

**Disease modifying effects of simvastatin &/or
telmisartan on pulmonary function in patients with
mild to moderate chronic obstructive pulmonary
disease(COPD)**

Abstract

Background: Chronic obstructive pulmonary disease (COPD) is characterized by chronic airflow limitation and a range of pathological changes in the lung, some significant extra-pulmonary effects, and important comorbidities which may contribute to the severity of the disease in individual patients. Many immune, inflammatory and oxidative stress markers were found to be involved in the pathogenesis of COPD and inhibition of which was related to improved pulmonary function in these patients.

Objective: The aim of this study is to evaluate the anti-inflammatory, antioxidant and immunomodulatory effects of simvastatin, telmisartan or their combination on pulmonary function in patients with COPD.

Subjects and methods: Eighty patients with mild to moderate COPD according to GOLD standards criteria were participated in this study. They were recruited into four groups where the first group includes 20 patients on an inhaled β_2 -agonist only (control), the second group includes 20 patients on an inhaled β_2 -agonist plus 20mg/d simvastatin, the third group includes 20 patients on an inhaled β_2 -agonist plus 40mg/d telmisartan and

the fourth group includes 20 patients on an inhaled β_2 - agonist plus combination of both simvastatin and telmisartan. Twenty apparently healthy subjects were selected to be a normal group for comparison. Baseline , 3 and 6 months periods were used to monitor patients. Pulmonary function tests were measured by a spirometer (spirolab III) as forced expiratory volume in the first second (FEV1), forced expiratory flow at 25-75% of the forced vital capacity (FEF25-75%), peak expiratory flow (PEF) and forced expiratory volume in the third second (FEV3). In addition, assessing the plasma levels of tumor necrosis factor alpha (TNF- α), malonyl dialdehyde (MDA) as markers of inflammation and oxidative stress was performed. ANOVA method for statistics was used to compare the results.

Results: The results showed that treatment with simvastatin, telmisartan and combination of both was associated with improved pulmonary outcomes by affecting the inflammatory and oxidative stress processes and this indicated by improvement in FEV1, FEF25-75%, PEF and FEV3, and reduction of TNF- α and MDA. However, the most effective therapy was with the combination of both simvastatin and telmisartan.

Conclusion: The anti-inflammatory, antioxidant effects of simvastatin and telmisartan were associated with improved pulmonary function and there may be a potentiation effect between statins and angiotensin receptor blockers (ARBs) that require further approval.

Key words: Statins, Angiotensin receptor blockers, COPD.