## THE EFFECTIVENESS OF USING HIRUDOTHERAPY IN DIABETES REHABILITATION IN SANATORIUM-RESORT CENTERS

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**Purpose -** analysis of scientific literature and study of the mechanism of action of hirudotherapy on blood rheology in diabetic patients

Materials and methods of the study. To achieve this goal, we analyzed the world literature from the Scopus, Web of Science, and Pubmed databases on studies on blood rheology in patients with type 2 diabetes, as well as the mechanisms of biochemical effects of hirudotherapy on the human body.

**Result.** The complex of metabolic changes revealed in diabetes mellitus (DM) usually leads to a disruption of the rheological properties of the blood. Even with a short duration of the disease, deviations in the main hemorheological parameters are observed, such as blood viscosity, the ability of erythrocytes to aggregate and deform. Rheological properties are especially important in the microvascular bed. Increased blood viscosity, hyperaggregation, and impaired erythrocyte deformability lead to decreased capillary blood flow, ischemia, and hypoxia of organs and tissues in diabetes mellitus. It has been proven that the complex of microrheological disorders occurring in diabetes mellitus is involved in the pathogenesis of its late vascular complications.

Increased blood viscosity can be considered as one of the mechanisms of pathophysiological disorders that plays a role in the development of diabetes complications. Increased viscosity contributes to tissue blood flow disruption, which limits the delivery of insulin, glucose and oxygen to tissues. This, in turn, increases insulin resistance, aggravating the course of the disease. The use of various research methods has shown that erythrocyte aggregation increases in diabetes. It is believed that erythrocyte hyperaggregation is one of the most important pathophysiological consequences in patients with diabetes with poor glycemic control. There is a lot of experimental data indicating that increased blood viscosity is a pathogenetic factor in the development of diabetic microangiopathy, polyneuropathy, microcirculation disorders and decreased tissue perfusion in diabetes. Increased blood viscosity plays a particularly important role in the development of diabetic retinopathy. High hematocrit levels have been shown to be associated with decreased retinal blood flow. Increased blood viscosity also correlates with the severity of retinopathy in diabetes mellitus. The ability of the erythrocyte to deform is a necessary condition for the performance of its main function – the delivery of oxygen to tissues. In diabetes mellitus, the shape of the erythrocyte is altered, and the severity of the disorder in the shape of the erythrocytes depends on the presence of vascular complications of diabetes mellitus. There is a decrease in the number of biconcave and an increase in transitional, prehemolytic and degenerative forms of cells. An increase in the perimeter of the cell is observed. Erythrocytes become somewhat flattened, the proportion of discocytes in the form of

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an ellipse, a flat disc, discocytes with multiple outgrowths increases. The number of cellular elements with irreversible changes in shape increases: dome-shaped, spherical. Bioactive Compounds and Biochemical Effects of Medicinal Leeches;

-*Hirudin, -Hyaluronidase* – breaks down hyaluronic acid, which is the binding material of connective tissue, thereby stimulating blood and fluid flow from the affected areas. -*Pseudohirudin, -Destabilase* – an iso-peptidase responsible for hypotensive, antithrombotic, and thrombolytic effects, -*Apyrase* – anticoagulant, -*Bdellins and Eglins* – protease inhibitors,

-Kininases, -Histamine-like substances – vasodilators, -Leech prostanoids, -Proteases, -Lipolytic enzymes, -Lipase, -Phagocytosis activator, -Serotonin, -Stable prostacyclin analog (prostaglandin).

**Conclusion.** Based on the above biochemical mechanisms of action of hirudotherapy, we can say that this method of folk medicine improves the rheology and biochemical composition of the blood. This, in turn, is effective in combating diabetes mellitus and its complications. The use of hirudotherapy in sanatoriums, along with the main treatment procedures, increases the effectiveness of treatment and prevents ischemic diseases such as heart attacks and strokes in diabetic patients.