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SUMMARY

Effects of preoperative kinesitherapy on blood flow in the veins of the lower limbs and on the activity and efficiency of women after hip replacement surgery

Osteoarthritis is a pathological process, which leads to the development of degenerative changes in the joints especially hips. Pain limits joint mobility, lack of exercise causes a decrease in muscle strength and limited mobility of patients as a consequence leads to the decrease of the body's endurance parameters.

Satisfactory result of treatment of osteoarthritis is hip arthroplasty and the properly carried out improvement provides good results of surgical treatment in the form of the return of muscle strength, restoration of the extensive range of motion and resolution of pain. The long waiting time for treatment in the queuing system usually favors the exacerbation of the disease. Immobilization of patients in bed in the period before and after the operation causes the release of the blood flow which can lead to venous stasis in the lower extremities. Surgical trauma and limitation of mobility predispose to the formation of blood clots in the deep veins of the lower limbs. Venous thromboembolism - VTE is a pathology that involves the formation of the clots (emboli) in the light of the deep vein, which makes it difficult or even completely prevents normal blood flow. The knowledge of risk factors for venous thromboembolism - VTE allows the use of the appropriate thromboprophylaxis. Age, obesity, menopausal period, orthopedic surgeries, especially hip replacement procedures and the lack of exercise while waiting for the treatment favor the stasis changes in the veins. In the analysed national and international literature, there are few thesis assessing the effects of the impact of physical therapy before surgery on the blood flow in the veins of the lower limbs and the increase of the efficiency and activity of patients after hip replacement surgery. This observation and the encouraging results of the author's own research made the author evaluate the effects of the factors on the dynamics of the venous blood flow. Such data would allow for comparison and study the best way to improve the condition of patients before and after total hip, which may affect the patient's rapid return to full fitness and decisively reduce the risk of thrombotic complications.

The aim of this study was to determine whether the use of physiotherapy before the surgery of the hip arthroplasty will affect the flow of blood in the leg veins and post-operative cardiovascular fitness and physical activity of patients. Questions were asked whether the test parameters will be changed in patients in certain age groups, in the pre-and postmenopausal stages. The author tries to find out if the examined characteristics such as age, smoking, obesity have an influence on venous blood flow velocity in the lower limbs.

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Materials and methods:The study included patients aged from 32 to 91 years old, with advanced osteoarthritis of the hip who on the basis of observation, interviews and analysis of available medical records were eligible for hip replacement surgery. Patients were divided into two groups at random. The study group in the number of 98 women for the hip replacement surgery. During the period of three months prior to surgery the general therapy was introduced, and after that the patients were subjected to standard course of rehabilitation. Reference group of 96 women were patients in whom preoperative therapy have not been introduced, and after the procedure the patients had a standard course of rehabilitation. The study was conducted in two stages. In both groups of patients before the procedure the ultrasound assessment of venous blood flow velocity and tests to determine the efficiency and activity of patients before and after surgery were done.

While analysing the results it was found that in the group of patients who had general exercises before the surgery the venous blood flow velocity reached a significantly higher value. Activity and efficiency of patients also increased after the applied exercises before the surgery. Comparing the values of blood flow in different age groups of patients it was noted that a properly selected set of exercises used before the surgery had an extremely positive effect on the rate of the venous blood flow especially in patients aged over 70 years of age. In the case of women in perimenopause significant increase in venous blood flow velocity was also observed among women who entered training before surgery. Studies have shown that the velocity of venous blood flow in premenopausal women do not differ in their values of venous blood flow in women after menopause. The activity of women after menopause due to the applied practice reached higher values than in premenopausal women in the group covered by the training. In this study it was noted that excessive body weight, smoking, and age influenced venous blood flow velocity and physical activity of patients.

Conclusions: 1.The use of motor physiotherapy in women before the surgery of arthroplasty increases blood flow in the deep veins of the lower limbs. 2. Physical capacity of patients undergoing arthroplasty is greater after pre-operative training. 3. Smoking and obesity lowers the mean values of venous blood flow. 4. Postmenopausal period reduces venous blood flow velocity in women after the hip replacement surgery.