

# Investigation of Airway Inflammation and Pulmonary Function in Patients with Severe Obstructive Sleep Apnea

Pei-Chun Lin<sup>1</sup> Pei-Lin Lee<sup>2,3</sup> Hui-Dung Wu<sup>2,4</sup> Ya-Hui Chuang<sup>5</sup> Li-Ying Wang<sup>1</sup>

**Background and Purpose:** Obstructive sleep apnea (OSA) is characterized by episodes of repetitive upper airway obstruction during sleep. Evidence of both systemic and airway inflammation had been found in patients with OSA. However, the relationship between airway inflammation and pulmonary function remains unclear. The objective of this study were (1) to evaluate the degree of airway inflammation by induced sputum in patients with severe OSA, and (2) to investigate the correlations between airway inflammation, disease severity, and pulmonary function parameters. **Methods:** Twenty treatment-naïve patients with severe OSA (mean age: 50.35±8.95 y/o) were recruited. Spirometry was used to evaluate pulmonary function and airway inflammation was assessed by induced sputum. Pearson correlation coefficient was used to explore the correlations between parameters. **Results:** The mean FVC (102.72±11.10% of predicted) and FEV<sub>1</sub> (97.78±12.03% of predicted) of all subjects were within normal range, and the mean FEV<sub>1</sub>/FVC ratio was 77.20±3.43%. Compared to healthy population, the FEF<sub>25-75</sub> was relatively low in patients with severe OSA (68.70±14.40% of predicted). The mean cell concentration in induced sputum was 2.01±1.37×10<sup>6</sup>cells/ml. The neutrophil and macrophage percentage in induced sputum was 59.20±20.94% and 30.04±20.67%, respectively. Significant positive correlation between AHI and neutrophil percentage was found ( $r=0.45$ ,  $p<0.05$ ), and AHI was negatively correlated with macrophage percentage ( $r=-0.45$ ,  $p<0.05$ ). No significant correlation was found between inflammatory markers and pulmonary function parameters in the study population. **Conclusions:** Airway inflammation existed in patients with severe OSA, which was characterized by a higher neutrophil and a lower macrophage percentage. Disease severity was found to moderately correlate with airway inflammation. Lower FEF<sub>25-75</sub> predicted value suggested that it is necessary to evaluate the small airway function of these patients longitudinally. (FJPT 2010;35(1):16-23)

**Key Words:** Obstructive sleep apnea, Inflammation, Pulmonary function

<sup>1</sup> School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University, Taiwan.

<sup>2</sup> Department of Internal Medicine, National Taiwan University Hospital, Taipei, Taiwan.

<sup>3</sup> Center of Sleep Disorder, National Taiwan University Hospital, Taipei, Taiwan

<sup>4</sup> Department of Integrated Diagnostics and Therapeutics, National Taiwan University Hospital, Taipei, Taiwan.

<sup>5</sup> School and Graduate Institute of Clinical Laboratory Sciences and Medical Biotechnology, National Taiwan University, Taiwan.

Correspondence to: Li-Ying Wang, 3F, No.17, Xu-Zhou Road, School and Graduate Institute of Physical Therapy, College of Medicine, National Taiwan University, Taipei City 100, Taiwan.

Tel: (02) 33668142 E-mail: liying@ntu.edu.tw

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