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## QUALITY OF LIFE OF PATIENTS RECEIVING VARIABLE ELECTROSTATIC THERAPY WITH HIVAMAT 200 DEVICE

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*Annotation.* The effect of alternating electrostatic field as well as the influence of the prescribed in the early rehabilitation period on the patients' quality of life is studied. It is shown that rehabilitation complex leads to improvement of physical, emotional and mental components of the quality of life.

*Abstract.* The effect of an alternating electrostatic field was studied, as well as well as the effect of those prescribed in the early recovery period on the quality of life of patients. It is shown that the rehabilitation complex leads to an improvement in the physical, emotional and mental components of the quality of life.

*Keywords:* Hivamat-200, physiotherapy, quality of life, early recovery period, rehabilitation.

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Recently, effective portable devices have become available that can be used in the early stages of rehabilitation in outpatient settings [1-10].

The Hivamat 200 is widely used in physiotherapy. In this procedure, the patient's tissues are electrostatically attracted and repelled in a rhythm of a given frequency. The essence of the technique is that electrostatic impulses, which create small oscillations and deeply penetrate into the tissues, gently affect the skin, subcutaneous fatty tissue, connective tissue, lymphatic and venous vessels. Such oscillations have a directed anti-inflammatory, trophostimulating, detoxifying and draining effect, as a result of which local metabolic and trophic processes in the skin layers are improved and accelerated; pain, inflammation and oedema are significantly reduced. New physiotherapeutic technologies really need a better justification of their early application, as well as methods of evaluating the effectiveness of such rehabilitation treatment. Randomised comparative studies on the use of Hivamat 200 in the early recovery period after pelvic surgery and in diabetic neuropathy of the lower limbs.

Early diagnosis, prevention and treatment of patients in need of rehabilitation requires scientific substantiation of the possibility of using physiotherapy procedures in the early rehabilitation period. Currently, in rehabilitation medicine, when using a rehabilitation complex consisting of several procedures, special importance is attached to the methods of controlling the effectiveness of treatment [12].

The long-term results of the effectiveness of physiotherapy treatment are quality of life (QOL) indicators [11, 13].

*The aim of the work* was to study the changes in the quality of life indicators and to evaluate the effectiveness of the Hivamat 200 device in early and remote periods in outpatients.

#### *Objects and methods of research*

Eighty-five patients who underwent laparotomy operations on pelvic organs and 155 patients with diabetic neuropathy of the lower extremities were studied. The age of the patients ranged from 16 to 63 years, with an average age of  $36.3 \pm 1.6$  years. The reasons for laparotomy operations were large uterine myomas, ovarian cysts, pyosalpinx, ectopic pregnancy, pregnancy termination with uterine and fetal pathology.

In the early postoperative period in uncomplicated cases, rehabilitation complex was prescribed at discharge on the 5th-8th day in outpatient conditions. The patients were divided into 2 randomised, comparable groups by sex, age, severity of disease, similar distribution of pathology. In the comparison group A ( $n = 33$ ) physiotherapeutic procedures were not performed, and in the main group B ( $n = 52$ ) alternating electrostatic field with Hivamat 200 apparatus was applied. 155 patients with type 2 diabetes mellitus with diabetic neuropathy of the lower limbs before and after the rehabilitation course were observed. The first and the second group (main group) consisted of mature and elderly patients with type 2 diabetes mellitus with diabetic neuropathy of the lower extremities of 1-2 degree, who received drug treatment according to the protocol of the Ministry of Health of the Kyrgyz Republic and rehabilitation complex in the medical and rehabilitation centre of KNIKiVL.

The third and fourth groups (control) consisted of patients with type 2 diabetes mellitus with diabetic neuropathy of lower limbs of 1-2 degree, who received only medical treatment and gymnastics according to the protocol of the Ministry of Health of the Kyrgyz Republic.

Rehabilitation complex included regime and diet, as well as basic drug symptomatic therapy (according to the protocol of the Ministry of Health of the Kyrgyz Republic 2017). Electromassage of both lower limbs with pulsed low-frequency electrostatic field using special gloves on the lumbosacral spine, posterior surfaces of the thighs, shins and the entire foot, from the Hivamat 200 apparatus at a frequency of 160 Hz for 10 minutes, at a frequency of 60 Hz for 5 minutes every other day, the course - 10 procedures.

Subjective, objective health states and quality of life in patients with diabetic neuropathy of the lower limbs and postoperative patients with pelvic organs were evaluated. The Medical Outcomes Study - Short Form (MOS SF-36) general health questionnaire was used to assess the quality of life before and after treatment after 6 months.

Statistical processing of the results was performed using Statistic 6.0 application programmes. Differences between the compared values were considered statistically significant at the significance level of  $p < 0.05$ .

### Results of the study

The questionnaire survey of patients was conducted not only before planned surgeries, but also in patients with diabetic neuropathy of the lower extremities, before rehabilitation treatment. Therefore, in order to obtain a statistically sufficient number of KJ indicators, and taken summarily. Before surgery, the patients rated their health as catastrophic, and all measures of EF were below the critical level of 60%,  $P < 0.001$  (Figure 1).

