THE PREPARATION OF OAK SILKWORM PUPAE (ANTHERAEA PERNYI G.-M.), WHICH PREVENTS THE DEVELOPMENT OF INSULIN RESISTANCE IN THE EXPERIMENT

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Actual problems of biology and medicine is growing in sync with the technical progress and to identify the incidence of insulin resistance in the form of metabolic syndrome, diabetes, obesity. The aim of this study was to find a biological object in nature, in the life cycle is in the process of evolution has shaped the mechanisms that prevent the development of insulin resistance. Thus the biological object was elected oak silkworm, acclimatized to the conditions of breeding in the Vitebsk region of Belarus. Pupae of this insect was obtained by triple drug extraction and boiling 0.9% sodium chloride solution and standardized content of free amino acids [1].

Modeling insulin resistance was carried out by the content of rats on high-fat diet by Lieber-De Carli for 3 months. The drug was administered intragastrically by gavage daily for the third month of the playback and insulin resistance in a dose of 7 μg of free aminoacids/100 g body weight.

Established that the high-fat diets cause the development of insulin resistance: have increased body weight of rats in the 2-fold, the concentration of glucose by 25.8%, insulin by 87%, the coefficient of Homa at 210%, the concentration of TNF-α by 7.2 times, corticosterone 1,5 times and reduced adiponectin concentration by 1.2 times. It was established that during the development of insulin resistance were activated glycogenolysis, inhibited glycolysis and oxidative branch of the pentose phosphate pathway. Pyruvate dehydrogenase activity was increased 1.8-fold, and the activity of α-ketoglutarate dehydrogenase was reduced by 1.6 times, that signaled a more intensive transformations at the level of isocitrate, the physiological role of which is the regulation of glycolysis by changing the level of citrate and participation in the NADPH-dependent processes (lipid synthesis, neutralization of xenobiotics). With the development of insulin resistance were activated gluconeogenesis and non-oxidative branch of the pentose phosphate reaction path. In the simulation of insulin resistance have been identified biochemical signs of steatogepatosis: hepatic triglyceride content was increased by 3.0 times and the cholesterol content of 3.2 times. It has been established that feeding rats high-fat food for three months resulted in increased levels of malondialdehyde 96% and caused a decrease in the level of reduced glutathione to 77.5%.

The introduction of the drug from the oak silkworm pupae on the background of feeding rats high-fat food had a positive effect: body weight decreased by 33.2%, hyperglycemia - 12%, coefficient of Homa - by 34.6%, the concentration of insulin - 26.9% corticosterone level - 35.7%. Was identified normalizing effect of the drug from oak moth pupae on the activity of glycogen phosphorylase, phosphoglucomutase, fructose-1,6-bisphosphatase, glucose-6-phosphatase, transketolase, hexokinase, phosphofructokinase and other enzymes of carbohydrate metabolism. The preparation of oak silkworm pupae warned development steatogepatosis liver, probably due to the suppression of oxidative stress in rat liver cells.

Conclusion: The result of the research obtained by the preparation of oak silkworm pupae, which is low, close to the homeopathic dilutions, hindered the development of the metabolic syndrome in the experiment [2].

References:

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