A flying start? – Early interval training in heart failure rehabilitation

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Low uptake to cardiac rehabilitation and poor adherence after hospital-based programs are major challenges in helping heart failure patients benefit from exercise training. Even though randomized controlled clinical trials demonstrate better quality of life and fewer hospitalizations, evidence-based strategies to overcome barriers to regular exercise are lacking\(^1\). According to consensus documents mobilization should start as early as possible after the clinical condition has stabilized\(^2\). In contrast, most studies wait several weeks before training programs start. Notably, a small observational study from the United States reported that only 17% (14/83) of heart failure patients eligible for cardiac rehabilitation enrolled as inpatients, whereas 97% (35/36) of those referred from cardiology or heart failure outpatient clinics accepted\(^3\).

Two recent studies have taken potentially important steps forwards, documenting promising effects of exercise programs early after recovery from heart failure. Last year Acanfora and colleagues published results from a 4-week program starting within the first two weeks of hospital admission for acute cardiogenic pulmonary edema in middle-age and elderly patients\(^4\). Patients trained under supervision 6 days per week and the control group got written instructions to exercise at home. The training sessions comprised intensity-controlled continuous exercise on bicycle ergometer or treadmill for 20 minutes during the first 2 weeks, increasing to 30 and 40 minutes in week 3-4, respectively, plus 5-10 minutes warm-up and cool down. Training intensity was adjusted from 60% of peak oxygen uptake (VO\(_{2\text{peak}}\)) during week 1-2 to 70%/85% in week 3/4, respectively, using the heart rate response from the cardiopulmonary exercise test at baseline. VO\(_{2\text{peak}}\) increased significantly in both groups during the 4-week training period, from 12.5 ml.kg\(^{-1}\).min\(^{-1}\) to 15.8 in elderly patients and from 14.0 to 18.7 in middle-age, whereas there was no change in the control groups. These changes were accompanied by substantially improved quality of life in the training groups only, measured by the Minnesota living with heart failure questionnaire (MLHFAQ).

Similar results from a randomized controlled clinical trial in Moscow are published elsewhere in the current issue of the European Journal of Preventive Cardiology (p. xx-yy). Doletsky and colleagues found an increase in VO\(_{2\text{peak}}\) from 13.6 ml.kg\(^{-1}\).min\(^{-1}\) to 15.9 after a 3-week exercise training program in mostly male heart failure patients (mean age 61, NYHA class II-III), and a further increase to 17.4 at 3-months follow-up, whereas there was no change in the control group. The improvements were paralleled by better MLHFAQ quality of life, reduced left ventricular volumes, and higher ejection fraction. Participants started exercising 5 days per week on a bicycle ergometer within the first 2 weeks after hospitalization for heart failure. Sessions comprised 3 minutes warm-up and a period of interval training alternating between 20 seconds at approximately 70% of maximal heart rate (50% of maximal load) and 40 seconds pedaling at 10 W, followed by 2 minutes recovery. Duration of the interval training varied according to baseline fitness; 10 minutes for
patients with VO_{peak} <10 \text{ ml.kg}^{-1}\text{.min}^{-1}, and 15/20 minutes for patients with at 10-14/ >14 \text{ ml.kg}^{-1}\text{.min}^{-1}, respectively. In addition, exercise time was increased by up to 5-10 minutes on the basis of individual tolerance. Patients in the control group received physical activity recommendations at discharge from hospital.

These studies suggest that an early start of exercise training is feasible and may give a flying start to patients’ rehabilitation after worsening of heart failure. The large improvement in quality of life is encouraging and would probably boost the motivation for sustaining regular exercise and other life-style changes beyond the short-term supervised training period. A caveat is that the marked contrast to the control group could partly result from general factors, such as the extra attention, time and encouragement from professional helpers most days of the week.

Whether the large increments in cardiorespiratory fitness (VO_{peak}) translate into fewer hospital admissions for decompensation and lower mortality remains to be seen. Even though the frequency of serious adverse events per week were similar as in the SMARTEX-HF study\textsuperscript{5}, the number of patients and the observation time were too small for statistical evaluation. To date, the only clinical trial with sufficient power to detect reduced number of clinical events was the HF-ACTION study with 2331 patients\textsuperscript{6}.

As emphasized by the authors, the study participants were a selection of the healthiest patients without serious comorbidities and other handicaps, and – just like in most randomized clinical trials – those most willing and able to participate. Further studies are needed to determine whether an early start may be a useful tool to increase the uptake to exercise training programs, and whether it can improve adherence in everyday life when the structured program is over. A major challenge in cardiac rehabilitation is helping those who need it most to implement and maintain lifestyle changes over time. As detailed in The ESC Handbook of preventive Cardiology\textsuperscript{7}, working on the motivation to overcome potential barriers may enforce our efforts to reach these goals.

References


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