

THE IMPACT OF SLEEP APNEA SYNDROME ON OXIDANT-ANTIOXIDANT BALANCE IN THE BLOOD OF OVERWEIGHT AND OBESE PERSONS

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Introduction: Oxygen free radicals are considered to be involved in pathobiochemistry of cardiovascular diseases. The discussion on cessation of breathing-related oxidative stress may explain coexistence of sleep apnea syndrome and a cardiovascular disease. **Aim:** This study was designed to assess chosen blood antioxidant markers in persons with excess body mass index (BMI) with and without obstructive sleep apnea (OSA) diagnosis. **Methods:** White overweight (BMI-1: 25.0-29.9 kg/m²) and obese (BMI-2: 30.0-34.9 kg/m²) non-smoking Caucasians with no acute or chronic disorder were qualified for the study. OSA suspected persons underwent overnight polysomnography with a Poly-Mesam device. The control (C) group was BMI and blood pressure-matched with no OSA. Newly diagnosed type-2 diabetics diagnosed with an oral glucose tolerance test were excluded. We formed two BMI-1 groups: BMI-1-C subjects (n=19, age 53±7; 9 females, 10 males), BMI-1-OSA subjects (n= 20, age 54±6; 8 females, 12 males) and two BMI-2 groups: BMI-2-C persons (n=20, age 49±7; 9 females, 11 males) and BMI-2-OSA patients (n=21, age 51±7; 7 females, 14 males). After an overnight fast, the following parameters were determined: concentrations of plasma lipids: T-C, TAG, HDL-C, LDL-C (bio Mérieux, UV-160A Shimadzu); concentration of plasma total antioxidant status, TAS (Randox, StatfaxTM 1904 Plus); activity of erythrocyte Cu, Zn-superoxide dysmutase, SOD (Randox, StatfaxTM 1904 Plus); plasma lipid peroxidation products measured as a concentration of thiobarbituric acid reacting substances, TBARS (Yagi method, Specord M40). A statistical analysis was performed using STATISTICA 5.0 for Windows. Data were shown as means ± SD. **Results:** I. BMI-1-OSA patients presented decreased SOD as compared with BMI-1-C persons (1022±476 vs. 1381±511 U/g ; p=0.006). BMI-2-OSA patients presented both SOD (1085±418 vs. 1601±535 U/g ; p=0.002) and TAS (1.14±0.27 vs. 1.35±0.21 mmol/l; p=0.047) decreased, and elevated TBARS (12.3±9.86 vs. 6.77±3.35 μmol/l; p=0.027) comparing with BMI-2-C subjects. II. Control subjects of BMI-1-C group had the calculated correlations TAS to SOD (r=0.49) and TAS to TBARS (r= -0.58). In BMI-2-Controls the correlation of TAS to TBARS (r= -0.72) was observed. **Conclusion:** Obstructive sleep apnea syndrome decreases the blood antioxidant status of persons with high BMI and may change the oxidative stress markers relationships.