

The effect of the KZK compound isolated from *Trifolium pratense* L. on biochemical parameters in experimental rats with type 2 diabetes mellitus.

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Diabetes mellitus is the most widespread endocrine disorder, showing a steady increase in prevalence and acquiring the characteristics of a non-infectious epidemic. Due to the emergence of new data on the pathogenetic mechanisms underlying the development of type 2 diabetes mellitus (T2DM), incretin mimetics have been introduced, significantly expanding the possibilities for effective and safe treatment of this form of diabetes. New medicinal substances of synthetic or plant origin, as well as drugs long used in medical practice, have demonstrated the ability to prevent further progression of diabetes mellitus and the development of its complications.

The aim of our study was to investigate the effect of KZK substance on streptozotocin-induced type 2 diabetes mellitus in rats.

Materials and Methods. A high-dose streptozotocin-induced diabetes model was established by a single intraperitoneal injection of a diabetogenic dose of streptozotocin (35 mg/kg) dissolved in citrate buffer (pH 4.5). The experiments were carried out on 20 aged outbred white rats with an initial body weight of 300–350 g fed a high-fat diet. The investigated preparation, KZK, was administered orally five times after induction at a dose of 15 mg/kg. Animals in the control group (n = 10) received 0.3 mL of physiological saline solution. On the 1st and 5th days after induction, blood samples were collected dropwise from the conjunctiva of the rat eye into Eppendorf tubes. Biochemical parameters were determined by measuring glucose (mmol/L), total protein (g/dL), alanine aminotransferase and aspartate aminotransferase (ALT, AST; U/L), total cholesterol (mmol/L), and triglycerides (mmol/L) levels in blood serum using a semi-automatic biochemical analyzer “Rayto Life and Analytical Sciences Co., Ltd” with test kits produced by Cypress Diagnostics, Belgium.

Results and Discussion. It should be noted that by the 5th day, 70% of the animals in the control group had died, whereas mortality in the KZK-treated group was 40%. On the 5th day of the experiment, surviving animals treated with KZK showed serum glucose levels that did not differ from the baseline values, while in

the remaining animals these indicators were significantly lower compared to the control group.

In addition, AST and ALT levels increased 1.5-fold compared to intact animals (31.5 ± 4.2 and 39.2 ± 2.1 U/L, respectively). After 5 days, these parameters in the control group increased 13-fold ($p \leq 0.01$) relative to intact animals.

Conclusion. Fivefold therapeutic administration of the investigated KZK substance resulted in an almost complete elimination of the toxic effects of streptozotocin.