

Cardiac rehabilitation improved exercise tolerance after a myocardial infarction in older patients

Marchionni N, Fattiroli F, Fumagalli S, *et al.* Improved exercise tolerance and quality of life with cardiac rehabilitation of older patients after myocardial infarction: results of a randomized, controlled trial. *Circulation* 2003;107:2201–6.

Q In patients >45 years of age who have had a myocardial infarction (MI), does cardiac rehabilitation (CR) improve short and long term exercise tolerance?

METHODS



Design: randomised controlled trial.



Allocation: unclear.



Blinding: blinded (healthcare providers, data collectors, and outcomes assessors).



Follow up period: 14 months.



Setting: a university CR unit in Florence, Italy.



Patients: 270 patients >45 years of age (age range 46–86 y, 68% men) who were referred to the CR unit for functional evaluation 4–6 weeks after MI. Exclusion criteria included severe cognitive impairment or physical disability, left ventricular ejection fraction <35%, contraindications to vigorous physical exercise, and living too far from the CR unit.



Interventions: Patients were allocated in an age (3 age groups predefined as middle aged 45–65 y, old 66–75 y, and very old >75 y) and sex stratified factorial design to a 2 month programme of hospital CR (n = 90), home CR (n = 90), or no CR (n = 90). The hospital CR programme consisted of 40 exercise sessions including 24 sessions (3/wk) of endurance training on a cycle ergometer plus 16 (2/wk) 1 hour sessions of stretching and flexibility exercises. In both sessions exercise intensity was set at 70–85% of heart rate attained during a baseline symptom limited exercise test. The home CR programme consisted of 4–8 supervised instruction sessions in the CR unit where patients were taught necessary precautions and how to perform their training at home. Patients received an exercise prescription similar to that of the hospital CR group. A physical therapist made home visits every other week to adjust the exercise prescription as necessary. Patients in both the hospital and home CR groups received cardiovascular risk factor management counselling. Patients in the no CR group attended a single structured education session on cardiovascular risk factor management with no exercise prescription.



Outcomes: exercise tolerance measured by total work capacity (TWC) (symptom limited exercise test on a cycle ergometer) assessed at baseline, the end of the 2 month intervention period, and 6 and 12 months after completion of the intervention.



Patient follow up: 86%.

MAIN RESULTS

Improvement from baseline in TWC was greater in each of the hospital and home CR groups than in the control group for middle aged ($p = 0.002$) and old patients ($p < 0.001$). However, within groups, TWC remained higher than at baseline across all measurement points in the home CR group only.

CONCLUSIONS

Both hospital and home cardiac rehabilitation (CR) improved short term exercise tolerance in patients after myocardial infarction. Home CR improved long term exercise tolerance in all patients, whereas hospital CR improved tolerance only in patients 45–65 years of age.

Commentary

Evidence that CR is effective comes from studies done mostly in middle aged men.¹ Although the trial by Marchionni *et al* also included a high proportion of men, its focus was on exploring the differences and similarities among equal cohorts of middle aged, old, and very old patients. As such, it makes a valuable contribution to our understanding of the potential benefits of CR, especially regarding the participation and outcomes of very old patients, who have been underrepresented in previous studies. The authors report on enrolment (more old patients were ineligible for the study), dropouts (more very old patients dropped out), and completion of training (no differences among age groups), as well as the usefulness of CR in enhancing exercise tolerance and increasing health related quality of life (HRQL). Very old patients responded to CR, both hospital and home based, with increased HRQL, indicating that CR may provide benefits at all life stages. Similarly, the exercise tolerance of very old patients improved, especially with home CR, although there was lower enhancement at the end of 2 months in this group than in the other 2 age cohorts.

Still unknown is the optimum length of time required to produce increased exercise tolerance or how safe and efficacious CR would be for less healthy elderly patients. A study to explore the type and length of CR that would be most useful in this age group seems warranted. In the meantime, patients ≥ 75 years of age who are in sufficient good health should be encouraged to take part in CR, particularly if it can be facilitated in the home environment.

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¹ Jolliffe JA, Rees K, Taylor RS, *et al.* Exercise-based rehabilitation for coronary heart disease. *Cochrane Database Syst Rev* 2003;(3):CD001800.

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