Results: Both groups reported similar physical activity status at baseline, as assessed through the IPAQ (p=0.60), had similar body mass index (p=0.08), smoking habits (p=0.17), hypertension (p=0.15), diabetes (p=0.46) and dyslipidemia (p=0.83). General mixed effects models revealed that intervention group increased VTI by 4% (p=0.05) as compared with the control group in which no significant change was observed (p=0.47). Furthermore, the intervention group decreased Emv/Vp by 14% (p=0.06), decreased E to A ratio by 24% (p=0.04) and decreased by 8% E to Emv ratio (p=0.05), with no significant change on control group (all p>0.05). Additionally, intervention group improved 6-minutes-walk test by 13% as compared with intervention group (p=0.10), the VO2 max level by 12.5% ml/kg/min (p=0.002), the VC02 level by 21% l/min (p=0.01), and total power by 63% watts (p=0.04) as compared with the intervention group.

Conclusions: High intensity, systematic aerobic training seems to improve left ventricular diastolic function in parallel with an improvement in ergonomic capacity and tissue oxygen delivery.

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Immediate effect of neuromuscular electrical stimulation on vascular endothelial function in patients with acute myocardial infarction
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Background: Neuromuscular electrical stimulation (NMES) is effective in preventing skeletal muscle mass loss and muscle weakness. Although a long-term NMES for thigh muscles has been shown to improve vascular endothelial function, the immediate effect of NMES on it is still unknown in patients with acute myocardial infarction (AMI). We investigated the immediate effect of NMES on vascular endothelial function in AMI patients.

Methods: 35 male patients (63±11 years) were recruited for this study, who were admitted to Kitasato University hospital because of AMI and had clinically stable condition. The patients were divided into NMES and control groups. The NMES was performed for the quadriceps and gastrocnemius muscles with the cycle of 5-sec stimulation and 5-sec rest for 30 min, in which the 2.5 kHz alternating sinusoidal current was used at bursts of 50 Hz carrier frequency and 0.4 msec duration. The current was set at the highest tolerable intensity up to 100 mA in the NMES group and at the minimum intensity that did not lead to visible and palpable muscle contractions in the control group. Reactive hyperemia index (RHI), a non-invasive measure of vascular endothelial function, was measured before and after the NMES session, which was assessed as the ratio of the fingertip pulse wave amplitude measured after upper arm compression to that before compression using a finger plethysmograph. Transcutaneous oxygen tension (TOPO2) of foot was measured during the session using a transcutaneous O2/CO2 gas device as a parameter of peripheral circulation. Low-frequency component (LF) in blood pressure variability and high-frequency component (HF) in heart rate variability were also analyzed during the session, indicating sympathetic and parasympathetic activities, respectively. The Wilcoxon signed rank test and repeated measures analysis of variance (ANOVA) were used to assess the statistical differences in vascular endothelial function, and cardiovascular and autonomic responses before and after the session in the two groups.

Results: The RHI increased significantly from 1.50±0.4 before the session to 1.75±0.6 after the session (P=0.05) and TOPO2 increased from 48.5±12 to 60.6±11 mmHg (P<0.05) in the NMES group. They showed no significant changes before and after the session in the control group. No significant changes were observed in blood pressure, heart rate, LF and HF throughout the session in the two groups.

Conclusion: A single session of NMES improves vascular endothelial function without an excessive elevation of sympathetic activity nor cardiovascular instability in AMI patients.

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Prognostic value of the six-minute walk test in patients after myocardial infarction
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Post-infarct impairment of exercise capacity is a negative prognosticator for increased incidence of adverse events. The six-minute walk test (6MWT) is regarded as a safe method of the assessment of functional capacity corresponding in terms of workload to submaximal treadmill exercise. We investigated the predictive value of 6MWT performed early after myocardial infarction (MI) in relation to the diastolic waves: Emv exercise capacity at 6 month follow-up. We included 106 pts (58±8 yrs) with acute MI treated with primary PCI. All subjects underwent echo study and 6MWT on the 7th day and 6 months after MI. Echocardiograms were reviewed at discharge and approved the protocol.

Results: Fore and after the session in the each group. The Wilcoxon signed rank test and repeated measures analysis during the session, indicating sympathetic and parasympathetic activities in AMI patients.

Conclusion: High intensity, systematic aerobic training seems to improve left ventricular diastolic function in parallel with an improvement in ergonomic capacity and tissue oxygen delivery.