**International Conference 'Advances in Pneumology'**
**Bonn, 17-18 June 2011**

# HYPOXEMIA DURING BILEVEL POSITIVE AIRWAY PRESSURE TREATMENT IN PATIENTS WITH OBSTRUCTIVE SLEEP APNEA SYNDROME AND CHRONIC RESPIRATORY INSUFFICIENCY

**Anna Brzecka, Pawel Piesiak, Monika Kosacka, Renata Jankowska**

Department of Pulmonology and Lung Cancer, Medical University in Wrocław, Poland

**INTRODUCTION AND THE AIM OF THE STUDY:** In a minority of patients with obstructive sleep apnea (OSA) syndrome chronic respiratory insufficiency develops, usually as a consequence of chronic alveolar hypoventilation. One of the options of the treatment of the patients with OSA syndrome and chronic alveolar hypoventilation is bilevel positive airway pressure (BPAP) during sleep with or without additional oxygen. It is not known, however, which patients benefit from this treatment. Thus, the aim of the study was to find out which factors influence the results of BPAP treatment in the patients with OSA syndrome and chronic alveolar hypoventilation. **MATERIAL AND METHODS**: Material of the study consisted of 55 adult patients (12 women) with obesity (body mass index >30 kg/m2, mean 46±7 kg/m2) and OSA syndrome (apnea/hypopnea index >30, mean 62±18), and chronic respiratory insufficiency (PaCO2>45 mmHg, mean 54±5,6 mmHg). In all patients polysomnography was performed with BPAP treatment and additional oxygen – when indicated (sustained SaO2<88%). The aim of adequate BPAP titration was to eliminate all the obstructive apneas and hypopneas and to obtain maximal possible SaO2. **RESULTS**: The mean SaO2 during BPAP treatment was 87±5% in NREM sleep and 85±8% in REM sleep. In 31 patients (56%) the mean SaO2 during sleep was <88% despite optimal BPAP and oxygen titration: 83±4% during NREM sleep and 81±7% during REM sleep vs 91±2% and 90±3%, respectively, in the remaining patients ($p<0,001$). In 18 patients (33%) there was sustained severe hypoxemia (mean SaO2<85%) during BPAP treatment: 81±4% in NREM sleep and 72±10% in REM sleep. All but one women belonged to this group. The patients with severe hypoxemia during sleep and BPAP treatment had lower vital capacity (VC), lower diurnal PaO2 and higher PaCO2 as compared with remaining patients (2,0±0,8 l vs 2,8±0,9 l, $p<0,05$; 49±7 mmHg vs 54±8 mmHg, and 57±5 mmHg vs 52±6 mmHg, $p<0,01$, respectively). **CONCLUSION:** In approximately 1/3 of the obese patients with severe OSA syndrome and chronic respiratory insufficiency severe sleep hypoxemia persists during optimally titrated BPAP machine and with additional oxygen delivery. The female patients and the patients with low VC and severe chronic alveolar hypoventilation in the course of OSA syndrome are at risk of sustained and severe hypoxemia during sleep despite optimal BPAP titration.