

УДК 577.118:612.122:614.449

**THE METABOLISM OF GLUCOSE IN THE BLOOD OF RATS ACCORDING TO THE EXPERIMENTAL INDUCED DIABETES AND ITS CORRECTION OF DIFFERENT DOSES OF CHROMIUM.**

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The influence of chromium citrate on the carbohydrate metabolism in rats with Streptozocin-induced diabetes was investigated. The research was implemented on white laboratory rats body weight from 150 to 170 g, which were held in the Institute of Animal Biology NAAS' vivarium and were divided into four groups: I — control group, II, III, IV — research groups. An experimental diabetes mellitus (EDM) was induced by intravenous injection of Streptozocin («Sigma», USA) in a dose of 35 mg/kg body weight after 24-hour starvation. Hyperglycemia was detected by measuring sugar level in blood taken from a tail vein with a glucose meter. A chromium citrate solution in a quantity of 10 and 25 mcg Cr<sup>3+</sup>/kg body weight was added to a ration of animals with hyperglycemia in III and IV groups respectively.

It was discovered that blood glucose and glycated hemoglobin levels were increasing in rats from II group with EDM comparatively with those levels in rats from I control group. Meanwhile, the adding of the chromium citrate in a quantity of 10 and 25 mcg/kg body weight decreased blood glucose and glycated hemoglobin levels in rats from III and IV groups in comparison to those levels in animals from II group.

The hemoglobin blood concentration was practically the same in animals from II and I groups. This may demonstrate the ability of erythroid cells to synthesize the sufficient amount of hemoglobin even in a state of an insulin deficiency. However, it should be pointed out that the hemoglobin blood concentration in animals from IV group was lower than in II group. It may demonstrate the inhibition of hemoglobin synthesis by an iron deficiency which may go with a lowered ability of blood to carry oxygen to tissues. Fe is transported by a transferrin and acts as a Cr competitor.

Glucose may be received by the erythrocyte independently from insulin and metabolized in glycolysis and pentose phosphate pathways. The activity of one of the glycolysis enzymes — lactate dehydrogenase — was increased insignificantly in animals from II group comparatively to its activity in animals from I group. The activation on the lactate dehydrogenase in erythrocytes might be stipulated by increase of a M-type monomers fraction of an isoenzyme structure and leads to the increase of a lactate blood level as to a pyruvate blood level in animals from II group in comparison to animals from I group. The lactate dehydrogenase activation demonstrates the mobilization of energy resources for a highest possible synthesis of ATP molecules, needed for intracellular processes, transmembrane transport of cations and preservation of membrane's integrity. The increase of a lactate/pyruvate ratio is an index of a degree of cellular metabolism disorder. Since the pyruvate is a precursor of acetyl-CoA, primary substrate of TCA cycle, the decrease of its blood concentration in animals with EDM causes the decrease of general substrate flow in this cycle. Meanwhile, when chromium citrate was added to rats' from III and IV groups ration, the lactate blood level and the lactate dehydrogenase's activity decreased, while the pyruvate blood level increased in rats from III and IV groups comparatively to rats from II group. This indicates the normalization of metabolic processes in erythrocytes under the influence of Chromium (III).

During the experiment was ascertained that the glucose-6-phosphate dehydrogenase's activity decreased in erythrocytes of animals from II group comparatively to animals from I group, which indicates the inhibition of the glucose metabolism in pentose phosphate pathway during EDM. At the same time the increase of this enzyme's activity under the influence of chromium citrate in rats from III and IV groups comparatively to rats from II group leads to intensification of NADPH+H<sup>+</sup> synthesis in erythroid blood cells, which is used for biosynthesis of various organic substances and for maintenance of a normal reduced glutathione's concentration. The reduced glutathione protects hemoglobin and erythrocytes from denaturation and dissociation under the influence of various oxidizing agents.

Therefore, adding of chromium citrate to ration of animals with EDM affected the carbohydrate metabolism positively, which may become the foundation of innovative methods of diabetes treatment and prevention.