

EFFECTS OF CARBONATED SOFT DRINKS ON METABOLIC FUNCTION OF LIVER

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Introduction. Carbonated soft drinks consumption reportedly leads to cardiometabolic risk factors, such as hypertension, impaired glucose tolerance and chronic kidney disease. Moreover, some scientific works have shown that carbonated drinks contain methylglyoxal, which is a highly reactive carbonyl compound and major precursor of advanced glycation end products and displays toxicity in cells and tissues.

Moreover, carbonyl stress caused by the accumulation of reactive carbonyl compounds is also associated with hypertension, diabetic complications and uremic states, and carbonyl stress plays a pathological role in these diseases. Therefore, whether the intake of carbonated soft drinks affects the carbonyl stress burden is of clinical importance.

Aim. To investigate the effects of carbonated soft drinks on metabolic function of liver in organism of rats.

Materials and methods. All experiments were conducted on 12 white non-linear rats mass $230,0 \pm 20$ g, which were divided into 2 groups (6 rats at each group): I group – intact animals (water was introduced) and II group – rats which injected carbonated soft drink (such as Coca-Cola) in volume 160 ml per one rat. We chose this dose by such calculation: on average, a person uses carbonated soft drink 1 liter per day, taking into account the amount of sugar in the drink, we calculated that one rat can drink 160 ml of carbonated soft drink (is equivalent to a human). The term of the experiment was 2 weeks.

The blood plasma was obtained after decapitation of rats, which was carried out under ethaminal-sodium anesthesia. In the blood plasma we determinate the concentration of total protein and level of carbamide. Also we calculate ratio of total protein/carbamide.

All experiments were carried out according to the principles of the Declaration of Helsinki, which relate to the conduct of ethical research on laboratory and other animals. For statistical data processing we used the nonparametric Mann-Whitney test.

Results and discussion. We established that drinking the carbonated soft drink due to the changes in their body weight. In animals of 2nd experimental group the body mass increased on 10,0 % compared to the intact group.

We investigated that in experimental group the amount of total protein decreased on 36,0 % ($p \geq 0,05$) compared to the control group. Proteinogram changes proceeded against the background of a decrease in the blood of rats of carbamide concentration on 1.7 times ($p \geq 0,05$), providing an increase in the value of the index characterizing the ratio of concentrations between total protein and carbamide. The totality of changes in the protein parameters of the blood characterized the «catabolic» orientation of protein metabolism in the rats' body, a decrease in the urea-forming activity of hepatocytes and the body's defenses, development in the liver of signs of mesenchymal-inflammatory syndrome.

Conclusion. Thus, the results of our studies showed that during two-week use of carbonated soft drinks, the weight of the rats' body was increased. Also in the rats' organism were prevailed the catabolic processes as a result of changes in the functional and metabolic activity of hepatocytes.