

PROBLEMS OF SCIENCE AND PRACTICE, TASKS AND WAYS TO SOLVE THEM

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PHYSIOTHERAPY IN COMPLEX TREATMENT OF PATIENTS WITH DIABETES MELLITUS WITH VASCULAR DISORDERS OF THE LOWER LIMBS

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Diabetes mellitus is the most common endocrine pathology among people of working age. Today, the WHO has identified diabetes as an epidemic of a special non-communicable disease that is spreading rapidly in highly industrialized countries, leading to long-term disability and early death. It occupies the main place in the structure of not only endocrine diseases, but also diseases of non-endocrine origin (third place after cardiovascular and oncopathology). According to the forecasts of the International Diabetes Federation, by 2035, 592 million people will suffer from diabetes in the world. There is a view that this will lead to a health crisis in the 21st century. and could reduce life expectancy worldwide for the first time in 200 years. The earliest of all diseases, disability and high mortality among patients identified diabetes as one of the priorities of national health systems around the world, as enshrined in the St. Vincent Declaration.

Complications of diabetes mellitus are widespread in medical practice, and it is much harder to deal with them than with diabetes itself. One such complication is diabetic foot syndrome. In diabetes mellitus, organs that carry a large functional load are primarily affected. The foot performs a number of important functions: supporting, spring, accommodative, pushing. Complete or partial loss of one of these functions leads to overload of the foot, damage to soft tissues and osteoarticular apparatus. During life, 8-15% of patients with diabetes mellitus develop trophic foot ulcers, further development of the disease can be complicated by gangrene of the limb. It is known that mortality from "high" amputations is 45-50%, and every second patient after a "high" amputation dies within 5 years. Diabetic foot syndrome is one of the most severe chronic complications of diabetes mellitus. This syndrome combines pathological changes in the nervous system, arterial, venous and microcirculatory bed.

Approximately 15% of diabetic patients experience diabetic foot syndrome during their lifetime, which is the most common cause of hospitalization for diabetic patients.

Diabetic foot syndrome is defined as an infection, ulcer and/or tissue destruction of the foot associated with neurological disorders or a decrease in the main blood flow of varying severity in patients with diabetes mellitus.

Treatment of diabetic angiopathy of the lower extremities in patients with diabetes is one of the pressing problems of endocrinology and angiosurgery. Its treatment is aimed at compensating for diabetes, correction of metabolic disorders, microcirculation, rheological properties of blood, microvascular tone, transcapillary metabolism, permeability of cell membranes, stimulation of immune processes, restoration of main blood circulation.

An important place in the complex treatment of diabetes is occupied by methods of physiotherapy, the use of which helps to increase the effectiveness of treatment, maintain sustainable compensation of the disease, prevent the development and progression of complications, especially diabetic angiopathies. Of course, a significant role in the rehabilitation of patients with diabetes belongs to the sanatorium-resort stage, during which in addition to conventional methods of treatment of diabetes (diet, medication) use the influence of natural and preformed physical factors. The main objectives of physical therapy for diabetes and diabetic angioneuropathy of the lower extremities are to improve general and regional blood circulation, microcirculation, increase tissue oxygenation, improve collateral circulation and regress trophic disorders. Physiotherapy is used at different stages of diabetic angiopathy (preclinical, functional, organic).

The purpose of laser therapy is to normalize the functional state of the vascular system, improve the rheological properties of blood, restore bioelectrical activity, reduce the tone of peripheral arteries. The main importance is low-energy laser radiation, because it has a direct and indirect effect on various links in the pathogenesis of vascular lesions of the lower extremities in diabetes. The basis of yoga action is the activation of cellular enzymes, enhancing energy metabolism and synthesis processes in cells. This leads to a decrease in asthenia, pain and paresthesia in the lower extremities, increased tolerance to exercise. According to capillaroscopy, after the action of low-energy laser radiation, the number of functioning capillaries increases, pericapillary edema decreases, and the main blood circulation improves. Laser radiation has the ability to cause conformational changes in the cell membrane, reduces the aggregation properties of platelets, erythrocytes, increased fibrinolytic activity of blood, improves and accelerates blood circulation in small vessels, causes other effects that affect the pathogenetic links in diabetic. It is proved that the action of laser radiation has immunocorrective, anti-inflammatory, anti-edematous, analgesic, desensitizing effect, causes improvement of microcirculation and tissue trophism. Activation of enzymes enhances bioenergetic and biosynthetic processes in cells, increases the activity of the antioxidant system. The biostimulating effect increases the functional activity of blood cells, components of cellular and humoral immunity, increases the affinity of hemoglobin for oxygen, reduces the aggregation properties of blood and activates fibrinolysis, improves blood circulation and oxygenation of tissues, nervous excitability and excitability, nervous excitability and excitability.

