ROLE OF OXIDIZED MODIFIED PROTEINS IN PATHOGENESIS OF TYPE 2 DIABETES

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Type 2 diabetes mellitus (DM 2) is characterized by chronic hyperglycemia, which is accompanied by an increase in the speed of glucose auto-oxidation, followed by an increase in free radicals and oxidative stress (OS). Currently widely studied properties of the antioxidant system and lipid peroxidation (LPO), which allows to use in the treatment of patients with type 2 diabetes antioxidants. However, the problem of choosing a cell markers, which most adequately reflect the metabolic and biochemical processes in diabetes remains relevant today. Therefore, the new fundamental direction is the study of the oxidative modification of proteins (OMP) in various pathological conditions. Many researches have found a significant increase in OMP in plasma in patients with type 2 diabetes , which allows us to offer this index as a test to determine the depth of metabolic disorders in diabetes. One of the methods to evaluate the oxidative modification of protein molecules is to study the number of their carbonyl groups.

The aim of this work was to study the degree of carbonyl modification of serum proteins in experimental type 2 diabetes mellitus in rats induced by streptozotocin. Diabetes was reproduced by intravenous administration of streptozotocin in a dose of 65 mg/kg with the background of the protective action of nicotinamide. The evaluation of oxidative status of the experimental animals was performed 1 month after insulinoresistancy induction on level of MDA and on DC in serum by conventional methods, also oxidative modification of proteins were determined by Levine method in Dubinina modification.

The results showed that the level of MDA and DC in animals with pathology model was significantly higher than that of intact animals, thus confirming amplification of free radical lipid oxidation. The relationship of lipid peroxidation processes and oxidative modification of proteins in diabetic animals manifested in a significant increase in level of spontaneous oxidation of serum proteins, and less pronounced intensity induced protein degradation. The results indicate substantial activation of the total oxidative capacity in type 2 streptozotocin induced diabetes, but in the period up to 1 month of pathology adaptive capabilities of the organism in response to stimulation of protein oxidation are saved. Oxidative modification of proteins index can be used to assess the status of oxidative stress in animal models of type 2 diabetes mellitus.