

Electromyostimulation (EMS) in cardiac patients. Is EMS training becoming significant for secondary prevention?

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Aim of study

The view that moderate endurance training as a part of secondary prevention improves the prognosis for chronic heart insufficiency has been sufficiently validated. Based on experience, however, only a few well supervised, highly motivated and mostly younger patients can be reached with a complementary, sustained, sport therapy in clinical practice. Our own experience with whole body electromyostimulation of patients with cardiac insufficiency shows a thus far unanticipated potential for the regeneration of neurohumoral, inflammatory and skeletal muscular disease symptoms within the context of systemic CHI disease. Against this background, the effect and acceptance of whole body EMS in patients with cardiac insufficiency was investigated.

Methodology

15 patients with a confirmed diagnosis of CHI completed a 6-month training program (whole body EMS) with a miha bodytec device. The stimulation parameters were defined as 80 Hz and 300 μ s at 4 s pulse and 4 s pause for a period of 20 minutes, followed by a cooldown in the 100 Hz range. The patients themselves chose the amplitude (mA), and the subjective feeling of "muscle contraction/current sensation" was set at step 8 of a ten-step scale. The specifications were 40–70 repetitions in the main section, with exercises in isometric holding positions and dynamic motion drills. Cardiac efficiency was assessed in an initial test and after three and six months of training by means of spiroergometry, electrocardiography (EKG) and echo; the metabolic status including creatine kinase (CK) and lactate dehydrogenase (LDH); in addition, weight and body fat distribution were determined (impedance scale).

Results

Up to a 96% increase in the oxygen uptake at the anaerobic threshold could be demonstrated (VO₂AT 19.39 [\pm 5.3] ml/kg body weight [BW] before the start of training; VO₂AT 24.25 [\pm 6.34] ml/kg BW at the end of the training phase; $p < 0.05$). The diastolic blood pressure fell significantly ($p_{\text{syst}} < 0.05$; $p_{\text{diast}} < 0.001$), muscle growth was up as high as 14% at constant weight. The training method was 100% accepted (no dropouts). The patients indicated that their subjective capacity was significantly higher.

Conclusion

For the first time, the study showed the effect of EMS training in patients with cardiac insufficiency. The improvement in the objective assessment of their capacity as well as the optimization of muscle-physiological and metabolic parameters by far surpassed the results of traditional types of aerobic training for primary and secondary cardiac rehabilitation in patients with CHI. The form of training selected holds great potential in the treatment of patients with cardiac insufficiency.