Effect of Inhaled Long Acting Muscarinic Anticholinergic Antagonist (LAMA) on Lung Function in Stable Bronchiectasis

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Background: Bronchiectasis is a chronic inflammatory airway disease characterized by permanent bronchial dilatation and recurrent episodes of infection and exacerbation, leading to further airway damage. Patients suffer from chronic respiratory symptoms such as daily productive cough, breathlessness and frequent exacerbation, resulting in poor quality of life. LAMA is an inhaled potent bronchodilator to alleviate dyspnea by reducing air-trapping. Its anticholinergic properties also decrease mucin production.

Objective: We established a randomized controlled trial to evaluate effects of LAMA on pulmonary function in bronchiectasis.

Methods: All cases of symptomatic bronchiectasis were enrolled into the study. Diagnosis of bronchiectasis was identified by computed tomography. Patients were blindly randomized to receive inhaled LAMA (tiotropium bromide, Spiriva® handihaler) or inhaled placebo. Pulmonary function and hyperinflation were evaluated by using body plethysmography, six minute walking test. SGRQ was used for measurement of quality of life. The primary outcome was the change from baseline to 12-week follow up of FEV1 (L). Other outcomes included the change of SGRQ score, change of residual volume, six minute walk distance after 12 weeks, and side effects.

Results: A number of 20 stable bronchiectasis patients in King Chulalongkorn Memorial Hospital during May - December, 2017 were included. Most of them were female (80%). The mean (SD) age was 61.88 (9.86) and 62.67 (7.28) years in LAMA and placebo groups, respectively. The etiologies of bronchiectasis were idiopathic (60%), post-infection (30%), and connective tissue related (5%). The spirometry pattern was normal (35%), obstructive (30%), mixed obstructive-restrictive (20%), and restrictive (15%). Hyperinflation was detected by increased of RV/TLC ratio in 19 cases (95%), even no obstructive defect shown. The average improvement of pre-bronchodilator FEV1 after 12-week follow up was 88.75 ml (p-value = 0.022) in Spiriva group and 46.36 ml (p value 0.354) in placebo group, respectively. The SGRQ score (symptom) significantly decreased from baseline of 12.59 (p-value = 0.039) after 12 weeks in the Spiriva group. No major side effect was reported.

Conclusion: Inhaled long acting muscarinic anticholinergic antagonist (LAMA) might be beneficial in symptomatic bronchiectasis for improvement of pulmonary function impairment and chronic respiratory symptoms.

Keywords: Bronchiectasis, Bronchodilator, LAMA, Spiriva, Lung function