Cardiac rehabilitation improves quality of life and walking tolerance in elderly patients with heart failure

Synopsis


Question For patients over 60 years of age with heart failure, does cardiac rehabilitation improve outcomes over standard care at a heart failure clinic? Design Randomised controlled trial with concealed allocation and blinded assessors. Setting Participants were recruited from the acute medical unit and outpatient clinics of a UK hospital and surrounding general practices. Patients Patients over 60 years of age with New York Heart Association (NYHA) class II or III heart failure and left ventricular systolic dysfunction (ejection fraction ≤ 40%). Exclusion criteria included diastolic dysfunction and significant co-morbidities. Thirty-five eligible patients refused to participate. The remaining 200 were randomised to cardiac rehabilitation (n = 100) or standard care (n = 100). Interventions Patients in both groups received outpatient monitoring of their clinical status every eight weeks for 24 weeks, an explanation of heart failure, advice regarding diet and self-monitoring for fluid overload, and a record of their medications, test results, and appointments. During the first eight weeks, the cardiac rehabilitation group also attended twice weekly classes for aerobic and low resistance strength training, and educational input on medication, diet and exercise. For the latter 16 weeks, this group attended community-based exercise classes weekly. This group also received transport to the classes if necessary, encouragement to exercise an additional three times per week at home, and written materials. Outcomes NYHA classification and the Minnesota living with heart failure (MLHF) questionnaire were assessed at baseline, eight and 24 weeks. The six minute walk test (6MWT) and the EuroQol questionnaire were assessed at baseline and 24 weeks. Hospital admissions due to heart disease were also recorded. Results Change in NYHA classification was significantly better in the cardiac rehabilitation group than the control group at eight weeks (Mann-Whitney test, p = 0.001) and at 24 weeks (p < 0.001). The cardiac rehabilitation group was significantly better than the control group on the MLHF score at 8 weeks (13 points, 95% CI 7 to 19) and at 24 weeks (14 points, 95% CI 8 to 20). The cardiac rehabilitation group was also significantly better than the control group on the 6MWT (68 m, 95% CI 33 to 102) and the EuroQol score (12 points, 95% CI 7 to 17). Hospital admissions (p < 0.01) and days in hospital (p < 0.001) were also significantly fewer in the cardiac rehabilitation group. Conclusion For patients over 60 years with heart failure cardiac rehabilitation provides important benefits over outpatient clinic care.

Commentary

The provision of exercise and rehabilitative therapy is recommended in international guidelines for the management of coronary heart disease. Whilst there is good physiological evidence supporting exercise as an effective intervention for patients with chronic heart failure, there is little in the literature describing large-scale delivery of a rehabilitation program. Also, a systematic review of exercise training for heart failure found a lack of studies in the elderly (Rees et al 2004). This paper describes the results of a low-tech exercise program in a large group of elderly patients (over 60 years) with heart failure (n = 200). The results are impressive, reporting significant improvements in the six minute walking test (6MWT) distance and quality of life. The authors underplay the dramatic reduction in the total number of admissions and the hospital days after rehabilitation.

From a clinical perspective several interesting points emerge. The authors screened 493 potential patients but excluded 293. The majority were excluded because of co-morbidities (52%), and a smaller number refused to participate. There were changes to the medication in both groups during the course of the program. These were evenly distributed except for the prescription of β-blockers, which was enhanced in the experimental group. This discrepancy is potentially a confounding variable making it difficult for the reader to ascertain the relative contribution to the change in 6MWT distance i.e., the exercise training regime or the change in medication. Furthermore we are unable to identify where the changes in exercise tolerance occurred – during the initial hospital phase or later in the community? Whilst not directly comparable, the minimum clinically important difference for the 6MWT for a COPD population has been described (54 m) (Redelmeier et al 1997). The difference between the groups, whilst not identified, would be in the region of 45 m. The proportion of patients exceeding this limit would define the responders from non-responders. Despite these issues this paper makes a welcome and valuable contribution to the care of patients with heart failure.

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References

Treadmill training more effective than Bobath training in improving walking following stroke

Synopsis


Question After recent stroke, does six weeks of aerobic treadmill training increase maximum walking speed and capacity more than Bobath walking training?

Design Randomised, controlled trial with concealed allocation.

Setting Rehabilitation unit. Patients Fifty patients were recruited within six weeks of their first supratentorial stroke. Eligibility criteria included ability to walk 12 m with intermittent help or stand-by, 50 to 75 years of age, a Barthel Index of 50 to 80, and participation in a 12-week rehabilitation program. Twenty-five patients were randomised to the treatment group and 25 to the control group.

Interventions Each patient received 60 min of individual physiotherapy time per week day for six weeks. For patients in the treatment group, therapy consisted of 30 min of treadmill training and 30 min of Bobath walking training. During treadmill training, patients wore a harness to prevent falls and exercised at 60% of their heart rate reserve. Patients in the control group received 60 min of Bobath walking training. Other aspects of the rehabilitation programme were maintained in both groups according to individual needs.

Outcomes The primary outcomes were walking speed and capacity, measured at the end of the six week program and 12 weeks later. Speed was taken as the average of two trials of walking 10 m at maximum speed. Capacity was assessed using the six minute walk test. Secondary outcomes included gross motor functions and walking quality.

