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Efficacy of electrical muscle stimulation in clinical practice

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Indirect electro-myostimulation (EMC) is an effective method of activation of the muscle pump of the leg. EMC increases the speed and volume of blood vessels in the extremities, which improves tissue oxygenation, improves venous outflow, which is a key factor in the prevention of venous stasis and deep vein thrombosis; reduces swelling, prevents atrophy of the muscles which increases the quality of life. The method is simple and available, used in hospital and outpatient practice under the supervision of nurses. In addition to the use of EMS in the treatment of patients with venous insufficiency and leg ulcers we had a number of prospective randomized studies of the effectiveness of the EMS in the treatment of patients with limited physical activity with diabetic foot syndrome (DFS), with shin bone fractures (SBF) and the long-term operational interventions (LTOI) with high risk of venous thromboembolism (VTE). EMS treatment was performed with the use of a portable autonomous device.

DFS: On average, in the EMS group (14 patients), edema subsided on the first day by 45%, on the third day it dropped down some 40% more and on the 5th day edema were cut short completely. 12 patients (86%) did not present an edema relapse. In control group (10 patients) edema subsided on the first day by 10%, on the third day it reduced some 30% more and on the 5th day it decreased 20% more and later on stayed at this level.

SBF: Edema of the affected extremity was relieved in the EMS group (30 patients) by 5th day on the average, the mean time to final osteosynthesis was 7.3+0.7 days, the mean hospital stay was 16.6+1.0 days; no case of VTE was diagnosed. In the control group (30 patients), edema of the affected extremity was relieved by 8th day on the average, the mean time to final osteosynthesis was 10.4+0.9 days, the mean hospital stay was 17.7+1.3 days; two cases of VTE were diagnosed, one of them being a fatal pulmonary embolism ($p < 0.05$). The average SF-36 score increment was 24.9% by 5th day in the EMS group and 14.5% by 5th day in the reference group.

LTOI: In the experimental group 1 case (3.3%) of deep vein thrombosis of the calf without signs of pulmonary embolism was observed, while in the control group there were 10 cases of thrombosis (33.3%) and 2 cases of pulmonary embolism (6.7%), $p = 0.008$.

Biography

V N Obolenskiy, PhD (2002) is the Head of the Septic Surgery Unit, City Clinical Hospital № 13, Moscow. He is also an Associate Professor of the Department of Surgery of the Russian National Research Medical University named after N.I. Pirogov, Moscow; correspondent member of the Russian Academy of Natural Sciences (RANS). He is a member of several professional societies, including EWMA, AO Trauma, participant EBJIS. He has published more than 40 articles in reputed journals and 8 tutorials. He has been serving as an Editorial Board Member of the journal "Wound Medicine" and "International Academic Journal of RANS".

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