone propionate and budesonide, have on lung function and acute exacerbations in patients with COPD. **Methodology:** An evidence based literature review was conducted utilizing Medline, Cochrane Library, and ProQuest databases. **Results:** Nine randomized, controlled trials were found which specifically addressed the objective of this paper. Review of these studies indicates that inhaled fluticasone propionate has a significant effect on decreasing exacerbations, but not on the improvement of lung function. It was also discovered that budesonide had no significant effect on reduction of exacerbations or improvement of lung function. **Conclusions:** The results from this literature review are inconclusive due to conflicting and insufficient data. Therefore, a recommendation for the use of fluticasone propionate or budesonide to improve lung function and decrease exacerbations of COPD cannot be made at this time.

1. Introduction

According to the Global Initiative for Chronic Obstructive Lung Disease (GOLD), options for pharmacological treatment in COPD include bronchodilators and inhaled and systemic corticosteroids.[1] The GOLD guidelines recommend that inhaled corticosteroids may be added to a patient's treatment regimen if their forced expiratory volume in one second is less than 50% and if they experience frequent exacerbations.[1] However, the efficacy of inhaled corticosteroids and their use in the treatment of COPD is still regarded as controversial, because their mechanism of action in COPD is unclear. It is difficult to distinguish whether or not the improvement that inhaled corticosteroids have on COPD patients is due to the drug itself versus an asthmatic component in the patient or the concurrent use of other medications such as bronchodilators. The purpose of this evidence based, systematic literature review is to further investigate the effect that inhaled corticosteroids, specifically fluticasone propionate and budesonide, have on lung function and exacerbations in patients with COPD.

2. Experiment, Results, Discussion, and Significance

A systematic, evidence based literature review was performed utilizing the Medline, Cochrane and ProQuest databases. A bibliographic search of studies used in this literature review was also performed. Inclusion criteria consisted of randomized, controlled trials and meta-analyses that explored the effects inhaled fluticasone propionate or budesonide have on lung function and COPD exacerbations. Studies that included asthmatic participants, inhaled corticosteroids other than fluticasone propionate or budesonide, or those that only looked at systemic steroids were excluded. Nine studies were found that met inclusion and exclusion criteria. Of those nine, five specifically studied fluticasone propionate and four investigated budesonide.

Paggiaro et al (1998) conducted a study to investigate the efficacy of inhaled corticosteroids in the treatment of COPD.[2] It was found that inhaled fluticasone propionate significantly improved lung function and decreased COPD exacerbations.[2] Calverley et al (2003) studied the combined use of salmeterol and fluticasone against either alone in treatment of COPD.[3] The study showed that combination therapy is more effective.[3] However, the fluticasone propionate and placebo arm did show a significant effect on improvement of lung function and decrease in rate of exacerbations.[3] Burge et al (2000) investigated the effect that fluticasone propionate had on lung function, exacerbations, and health status in COPD patients.[4] The results of this study revealed that there.

was no effect on lung function.[4] However, fluticasone propionate did have a significant effect on decreasing COPD exacerbations and reducing the rate of decline in health status.[4] Hattotuwa et al (2002) studied inhaled fluticasone propionate's effect on lung function, symptom scores, exacerbation rates, and the inflammatory cellular profile in COPD patients.[5] Results showed that fluticasone propionate had a significant effect on reduction of exacerbations, had no significant effect on lung function, significantly reduced cough, sputum score, and use of reliever medication, had no significant effect on breathlessness, wheezing, exercise tolerance, or general being, and did not effect the inflammatory cellular profile.[5] Thompson et al (2002) conducted a study to determine the efficacy of inhaled corticosteroids in the treatment of COPD.[6] The findings demonstrated that fluticasone propionate did improve lung function and decrease exacerbations, however, not significantly so.[6]

Renkema et al (1996) studied the effect that inhaled budesonide had on patients with COPD.[7] This study showed that budesonide had no significant effect on lung function or COPD exacerbations.[7] Vestbo et al (1999) conducted a study that investigated the effect that inhaled budesonide had on COPD patients.[8] The primary outcome that was measured in this study was the effect on lung function.[8] Secondary endpoints that were monitored were respiratory symptoms and exacerbation frequency.[8] Results indicated that inhaled budesonide does not have a significant effect on lung function, respiratory symptoms, or exacerbations.[8] Pauwels et al (1999) explored the effects of inhaled budesonide on lung function.[9] Findings from this study showed that lung function was not significantly improved by the use of inhaled budesonide.[9] Maltais et al (2002) compared the effect of oral prednisolone and inhaled budesonide in the treatment of COPD exacerbations.[10] Results indicated that airflow was improved in patients who were experiencing an acute exacerbation of their COPD.[10]

3. Conclusions

The results from this literature review are inconclusive due to conflicting and insufficient data. Therefore, no specific recommendation for the use of fluticasone propionate or budesonide to improve lung function and decrease exacerbations can be made as a result of this investigation.

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