CHANGES IN THE AMOUNT OF LIPIDS UNDER THE INFLUENCE OF NATURAL BIOLOGICALLY ACTIVE FOOD SUPPLEMENTES IN EXPERIMENTAL DIABETES

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Purpose of work: *Shifo and As-GAM natural biologically active food supplement (NBAFS) of the effects of alloxan-induced diabetes in rats by changes in blood lipid spectrum.*

Keywords. *Diabetes, natural biologically active food supplement, hyperlipidemia, triacylglyceride, glucose.*

Access. Diabetes affects 9% of the adult population worldwide [1;2]. That is, one out of every 11 people has diabetes. One of the main symptoms of diabetes is hyperglycemia, the result of which is an imbalance of lipoproteins. Insulin resistance leads to increased flow of triacylglycerides to the liver. As a result, the liver accelerates the release of low-density lipoproteins into the blood. These lipoproteins turn into low-density lipoproteins in the blood. As a result, hypercholesterolemia begins. It is one of the worst consequences of diabetes [3;4].

In different countries, 56% of patients treated with herbal medicines, diabetes treatment normalized not only the glucose level, but also the lipid spectrum. 63.2% of patients noted that treatment with plants is of high quality and a safe way [5;6].

Research materials and method. The experiments were carried out on healthy, male white laboratory rats with a body weight of 180 ± 20 g, which were quarantined for 10-14 days. The animals are the following five: Group I – negative control (healthy); Group II – alloxan + metformin pharmacopoeia drug; Group III (alloxan + Shifo NBAFS); IV group (alloxan +As-GAM NBAFS); Group V consists of groups of animals in which a positive control (alloxan + dis. water) was included. The diabetes model was induced by intraperitoneal injection of alloxan at a dose of 130 mg/kg of animal body weight. Animals were fasted for 24 s to induce diabetes. During the experiment, the amount of glucose in the blood of the animals was measured. Diabetic animals were selected for the experiment and infusions of the researched drugs Shifo NBAFS - 100 mg/kg, As-GAM NBAFS - 100

mg/kg and comparative drug metformin at a dose of 50 mg/kg were administered for treatment for 14 days. Shifo and As-GAM natural biologically active food supplement were measured in doses of 100 mg/kg and injected into the stomach of rats using a special probe after boiling for 5 minutes and cooling at room temperature. The rats of the positive control group were given an equal volume of distilled water for 14 days. On the 15th day of the study, blood was taken from rats in all groups, and its content of total cholesterol (TX, mmol/l), triglycerides (TG, mmol/l), high and low density lipoproteins (HDL, LDL, mmol/l), biochemical indicators of positive control compared to group rats. Biochemical parameters were determined using CYPRESS DIAGNOSTICS (Belgium) test kits.

Research results obtained. In the alloxan model of diabetes in animals, after treatment of the experimental groups for 14 days, the amount of some biochemical indicators in their blood serum was studied and presented in the following table.

Effect of Shifo and As-GAM NBAFS on serum biochemical indicators of rats in alloxan diabetes model, (M±m; n=5)

Indicators	Groups				
	Intact control ,	alloxan + metformin	Alloxan + Shifo 100 mg/kg	Alloxan +As-GAM 100 mg/kg	Positive control (alcohol + water)
Total cholesterol	1.42±0.15	1.62±0.7	1.60±0.17	1.62±0.35	2.5±0.24
Triglyceride	1.06±0.1	1.7±0.1*** R-0.002	1.11±0.14** r-0.008	1.3±0.18*** r-0.003	2.7±0.15
HDL	1.07±0.04	1.05±0.08*** r-0.001	1.07±0.07* R-0.04	1.06±0.05*** r-0.002	0.9±0.05
LDL	1.05±0.02	1.25±0.07* R-0.01	1.22±0.07* R-0.03	1.28±0.06* R-0.01	1.53±0.04

* $r < 0.05$; ** $r<0.01$; *** $r<0.005$ - statistically significant differences compared to the control group;

Discussion. The results of the study showed that in the alloxan model of diabetes, the amount of total cholesterol in the blood serum of animals in each group was 2.5±0.24 mmol/l in the positive control, and 1.60±0.17 mmol/l in the Shifo natural biologically active food supplement, intergroup differences were clearly observed. As-GAM and Metformin drug in the blood serum of rats, the amount of total cholesterol is 1.62±0.35, respectively; It was 1.62±0.35 mmol/l and decreased compared to the positive control group, but no statistical differences were observed. The amount of triglycerides was 2.7±0.15 mmol/l in the positive control group, 1.11±0.14 in

the group of animals treated with Shifo, As-GAM and metformin, respectively; 1.3±0.18 and 1.7±0.1 mmol/l, and statistically significant differences were noted in reducing the amount of triglycerides compared to the positive control ($r<0.01$; $r<0.005$; $r<0.005$). When the amount of HDL was studied in the research, its amount decreased to 0.9±0.05 mmol/l in animals of the untreated diabetes group, in the case of Shifo As-GAM biologically active compounds and metformin drug, these indicators were 1.07±0.07, respectively; 1.06±0.05 and 1.05±0.08 mmol/l, compared to the positive control, statistically significant differences were achieved in all study groups ($r<0.01$; $r<0.005$; $r<0.005$). When the amount of LDL was studied in the experimental groups, the amount of positive control group was 1.53±0.04 mmol/l in the blood serum of rats, which was higher than the negative control group (1.05±0.02). In the case of Shifo As-GAM biologically active compounds and metformin drug, these indicators are 1.22±0.07, respectively; 1.28±0.06 and 1.25±0.07 mmol/l, compared with the positive control, statistically significant differences were achieved in all research groups ($r<0.05$; $r<0.05$; $r<0.05$).

Summary. The conclusion from the experimental results is that Shifo, As-GAM at doses of 100 mg/kg, as well as the comparative metformin pharmacopoeia drug at doses of 50 mg/kg, in diabetes model induced by alloxan, when the effects on biochemical indicators in the blood serum of rats were studied, total cholesterol was the highest in the positive control. in the remaining experimental groups, it tended to decrease, but it was statistically significant. In the group of animals treated with healing, As-GAM and metformin drugs, triglycerides, HDL, and LDL decreased with statistically significant differences from the positive control group. The conclusion is that it can be seen that these research drugs improved the biochemical changes in the blood serum of diabetic animals. In further studies, it will be possible to extend the duration of treatment and study biochemical parameters in the blood.

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