As can be seen from the diagram, the patients in the last 4 weeks and days reported a sharp decrease in physical (FA - to 52.6 points, RF - to 49.3 points, OZ - to 44.7 points), social (SA - to 56.0 points), emotional (RE - to 43.6 points, SS - to 48.2 points) and mental (PP - to 52) components of their health. They were mostly limited in physical activity due to pain, rated at 41.1 points. Patients were passive in socialising, mentally depressed, experienced severe social anxiety, restlessness and fear.

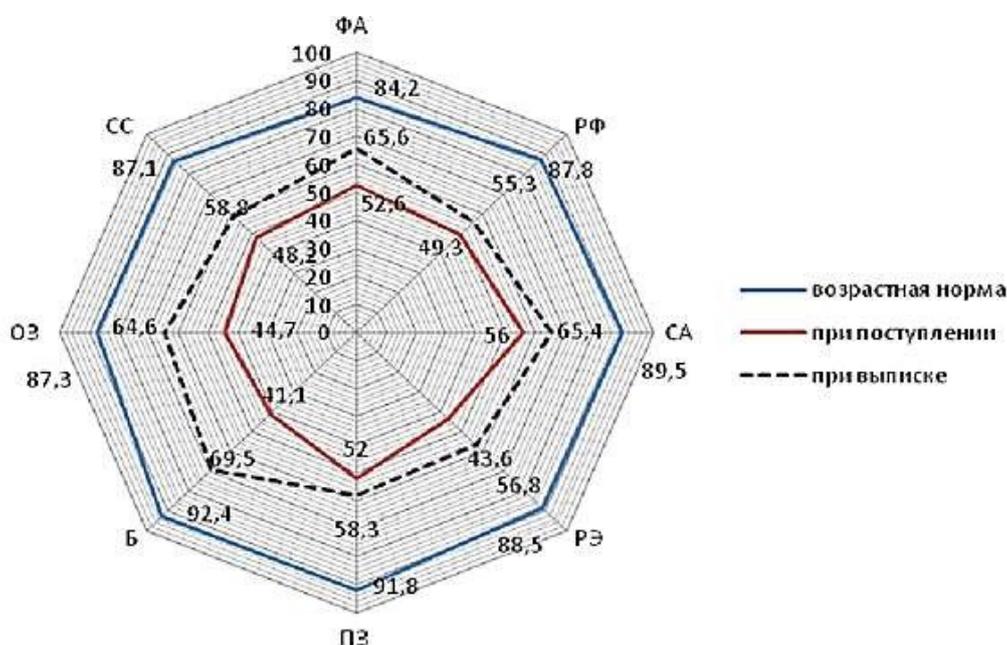


Figure 1: Quality of life indicators in control group patients at admission and discharge

At discharge, quality of life indicators significantly increased in both the main and control groups compared with the preoperative period by 15-45% ( $P < 0.05$ ). First of all, pain and limitations associated with it decreased. Physical (FA, RF), emotional (SA, RE) components of health improved. However, patients continued to evaluate general (OH) and mental (MH) health unsatisfactorily.

When comparing the QOL indicators in group B, who received physiotherapy in the early recovery period, and the comparison group (group A), all QOL indicators showed a trend towards better dynamics with the use of the developed rehabilitation complex. However, only the difference of RE and PZ indicators was statistically significant ( $P < 0.05$ ). Patients who received physiotherapy procedures felt calmer and were more sociable.

Visually, postoperative scars were mostly soft, not protruding above the surface of the abdominal wall. Abdominal pain 6 months after surgery was noted in 4% of patients in the main group and 16% of patients in the comparison group.

All quality of life indicators 6 months after the operation were significantly improved compared with those at discharge ( $P < 0.05$ ), although they did not reach the age norm. When comparing the quality of life indicators in the patients of the main group who received the developed rehabilitation complex, all components of the quality of life were higher than in the patients of the control group.

For a person suffering from diabetes mellitus affects his physical, emotional and social well-being, i.e. quality of life. In mature and elderly patients who received complex rehabilitation and drug therapy indicators of specific pain syndrome and quality of life were significantly improved after treatment and the long-term results of rehabilitation (after 6 months) were characterised by the preservation of positive results in mature patients who received rehabilitation that also in better than in the elderly. And in the similar group of quality of life indicators no changes were observed.

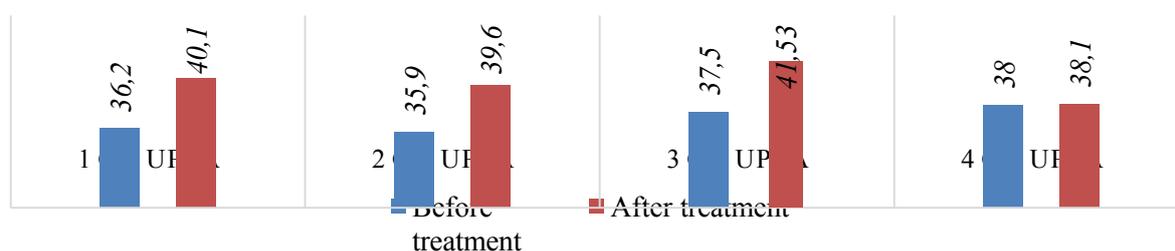


Figure 2: Experimental results

Thus, the developed rehabilitation complex applied in the early recovery period after laparotomy operations in patients leads to further improvement of physical, emotional and mental components of the quality of life.

In patients with diabetic neuropathy of the lower extremities leads to a reduction in the intensity of pain syndrome, prevents the progression of the pathological process and improves the quality of life of patients.

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