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Temat pracy: „*Produkty oksydacji w ślinie pacjentów z otyłością olbrzymią poddanych leczeniu bariatrycznemu*”

SUMMARY

Morbid obesity is closely linked with body-mass index (BMI $\geq 40 \text{ kg/m}^2$ or $\geq 35 \text{ kg/m}^2$ associated with co-morbidities). Nowadays obesity is a major problem concerning adults, adolescents and children. Morbid obesity may lead to insulin resistance, type 2 diabetes or hypertension. In the pathogenesis of complications of morbid obesity increasingly important role attributed to oxidative stress (OS). This is a condition characterized by increased amounts of reactive oxygen species (ROS). OS is a result of an imbalance between production and neutralize ROS. Under physiological conditions, free radicals are formed from molecular oxygen in the process of cell respiration or oxidation reactions catalyzed by NADPH oxidase, xanthine oxidase or L-aminoacid oxidase. At physiological concentrations, ROS plays an important role in the cells, for example they participate in signal transmission intra- and intercellular. At concentrations in excess of physiological lead to oxidation of macromolecules such as proteins, lipids, DNA.

In the study participated 40 patients with morbid obesity from 1st Department of General Surgery and Endocrinology UMB, with body mass index $\text{BMI} > 40$, age 35-55 years. Patients with type 2 diabetes, diseases of the cardiovascular system, rheumatoid arthritis, smoking and taking drugs, medical products and food supplements that affect the secretion of saliva and its oxidative status were excluded from the study. The study was approved by the Ethics Committee at the Medical University of Bialystok (permission number R-I-002/175/2012).

A control group matched for gender and age were patients treated in the Department of Conservative Dentistry (non-smoker, generally healthy with BMI in the range 18-25). Obtained written permission to use the results. Patients with morbid obesity underwent a routine medical screening before and 6 months after bariatric surgery.

The material was unstimulated and stimulated saliva (100 μL 2% citric acid on the posterior part of a tongue every 30 seconds at 5min) collected by spitting directly into plastic centrifuge tubes placed on ice in an amount of 3-5mL during 15 minutes. Collecting

was conducted 1-3 hours after cleaning teeth, taking fluids and food. Thereafter, the material was centrifuged for 20 minutes at 12,000 x g at 4°C. For further analyzes supernatant was stored at -20°C, and after 24 hours at a temperature of -80°C. On the day of marking material was thawed and kept at + 4°C before the test. To minimize the error marking tests were done at the same time.

In the obtained saliva determined: 1) the concentration of lipid peroxidation products (ELISA: 4-hydroxynonenal complexes with proteins (4-HNE protein adduct), 8-isoprostanes (8-izoP)), 2) the concentration of oxidation products of proteins (ELISA-advanced oxidation protein products (AOPP), by colorimetric- protein carbonyls (PC), 3) bicinchoninic acid method - total protein concentration, 4) product of oxidation of DNA (ELISA: 8-hydroxydeoxyguanosine (8-OhdG)), 5) total antioxidant status TAS (colorimetric method), 6) total oxidant status TOS (colorimetric method), 7) oxidative stress index OSI (calculated from TOS/TAS x 100 formula).

Statistical analysis was performed using Statistica 10.0 - parametric tests, the significance was defined as $p < 0.05$.

Conclusion:

1. In the course of morbid obesity in the mouth comes to the occurrence of oxidative stress as evidenced by the increased value of the TOS and OSI indicator that speak of the superiority of oxidative processes.

2. After bariatric surgery reduces the severity of oxidative processes by which we conclude on the basis of the reduced rate OSI and the level of TOS which proves the success of the therapy, but they will not reach the corresponding control group.

3. Treatment by bariatric surgery increase antioxidant barrier which show increased values for TAS in patients 6 months after surgery.

4. obese patients before surgery have reduced secretion of saliva, which returns to normal after bariatric surgery.

5. In the course of morbid obesity increased lipid peroxidation manifestes by the increased amount of 8-IsoP and 4-HNE patients before surgery compared to results in patients after surgery and the control group.

6. Obesity increases the oxidation of proteins, indicating an increased level of AOPP and PC in patients before surgery compared to results in patients after surgery and the control group.

7. Obesity causes an increase in DNA oxidation, which is manifested by an increased level of 8-OHdG in patients before treatment compared to results in patients after surgery and the control group.