

## ACTIVITY OF SUPEROXIDE DISMUTASE-1 IN ERYTHROCYTES IN THE BLOOD OF OBSTRUCTIVE SLEEP APNEA PATIENTS

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**Background:** Antioxidant function of Cu, Zn-superoxide dismutase (SOD-1) is important to limit an oxidative stress-related cardiovascular pathology. The factors affecting erythrocyte SOD-1 activity, when documented in obstructive sleep apnea (OSA) patients, could improve the clinical management of OSA pathology. The aim of the study was to analyze the activity of erythrocyte Cu, Zn-superoxide dismutase (SOD-1) along with serum copper and zinc concentrations and oxidase activity of ceruloplasmin (Cp-a) in the blood of different stage-OSA patients. **Methods:** Excessive body mass non-smoking Caucasians suspected of OSA, without any acute or chronic disease, were subjected to clinical, biochemical and full-night polysomnographic examinations. Males aged 35-65 with body mass index (BMI) 25,0-40,0 were included into the study. EMBLA S4000 system was used to establish the apnea/hypopnea index (AHI) and to divide patients into groups: OSA1 with AHI 5-15 (n=20); OSA2 with AHI 16-30 (n=20); OSA3 with AHI ≥31 (n=20). The control, C (n=24) group was composed of age, BMI and glycemic status-similar individuals with no OSA suspicion. Oral glucose tolerance test (OGTT), fasting plasma lipid profile, including T-C, HDL-C, LDL-C, TG, and serum insulin were estimated. The results of OGTT were used to exclude dysglycemic individuals from the study. After overnight fast the subjects were determined: an activity of erythrocyte Cu, Zn-superoxide dismutase, SOD-1 using Randox reagent kit and spectrophotometer Statfax<sup>TM</sup> 1904 Plus), serum copper (Cu) and zinc (Zn) concentrations by atomic absorption spectrometry (Zeiss AAS-3) and oxidase activity of serum ceruloplasmin (Cp-a) by Schosinsky's method (Sigma reagents, Specord M40). Statistical analysis was performed using Statistica 10.0 program for Windows. **Results:** (1) The study participants presented similar age, blood pressure, glucose metabolism and lipid parameters. Comparing with control group, OSA patients were found decreasing activities of SOD-1 from OSA-1 to OSA-3 subjects. Increased activities of serum ceruloplasmin were observed in OSA-1 and OSA-2 groups, although the highest serum copper concentrations were observed in OSA-1 subjects. The tendency to decrease Zn concentrations in moderate and severe OSA was observed. (2) The groups of OSA patients were found different relationships between metabolic parameters and SOD-1, Cp-a and trace elements, respectively, as far as mutual correlations on the above parameters. **Conclusions:** The activity of erythrocyte SOD-1 in normoglycemic OSA patients reflects the personal, intracellular antioxidant status, however metabolic factors, including essential for SOD-1 trace elements, along with the associated protein - ceruloplasmin, may mediate the OSA influence on the enzyme activity.