Effect of very short-term inpatient cardiac rehabilitation programs in acute myocardial infarction patients treated with primary percutaneous coronary intervention

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Background: Exercise-based rehabilitation is an important part of treatment patients following acute myocardial infarction (MI). However, data are scarce on the efffects of very short-term exercise programs in patients with acute MI treated with primary percutaneous coronary intervention (pPCI). The aim of the study was to evaluate the effects of very short-term exercise training on cardiopulmonary exercise testing (CPET) parameters in patients suffering acute MI treated with pPCI.

Methods: We studied 40 consecutive patients with MI treated with pPCI reffered for rehabilitation to our institution. The study population consisted of 39 men and 1 women (age 50,60±8,40 years, left ventricular ejection fraction 53,05±6,74 %), who participated in 3-week clinical cardiac rehabilitation program. The program consisted of cycling for 7 times/week, and daily walking for 45 min at intensity of 70-80% of the individual maximal heart rate. All patients performed symptom-limited CPET on a bicycle ergometer with a ramp protocol of 10w/min. The CPET also performed after cardiac rehabilitation programs.

Results: After 3 weeks of exercise-based cardiac rehabilitation program improved exercise tolerance as compared to baseline (peak workload 111,50±15,07 vs 129,00±12,77 watts, respectively, p<0,001), as well as peak respiratory exchage ratio (1,02±0,10 vs 1,08 ± 0,13, respectively, p<0,05). Peak systolic blood pressure, heart rate, peak and after 1 minute of rest were also improved. Most importantly, peak VO2 (18,17±3,30 vs 20,64±3,27 ml/kg/min, respectively, p<0,001), peak VCO2 (1,65±0,28 vs 1,96±0,25 ml/kg/min, respectively, p<0,001), peak ventilation (48,61±10,70 vs 57,27±9,85 L/min, respectively, p<0,001) and peak oxygen pulse (14,16±2,62 vs 60.18±14.19 ml/ beat, respectively, p<0,05) were also improved. No major adverse cardiac events were noted during the rehabilitation program.

Conclusion: Very short-term exercise training in patients with acute MI treated with pPCI is safe and improves functional capacity, as well as test duration, work load and heart rate response.

Key words: cardiac pulmonary exercise testing, exercise training, cardiac rehabilitation, myocardial infarction