THE STUDY OF APPLE POLYPHENOL CONCENTRATE ANTIOXIDANT ACTIVITY IN RATS UNDER EXPERIMENTAL INSULIN RESISTANCE.

Skrypnyk A. V.
Scientific supervisor: ass.prof. Krasilnikova O. A.
National University of Pharmacy, Kharkiv, Ukraine
tony.scripnik@yandex.ru

Introduction. According to International Diabetes Federation, the number of patients with diabetes mellitus increased from 30 to 382 billion during last 40 years. At the same time, 90% of them have diabetes mellitus type 2 (DM2). DM2 is preceded by the insulin resistance state (IR). IR is accompanied by a violation of glucose transport and utilization in cells. In these conductions hyperglycemia, dyslipidemia and insulin secretion disorders develop. Prolonged hyperglycemia and hyperlipidemia stimulate ROS production and oxidative stress development. ROS stimulate lipid peroxidation, protein glycation and plasma membrane damage, which in turn lead to the defeat of various cells and DM2 complications development. Numerous plant polyphenolic compounds exhibit variety activities, and antioxidant properties are the most important among them.

Aim. The aim of our investigation is the study of antioxidant activity of apple polyphenols complex in rat liver and serum under experimental insulin resistance.

Materials and Methods. Experiments were performed on female rats 180±15 g kept in standard conditions of vivarium NUPh. IR was induced by high-fat and high-fructose diet during 5 weeks. Apple polyphenol complex was administered intragastric during last 2 weeks. The liver was perfused with cold physiological solution and homogenized in Tris-HCl buffer, pH 7.4. TBA-reactants and diene conjugates levels were determined in liver and serum. Data were processed statistically.

Results and discussion. The development of experimental insulin resistance was accompanied by an increase in the content of TBA-reactive products in the liver and serum of rats in 2.27 and 2.43 times, respectively. Simultaneously, the diene conjugates content in the rat serum and liver with IR was lower 1.93 and 2.22-fold, respectively. These results indicate activation of the processes of peroxide oxidation and an increase in the degree of saturation of lipids in animal tissues with experimental insulin resistance. The introduction of polyphenol concentrate from apples to animals with experimental pathology leads to a decrease the TBA-reactive products level in the liver and serum in 1.65 and 1.67 times, respectively.

Conclusions. Thus, it was found that the studied polyphenolic concentrate from apple fruits demonstrates a pronounced antioxidant effect. Thus, the studied polyphenol concentrate is a promising substance for the development of new drugs for the complex treatment of IR and associated pathologies.