

NITROGEN METABOLISM INDICES UNDER EXPERIMENTAL INSULIN RESISTANCE IN RATS

Fatchi Kautar

Scientific supervisor: ass. prof. Kravchenko G. B.
National University of Pharmacy, Kharkiv, Ukraine
annabk2014@gmail.com

Introduction. Obesity-associated insulin resistance (IR) is the main cause of diabetes mellitus type 2 (DM2). The modern life style, particularly consumption of the diet, more and more often leads to IR that mediated the dramatic changes in body metabolism. IR is frequently associated with liver and kidneys metabolic alterations that induce non-alcoholic fatty liver disease, chronic kidney disease, etc.

Aim. The aim of the experiment was to study some indices of nitrogen metabolism in blood serum and in liver and kidneys tissues under experimental IR in rats.

Materials and methods. In order to cause IR the male rats were fed high-fat diet enriched with fructose (HFDF) during 5 weeks. At the end of the experiment animals were decapitated, blood, liver and kidneys were sampled. Total protein (TP), urea (U) and uric acid (UA) were determined in blood serum, liver and kidney homogenates using the standard kits (OOO NPP “Phyllis-Diagnostic”, Ukraine).

Results and discussion. It was observed the significant decrease in blood serum TP level by 14% in IR rats. Lowering of protein in the blood can be mediated by alterations in liver metabolism as blood serum proteins have liver origin. In general liver TP content reduced by 11% and in kidneys by 14%. This evidence is correlated with increased level of catabolic products such as U and UA in blood as well as in studied organs. Thus U level in blood increased by 24%. Also, acute U increase that was found could show the contribution of muscle protein breakdown as well as could be explained by impaired protein synthesis in insulin-sensitive tissues and usage of amino acids as the substrate for gluconeogenesis.

UA is one of the end products of purine metabolism in rats. It was demonstrated an increase in UA blood concentration in 18% and at the same time substantial UA accumulation was determined in liver – by 36% and less increase in kidneys – by 15%. High blood UA concentration induced by IR can lead to cardiovascular disorders development and stimulate the aggregation of thrombocytes and as a result increased the risk of coronal thrombosis.

Conclusions. The experimental IR caused catabolic processes activation that is revealed by protein decrease in blood serum and elevated levels of catabolism products in blood serum as well as in tissues.