European Respiratory Society
Annual Congress 2012

Abstract Number: 3669

Publication Number: P3875

Abstract Group: 4.2. Sleep and Control of Breathing

Keyword 1: Sleep studies **Keyword 2:** Apnoea / Hypopnea **Keyword 3:** Circulation

Title: Cardiovascular regulation effects of CPAP therapy in obstructive sleep apnea patients with and without hypertension during daytime

Prof. Dr Thomas 21316 Penzel thomas.penzel@charite.de [1], Mr. Christoph 21317 Schöbel christoph.schoebel@charite.de MD [1], Ms. Carmen 21318 Garcia carmen.garcia@charite.de MD [1], Mr. Martin 21319 Glos martin.glos@charite.de [1], Dr. Niels 21322 Wessel niels.wessel@charite.de [2] and Prof. Dr Ingo 21320 Fietze ingo.fietze@charite.de MD [1]. [1] Sleep Medicine Center, Charité Universitätsmedizin Berlin, Berlin, Germany, 10117 and [2] Cardiovascular Physics, Department for Physics, Humboldt Universität Berlin, Berlin, Germany, 10117 .

Body: Obstructive sleep apnea can cause changes in cardiovascular regulation during the night and during daytime. Altered regulation may not be visible in absolute values of heart rate and blood pressure but in a changed coupling between the heart beat and the respiration. In a controlled randomized study we investigated effects of CPAP therapy on daytime cardiovascular regulation. Twenty-eight patients with OSA in total, thereof 18 with arterial hypertension and 10 with normal blood pressure, were studied at baseline and at a follow up date with three months of CPAP. Ten age and sex matched healthy control subjects were investigated using the same protocol. All subjects underwent cardiorespiratory polysomnography. In addition we recorded 20 minutes quiet breathing at rest and a bicycle ergometry with ECG and blood pressure (Portapres). Cardiorespiratory coupling was investigated using symbolic coupling traces, a new developed technique which can reveal causality between signals. The stress test showed a significant reduction of the diastolic blood pressure at a work load of 50W and 100W ($p<0.05$ and $p<0.01$, respectively) and a decrease of the heart rate recovery time after the stress test ($p<0.05$). The results indicate a reduction of vascular resistance and sympathetic activity during daytime. The coupling analysis of the resting periods by means of symbolic coupling traces approach indicated an effect of the CPAP therapy on the baroreflex reaction in hypertensive patients where influences of the systolic blood pressure on the heart rate changed from pathological patterns to adaptive mechanisms of the normotensive patients ($p<0.05$).