

European Respiratory Society Annual Congress 2013

Abstract Number: 647

Publication Number: P3651

Abstract Group: 1.1. Clinical Problems

Keyword 1: COPD - management **Keyword 2:** Bronchodilators **Keyword 3:** No keyword

Title: Effects of ciclesonide on the management of stable COPD with airway eosinophilia

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Body: Rationale: Although neutrophil inflammation in airways is generally considered as the principle pathophysiology in COPD, eosinophil inflammation in the airways is observed in some patients with this disease independent of asthma. Little is currently unknown about not only mechanisms but also therapy in this clinical phenotype of COPD. This clinical study was designed to determine whether inhaled glucocorticosteroids (ICS) are useful for airway eosinophilia in COPD. Methods: In stable COPD by indacaterol (LABA), when a percentage of eosinophil (Eo) in the induction sputum is >3%, ciclesonide (ICS) was administered because this agent is delivered to distal airways due to smaller particle size. In contrast, ICS was not added when Eo value is <3%. Results: 15 patients with COPD (GOLD 2-3) with airway eosinophilia were enrolled. Symptoms and lung function in all of these cases have been already improved by indacaterol. COPD Assessment Test (CAT) score was decreased to 7.2 and inspiratory capacity was increased by 310 mL. However, ciclesonide was added to 6 cases because of sputum Eo >3% (8.1%). After administration of ciclesonide, values of Eo and CAT were decreased to 2.1, and 4.8, respectively (each $P < 0.05$). During observation for one year, exacerbation did not occur in these cases. On the other hand, in 9 cases who were not administered ciclesonide because of sputum Eo <3% (1.8%), exacerbation due to a deterioration of airway eosinophilia developed in 2 cases of them. Conclusions: Not only LABA but also ICS is needed to achieve better maintenance in COPD with airway eosinophilia. Ciclesonide is effective for these cases. Eosinophil infiltration to airways is indication of ICS therapy for COPD.