

# Corticosteroids for exacerbations of asthma and copd research paper example

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## - Introduction

Asthma and chronic obstructive pulmonary disease (COPD) are diseases associated with obstruction and chronic inflammation of the airway (respiratory tract). Though the two conditions are separate and different, they are so similar to the extent that misdiagnosis of either condition is highly likely. Some scholars have called for a re-evaluation of the two disorders in terms of their symptomatic differences, their coexistence and their overlap. Gibson and Simpson (2009) extensively studied the overlapping diagnosis of COPD and asthma and introduced the concept of the overlap syndrome. The major difference between the two conditions has to do with the difference in the type of inflammation due to the involvement of different immune cells resulting in the recruitment of different inflammatory cells. While asthma results from acute production of eosinophils, COPD is primarily a culmination of chronic production of macrophages and neutrophils. The distinction is however more blurred in cases of severe asthma, during acute exacerbations and in smoking asthma patients. As such, acute exacerbations are common occurrences in COPD and asthma. While asthma is more common among younger people, COPD is more common among older people though the onset may be earlier in life and progress gradually. COPD is a major cause of mortality and morbidity; ranked the fourth most common global cause of death among the population above 45 years. It is predicted that by 2020 COPD will be the third most common cause of death in the world. The exacerbations in COPD are major causes of death.

## 2. 0 The management of exacerbations in Asthma and COPD

Exacerbations episodes are instances of increased disease severity when the symptoms of the disease seem to flare up and often lead to hospitalization. Sporadic exacerbations are common features in asthma and COPD that become more frequent as the disease becomes more severe. The exacerbation in both asthma and COPD are linked with the non-responsiveness to the initial therapy and if not well-managed can lead to death due to symptomatic complication and increased risk of such as cardiac arrest and stroke (Walters, Gibson, Wood-Baker, Hannay, & Walters, 2009; Donaldson, Hurst, Smith, Hubbard, & Wedzicha, 2010). Approximately 75% of the exacerbation episodes have been associated with bacterial and viral infection while the rest have idiopathic etiology. Smoking increases the frequency and the severity of the exacerbation episodes in these respiratory disorders and thus stopping smoking can reduce the frequency of the episodes.

Acute exacerbations in both diseases is very heterogeneous in terms of symptoms thus complicates diagnosis and treatment. The exacerbation episodes are characterized by hypoxemia, purulence of phlegm, increased phlegm volume, worsened dyspnea, increased coughing, wheezing, sore throats and symptoms of common cold. On the long-term, frequent exacerbation result in sedentary lifestyle, decreased health related quality of life (HRQL), faster rate of decline in respiratory function, significant healthcare resource and even death (Walters, Gibson, Wood-Baker, Hannay, & Walters, 2008).

Exacerbations necessitate emergency treatment, sometimes a change of the patient's medication and sometimes hospitalization for the purposes of

monitoring the efficacy of the treatment. In about 50% of the COPD exacerbation episodes, intensive care is necessary while there are milder episodes that can be managed on outpatient basis. Given the grave long-term effects of exacerbations in asthma and COPD as well as the significant morbidity and mortality associated with these episodes, reduction of the frequency of episodes or prevention of the episodes is a crucial goal of treatment. As such, a lot of attention has been given to the development of strategies to manage, reduce and prevent exacerbations in COPD and asthma. Some of the strategies include supplemental oxygen in the initial therapy, administering inhaled bronchodilators, antibiotics to deal with the underlying bacterial infection and corticosteroids. In addition, immune modulators such as Mepolizumab have been used in management of asthma exacerbations associated with eosinophilic airway inflammation. Lastly, the increased risk of stroke and myocardial infarction associated with COPD exacerbations has informed the administering of drugs for prevention of cardiovascular disease both during the normal course of the disease and during the flares (exacerbations)

### 3. 0 Corticosteroids and exacerbations

Short-term, higher than usual dose of corticosteroids is a common treatment that has been recommended for the treatment of exacerbations in asthma and COPD for decades. In theory, corticosteroids should reverse the respiratory inflammation, mucus hypersecretion and constriction of the airway associated with COPD and asthma (Walters, Gibson, Wood-Baker, Hannay, & Walters, 2008). However, corticosteroids simply alleviate the symptoms and thereby reduce the severity of the disease by restoring the

baseline respiratory function of the patient. An extensive literature review by Schweiger and Zdanowicz (2010) revealed that the use of systemic corticosteroids in treating COPD exacerbations has several benefits. The said study revealed that these drugs improve symptoms, improve airflow, decrease the length of hospital stay, reduce the risk of relapse and treatment failure rates. In addition, corticosteroids reduce the recovery time by an average of 2.63 days and increase the frequency of exacerbations (Walters, Gibson, Wood-Baker, Hannay, & Walters, 2008). The pathological similarities between asthma and COPD have informed the use of corticosteroids in the management of exacerbations in both conditions and the management has been reported to be effective in both cases. As such, the Global Initiative for Chronic Obstructive Lung disease (GOLD) recommends corticosteroids for the treatment of COPD exacerbation. However the consensus guidelines (provided by GOLD) on the duration of therapy, the dosage and the routes of administration corticosteroids are based on unreliable data.

Several studies indicate that inhaled, parenteral, intravenous and oral corticosteroids are effective in the treatment of COPD exacerbations (Walters, Gibson, Wood-Baker, Hannay, & Walters, 2008; Walters, Gibson, Wood-Baker, Hannay, & Walters, 2009; Suissa & Barnes, 2009; Cosio, et al., 2009; Schweiger & Zdanowicz, 2010). The probable side effects associated with systemic corticosteroids such as hypertension, osteoporosis, fluid retention, adrenal suppression and diabetes mellitus saw the move to increased use of inhaled corticosteroids. While the inhaled corticosteroids were mainly used in asthma exacerbation (due to the increased efficacy),

they were easily adopted for COPD exacerbations and have been shown to be equally effective (Walters, Gibson, Wood-Baker, Hannay, & Walters, 2008; Suissa & Barnes, 2009). Some of the corticosteroids used for the treatment of the asthma and COPD are methylprednisolone, prednisone, hydrocortisone and prednisolone. In addition, corticosteroids have been used in combination with some antibiotics and  $\beta$ -agonist to enhance efficacy.

In conclusion, there are several strategies employed in the management of exacerbation of asthma and COPD. However, corticosteroids remain the most effective and have been used for decades. They can also be combined with antibiotics and  $\beta$ -agonist to improve the treatment outcome.

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