Laser therapy for diabetes is carried out using different methods of exposure (monotherapy) and their combinations, which significantly increases the effectiveness of therapy. To achieve a therapeutic effect, you can implement different methods of laser therapy: non-contact, contact, contact compression. In practice, you can use the following methods of laser therapy: percutaneous, intravenous, hydrolaser shower with different ranges: red, infrared, ultraviolet. There are the following methods of using low-energy laser radiation for the treatment of vascular diseases of the lower extremities: - irradiation of biologically active areas of the extremity (laser acupuncture); - irradiation of ischemic segments of the limb with a scanning beam; - irradiation of the projection of blood vessels (arteries, veins); - Irradiation of calf muscles.

Magnetic laser therapy affects the metabolic parameters of type 2 diabetes, helping to reduce blood glucose, reduce the degree of hyperlipidemia, improve microcirculation. After magnetic laser therapy, along with clinical improvement, there is an improvement in capillary circulation, increase its reserve capacity, normalization of peripheral blood circulation. The clinical effect of magnetic laser therapy on peripheral blood circulation and microcirculation is carried out by several mechanisms, such as increasing the metabolism of smooth muscle myocytes in the vascular wall, increasing its tone in atony, restoring contractility of vascular endothelial cells in both the arterial and arterial walls. Intimate mechanisms of magnetolaser radiation are associated with the final photobiological effect (photosensitization) in the form of structural and functional rearrangement of cell membranes as a result of changes in their energy activity and conformation of liquid cell structures, redox enzymes containing copper, cytochrome some photosynthetic pigments, activation of bioenergetic processes, increase of ATP synthesis, which helps to reduce hypoxia and increase the sensitivity of cells and tissues to insulin, by increasing its metabolic activity.

To address these issues in a set of treatment programs, we conducted a combined physiotherapy with a combination of magnetic laser therapy and electrophoresis "Bischofite Poltava". Under the influence of magnetic laser therapy, vascular tone decreased and microcirculation in the distal parts of the lower extremities improved, phagocytosis and regeneration processes were stimulated, metabolic processes improved, and anti-inflammatory and immunostimulatory effects occurred. "Bischofite Poltava" contains an aqueous solution of natural chloride-magnesium, iodine-bromine mineral with a significant amount of trace elements. The total mineralization reaches 340-400 g / l. The presence of Mg ++ provides antispastic and vasodilating effect.

A total of 28 patients with diabetes mellitus with vascular disorders of the lower extremities and the presence of trophic ulcers of both the toe and foot were treated. Treatment was performed according to this method. With the help of the device "MILTA-F-8-01" magneto-laser effect (frequency 50 Hz, power of 60 mW) on the projection of inguinal vascular bundles for a period of 2 minutes on each site was performed. Then electrophoresis was performed with Bischofite Poltava (prepared for electrogel for physiotherapy) on the legs from both poles for 15 minutes. A total of 10 treatment sessions were performed. Irradiation of trophic ulcers and zones of 4 metatarsophalangeal bioactive points lasting 3-4 minutes was also performed.

According to the results of treatment, almost all patients showed improvement in well-being, reduction of pain in the lower extremities, disappearance of temporary seizures and a feeling of "chills" in the legs and feet. Healing of trophic ulcers was achieved during 2-4 sessions of physiotherapy treatment with an interval of 2 weeks. The control measurement of rheovasography noted an increase in rheographic index by an average of 11%.

Thus, the use of combined physiotherapy with a combination of magnetic laser therapy and electrophoresis "Bischofite Poltavsky" in the treatment of diabetics with vascular disorders of the lower extremities can not only eliminate the negative feelings of patients, improve the quality of impaired blood flow, but also achieve .

List of references

1. Кирилюк М.Л. Фізіотерапія при цукровому діабеті. *Здоров'я України*. 2020. №8. С. 36-37.
2. Диагностика и лечение синдрома диабетической стопы / Учебное пособие/ *Издательство УГМУ, Екатеринбург, 2016. 90с.*
3. Клинические рекомендации по диагностике и лечению синдрома диабетической стопы / *Раны и раневая инфекция*. 2015. Т.2. № 3. С. 63-83.
4. Alexiadou K., Doupis J. Management of Diabetic Foot Ulcers. *Diabet.Therapy*. 2012.3:1:4.
5. Barannik K., Barannik T., Chevtsov V. Magnetlaserbehandlung von Patienten mit Diabetes mellitus mit Gefässerkrankungen der unteren Gliedmassen. *The XIII International Science Conference «Perspectives of development of science and practice»*, December 14 – 17, 2021, Prague, Czech Republic. 626 p. S. 234-238.
6. Ed. A.Veves, J. M. Giurini, F. W. LoGerfo The Diabetic Foot Medical and Surgical Management. *Humana Press*. 2002. 536p.