HYPOGLYCEMIC EFFECT OF APPLES POLYPHENOLS UNDER EXPERIMENTAL INSULIN RESISTANCE

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Introduction. The syndrome of insulin resistance – one of the leading reasons for the diabetes mellitus development and increased risk of cardiovascular diseases and their complications. Diabetes mellitus is characterized by a chronic course and disturbance of all types of metabolism: carbohydrate, fat, protein, mineral and water-salt. Diabetes covers 7% of the adult population in the world and about 2.9% of the population in Ukraine. The prevalence of diabetes is growing every year. Consequently, the search and development of medicines for the prevention and treatment of diabetes mellitus are relevant for today. Polyphenols are promising diabetes mellitus treatment agents because of a wide variety of pharmacological effects: anti-microbial, anti-inflammatory, diuretic, hypotensive and others. One of the best known and most accessible sources of polyphenols is Malus domestica.

Aim. The aim of this work was to investigate the hypoglycemic effect of apple polyphenols extract administration on glucose and insulin content in rats blood serum under insulin resistance.

Materials and methods. Insulin resistance was modeled by keeping animals on high- fructose diet for 6 weeks. The suspension of polyphenols were administered intragastrically the last 2 weeks of the experiment. Glucose and immunoreactive insulin content were determined by glucose oxidase and radioimmunoassay using standard kits. Insulin resistance index was calculated using the algorithm Homeostasis Model Assessment. Statistical analysis of the data was performed using STATISTICA software package (StatSoft Inc., USA, version 6.0). The significance of differences between groups was assessed by non-parametric Mann-Whitney test. Significance was assigned at $p<0.05$.

Results and discussion. The development of insulin resistance was revealed in animals with high fructose diet: accumulation of glucose (1.6 times higher compared with intact animals), insulin level enhance (1.44 times higher compared with Intact animals) and insulin resistance index enhance (3.02 versus 1.78 in the intact animals). The use of apple polyphenols normalized all indexes studied, obviously, due to a diverse composition (quercetin, procyanidins, catechins, phenolic acids) and, accordingly, to mechanisms of insulin resistance and hyperglycemia correction.

Conclusions. Investigated apple polyphenols complex is a prospective raw materials for new medications development to improve the glycemic and insulin homeostasis.