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**Comparative analysis of exercise programmes with aerobic moderate and high-intensity interval training in patients after coronary artery bypass grafting**

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Background. High-intensity interval training is emerging as a potential time efficient strategy in contemporary cardiac rehabilitation. According to current guidelines 150 minutes of moderate physical activity per week is reduced by half to 75 minutes if the week’s activity is done at a vigorous intensity. Objective: The main goal of our study was to assess and compare high-intensity interval training (HIIT) with moderate-intensity continuous training (MICT) within cardiac rehabilitation after coronary artery bypass grafting. Methods: Sixty three patients (48 male, 15 female, at the mean age of 57±12 years) after coronary artery bypass grafting were recruited into exercise training program on cycle ergometer. The training course started 2 weeks after surgery, lasted 4 weeks and then continued in an outpatient care after 3-6 months. MICT was considered as 50% to 75% of VO2 max (maximal oxygen consumption) or 50-75% of heart rate reserve, while HIIT was considered as = 85% of VO2 max or = 85% of heart rate reserve. Training protocols included constant load and ramp interval programs. Control group comprised 40 patients without exercise training program. The safety of HIIT/MICT was the primary end point in our study. Secondary end-points included body mass index, echo and hemodynamic parameters, NT-proBNP and HbA1c levels along with standard cardiorespiratory fitness indicators. Results: Significant increase in anaerobic threshold (by 16.9%), VO2 max (by 18.6%) and tolerance of physical load in MET (by 6.4%) were mentioned in study groups compared to equivalent measurements in control group (9.7%, 7.9% and 5.4% correspondingly). Substantial changes were also observed in following variables compared to control group: body mass index reduced (p=0.0032), end diastolic diameter decreased (p=0.0315), LV ejection fraction improved (p=0.045), NT-proBNP reduced (p=0.0015) and HbA1c improved (p=0.023). While analyzing aerobic capacity alterations due to HIIT versus MICT by standardized mean difference (95% CI), HIIT was significantly superior to MICT. Aerobic capacity covered VO2 max (ml/kg/min), anaerobic threshold (%), work rate (Wt) and EQo2=VE/Vo2. Conclusions: High-intensity interval training proved to be as safe as a moderate-intensity training in patients after coronary artery bypass grafting. It appeared to be significantly superior to moderate-intensity continuous training in improving cardiorespiratory fitness. Obtained results allow implementing aerobic interval training individually after open-heart surgery and shorten rehabilitation period.