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GLUTATHIONE STATUS IN RAT'S LIVER EXPERIMENTALLY INDUCED UNDER INFLUENCE CHROMIUM CITRATE

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Introduction. The trace elements can affect the glucose metabolism and have an effect on the oxidative stress in diabetes mellitus (DM) type 2. Chromium, as a trace element, improves glucose tolerance, plays an important role in metabolism of carbohydrates, proteins, fatty and nucleic acids. Results of the research indicate that adequate chromium intake may be important for the prevention of DM (Martin J. et al., 2006).

The aim of the research was to find out the effect of various amounts of the organic compound of chromium citrate on glutathione status in the liver tissue of rats with alloxan-induced diabetes.

Methods. Rats weighing 100–120 g were divided into 4 groups: I - control, II, III, IV – research. Rats from groups I and II were given pure water without any additives; animals from groups III and IV were given water with the solution of chromium citrate in the amounts of 0.1 and 2.0 mg/ml of water during one month. Experimental diabetes mellitus (EDM) was induced in the animals from groups II, III, IV after a 24-hour fasting period by intraperitoneal administration of 5% solution of alloxan monohydrate in the amount of 150 mg/kg of body weight.

Results. The content of reduced glutathione (GSH) and the activity of glutathione peroxidase (GPx) decreased significantly by 68.04 and 28.43% respectively during EDM. While the activity of glutathione reductase (GR) significantly increased compared to the control group.

GSH and activity of GPx increased significantly in group III by 112.2 and 63.64% and in group IV – by 26.69 and 20.40% compared to the group with EDM under the influence of vanadium citrate.

When chromium citrate was administered into the drinking water of rats, activity of GR decreased significantly in groups III and IV by 29 and 45.56% compared to group II.

Discussion. Induction of DM in group II determines the excessive formation of reactive oxygen species (ROS), which interacting with others compounds, lead to the development of oxidative stress and inhibition of the activity of the glutathione link of antioxidant defense. In particular the decreased content of GSH and activity of GP.

Chromium citrate as an additive stabilizes the activity of antioxidant enzymes. Obviously, chromium, as a mediator of insulin, has the ability to increase glucose uptake by cells and also exacerbates the expression of the synthesis of antioxidant enzymes (Anderson R., 2007).

Conclusions. Administration of chromium citrate helps to restore the balance between the formation of ROS and the activity of antioxidant enzymes. Chromium citrate can be used to prevent the onset of secondary diabetic complications.

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