

# PROPHYLAXIS OF ENDOTHELIAL DYSFUNCTION DEVELOPMENT UNDER INSULIN RESISTANCE IN RATS

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**Introduction.** Insulin resistance (IR) is a key factor in the development of diabetes mellitus type 2 (DM2). Vessel endothelium metabolism disorders, primarily endothelial dysfunction (ED), play an important role in DM2 pathogenesis. Nitrogen oxide (NO) is synthesized from arginine and this reaction is catalyzed by NO-synthase (NOS). There is evidence that some components from bilberry (*Vaccinium myrtillu*) leaves, such as quercetin, increased the expression of endothelial NOS (eNOS), NO formation and its release from endotheliocytes. The **aim** of this investigation was to explore the effect of the polyphenol complexes from bilberry leaves with the addition of inositol and arginine on the ED development under the experimental IR. The extract was obtained by the supervision of Dr. O.H. Koshevoy.

**Materials and methods.** IR in rats was modeled by feeding the animals high-fructose diet (HFD). For the aim of experiment 18-month-old male *Wistar* rats were divided into 4 experimental groups: 1) intact animals; 2) animals, which were fed HFD during 6 weeks; 3) animals, which were fed HFD during 4 weeks and further the diet and bilberry extract enriched by inositol (no 1, 2.5 mg/100 g body mass); 4) animals, which were fed HFD during 4 weeks and further the diet and bilberry extract enriched by inositol and arginine (no 2, 2.5 mg/100 g body mass). The content of glucose, insulin, triacylglycerols (TAG), cholesterol, arginine, citrulline and nitrites and nitrates were measured in blood serum.

**Results and discussion.** Feeding the fructose diet leads to almost threefold increase in blood glucose level, development of hyperglycemia, increased cholesterol and TAG concentrations. All these changes indicate the development of IR. The significant reduction of nitrite and nitrate and citrulline content was found in the blood serum of animals under the IR, the content of arginine was increased significantly. Such disorders may be caused by oxidative damage of the enzyme or by the lowering content of coenzyme - tetrahydrobiopterin.

**Conclusions.** The administration of complex enriched both by inositol and arginine, normalized studied indices more pronounced compared to another complex. Moreover, the indices that characterized NO-system – nitrites and nitrates, and citrulline content were increased and the arginine level was reduced almost completely to that in intact animals. This is obviously due to the presence of arginine. So, the addition of arginine and inositol to the bilberry leaves extract improved its useful properties.