Results From baseline to six weeks, speed increased 0.15 m/sec (95% CI 0.12 to 0.18) and capacity increased 34.9 m (95% CI 14.8 to 55) more in the treatment group than in the control group. From baseline to 12 weeks post-program, speed increased 0.22 m/sec (95% CI 0.12 to 0.32) and capacity increased 54.3 m (95% CI 29.8 to 78.2) more in the treatment group than in the control group. Secondary outcomes did not differ significantly at any time between groups.

Conclusion Treadmill training induces greater improvements in walking speed and distance than Bobath walking training in patients with moderate physical disability due to recent first stroke.

Commentary

This trial makes a substantial contribution to the evaluation of treadmill training with body weight support for walking after stroke. Having recruited 50 people with stroke, it is adequately powered to detect clinically worthwhile effects. The trial also incorporates design features to minimise bias in the results, achieving a PEDro score of 8/10. This is actually the highest possible score for this type of trial, as it is not possible to blind the subjects or therapists (Maher et al 2003). The treatment effects were both statistically significant and clinically worthwhile. The trial has been included in the update of the Cochrane systematic review on this topic (Moseley et al 2005). While there were no statistical differences detected in the meta-analysis, significant effects in two (Eich et al 2004, Pohl et al 2002) of the five trials recruiting independent walkers are likely to be due to the intensity of the treadmill training protocols.

Some key features of the treadmill intervention included: cardiovascular screening, using a modified parachute harness secured to an overhead support system to prevent falls, adjusting both the speed and inclination of the treadmill to achieve a training heart rate, monitoring heart rate during training, and repeated exposure to this training. While treadmill and body weight support equipment are now commonly available in rehabilitation units in Australia, most training occurs with the treadmill horizontal. Increasing the treadmill slope and using portable heart rate monitors during therapy may optimise the treadmill training currently provided. The 6-minute walk test or fast-paced 10-metre walk test could be used to monitor clinical outcomes.

Interestingly, the size of the treatment effect increased during the follow-up period. One possible explanation is that the gains in walking speed and capacity during the intervention phase allowed the subjects to participate more in instrumental activities of daily living, work, and leisure, and that this increased participation provided sufficient stimulus to further improve fitness. Unfortunately, because participation was not quantified, one can only hypothesise about this relationship.

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References

Aerobic walking and strengthening exercises have similar effectiveness for knee osteoarthritis

Synopsis


**Question** To compare the efficacy of aerobic walking and home based quadriceps strengthening exercises in reducing pain and disability in knee osteoarthritis. **Design** Systematic review of randomised controlled trials. **Setting/population** People with knee osteoarthritis. **Interventions** Comparison of aerobic walking or home based quadriceps strengthening exercise with a non-exercise control group. Strengthening exercise was considered to be ‘home based’ where it was undertaken exclusively in the subject’s home environment or, where exercise was partly supervised, the regimen was intended to be continued at home unsupervised. **Outcomes** Pain and disability. **Results** 13 studies were included. One study provided a direct comparison between aerobic walking and home based strengthening exercises and control. Nine RCTs evaluated quadriceps strengthening exercises, and in three studies the exercise intervention was predominantly aerobic walking. Control interventions included education and lifestyle advice, support by telephone calls, and no intervention. When comparing aerobic walking with no exercise interventions, the pooled effect sizes for pain and disability were 0.52 (95% CI 0.34 to 0.70) and 0.46 (95% CI 0.25 to 0.67) respectively. Corresponding effect size for quadriceps strengthening was 0.32 (95% CI 0.23 to 0.42) for both pain and disability. **Conclusion** Both aerobic walking and home based quadriceps strengthening exercises are effective at reducing pain and disability in subjects with knee osteoarthritis. No advantage of one form of exercise over the other was found on indirect comparison.

Commentary

We have read with great interest the review by Roddy et al (2005). Their review poses questions of interest for all physiotherapists. It compares the efficacy of aerobic walking and home based quadriceps-strengthening exercises in patients with knee osteoarthritis, and supports the evidence for small to moderate improvement in pain and self-reported disability for both aerobic and strengthening exercises compared to no exercise interventions.

Systematic reviews give us the answers in general terms. This is also the case in the present review. The 13 included studies vary in terms of both patient populations and types of interventions. For example the inclusion criterion ‘knee osteoarthritis’ is not defined explicitly, and varies from OA according to the ACR/EULAR criteria to self reported knee pain. Further, OA is a diagnosis with age-related symptoms, and age is therefore an important variable. In the included studies age varied from 40 to 80 years. The interventions are heterogeneous, extending from supervised exercise in a hospital, to the use of pedometer and taping of the patella, or walking exercises at home. The duration of the interventions varied from eight weeks to two years. In some of the control groups other interventions, such as self-management programs, telephone calls or treatment as usual, were applied. The term ‘aerobic walking’ is not further explained. Does it include ‘exercise walking’ or just ‘walking’? If not, it would be interesting to see a discussion on how the different terms would affect the outcome.

The review supports and encourages physical therapists to continue the use of exercise interventions when treating patients with knee OA. However the review won’t help therapists who wish to know what type of exercise is most effective in treating a specific patient in clinical practice. The heterogeneity in diagnosis, participant age, and exercise treatment evident in the review prevents this. Further research is required to identify the most effective exercise intervention for clearly defined subpopulations of patients with OA.

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