Exercise Training Improves Overall Physical Fitness and Quality of Life in Older Women With Coronary Artery Disease

Just Keep on Moving?

Historically, the beneficial effects of exercise on the coronary heart disease risk profile are less marked in women compared with men. In previous observational studies, a lower fitness level was associated with a fourfold to sevenfold increased risk for all-cause mortality in women, and higher activity levels have been associated with decreased relative risks for coronary artery disease (CAD) and stroke, compared with a lower activity level independent of other risk factors.

Physical inactivity presents in >65% of the elderly. In the 10-year follow-up of the Multiple Risk Factors Intervention Trial, subjects in both treatment groups who engaged in moderate physical activity had a 27% lower CAD mortality rate than less active subjects. Mechanisms by which increased exercise benefits patients with CAD may include improvement in the following: endothelial function, vasodilatory reserve, vascular conditioning, capillary density, oxidative enzyme content, mitochondrial number and size, high-density lipoprotein, collateral circulation (possible), insulin resistance, BP, body weight, psychological benefits, and increased self-confidence. In one angiographic study, there were favorable changes in the morphology of obstructive lesions.

The conditioning effect of exercise on skeletal muscles allows a greater workload at any level of total body oxygen consumption. By decreasing the heart rate at any level of exertion, a higher cardiac output can be achieved at any level of myocardial oxygen consumption. The combination of these two effects of exercise conditioning permits the patient with chronic stable angina to increase physical performance substantially following institution of a continuing exercise program.

One randomized trial of cardiac rehabilitation with exercise training demonstrated a statistically significant cardiovascular mortality benefit. Two meta-analyses showed that overall mortality and cardiovascular mortality, defined as fatal reinfarction and sudden death, were reduced by 20 to 25% in patients randomized to exercise training. We know that the most accurate measure of exercise capacity is the maximal oxygen uptake, and recently demonstrated that improvement in peak aerobic power (VO_2peak) was associated with prognostic implications and reduction in cardiac mortality in older women with CAD.

The article by Hung and colleagues in this issue of CHEST (see page 1026) provides some important insights on two methods of exercise intervention in a group of older women with CAD that can improve VO_2peak, muscle strength, and quality of life (QOL). They compared the effect that aerobic training (AT) and combined aerobic and upper- and lower-extremity strength training (COMT) had on several variables in 18 older women (60 to 80 years old) with documented CAD (after exclusion of high-risk patients). Exercise duration was 30 min per session, 3 d/wk, for 8 weeks. Irrespective of the type of training, there was statistically significant posttraining improvement in VO_2peak, distance walked in 6 min, lower-extremity strength, and emotional, physical, social, and global QOL. COMT resulted in a significant improvement in upper-extremity strength (no change after AT), and a greater absolute improvement in emotional, physical, social, and global QOL. Despite the small number of subjects in the study group, no mention of left ventricular systolic and diastolic function, and the presence and quantity of myocardial ischemia, Hung and colleagues must be congratulated for this prospective investigation, which provides important information for us to use in cardiac rehabilitation programs, and to be applied in future large-scale trials with longer follow-up to determine long-term morbidity and mortality benefits.

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REFERENCES


Benefits of Cardiac Rehabilitation in the Elderly

Despite the increasing prevalence of coronary artery disease (CAD) among older patients, there seems to be a strong age bias in the treatment of cardiovascular diseases, including various preventive strategies.\(^1\)\(^–\)\(^6\) Data from Ades and colleagues\(^7\)\(^–\)\(^9\) as well as from our institution indicate that elderly patients are less likely to be referred to formal cardiac rehabilitation programs, and when referred, experience poor program compliance due to the lack of “strength” of the referring physicians’ recommendation.\(^1\)\(^,\)\(^10\) At our institution, elderly patients are routinely referred for cardiac rehabilitation, yet attend our program only half as frequently as do younger patients.\(^1\) However, we and others have reported the significant benefits of formal, phase II cardiac rehabilitation and exercise-training program on plasma lipids, obesity indexes, exercise capacity, behavioral characteristics, and quality of life (QOL), including subgroups of elderly patients ≥ 75 years of age as well as older women.\(^10\)\(^–\)\(^17\)

We recently reported\(^11\) on the benefits of formal cardiac rehabilitation in 268 consecutive elderly patients ≥ 65 years of age (mean age, 70 ± 4 years; 76% men). In this cohort, following rehabilitation, small, but statistically significant, improvements were noted in obesity indexes, including total weight (−1%; \(p < 0.05\)), body mass index (−1%; \(p < 0.05\)), and the percentage of body fat (−6%; \(p < 0.001\)). Although total cholesterol and triglyceride levels had nonsignificant minor improvements following rehabilitation, there were significant improvements in high-density lipoprotein (HDL) cholesterol (+3%; \(p < 0.01\)), total cholesterol/HDL ratio (−4%; \(p < 0.01\)), and fasting glucose level (−4%; \(p < 0.01\)). Estimated exercise capacity improved markedly (+34%) following cardiac rehabilitation. There were also demonstrable improvements in validated scores for anxiety, depression, and somatization by 40%, 40%, and 33%, respectively (all \(p < 0.0001\)), as well as for overall QOL score (+17%; \(p < 0.0001\)) following cardiac rehabilitation. Although elderly patients typically have significantly lower hostility scores and lower prevalence of hostility than the younger patients, hostility scores still improved modestly (−19%; \(p = 0.06\)) following cardiac rehabilitation, but elderly patients with high hostility scores at baseline had more marked improvements following rehabilitation (hostility score, −48% \([p < 0.001]\); QOL, +23% \([p < 0.001]\)).

Depression remains a relatively common symptom in elderly patients following major CAD events, with a point prevalence rate of 18%.\(^18\) These patients have reduced exercise capacity, lower HDL levels, more anxiety, hostility, and somatization, and lower QOL scores than elderly patients without depression. Following cardiac rehabilitation, these patients had 57% reductions in their depression scores (\(p < 0.0001\)), > 50% reductions in the prevalence of depression, and 32% improvements in their QOL scores, as well as marked improvements in exercise capacity, HDL, and other CAD risk factors.

Although elderly is typically defined as > 65 years of age, most experts agree that the majority of patients 65 to 75 years of age are still “relatively” young, and limited data are available for “very” elderly patients (eg, those > 75 or 80 years of age). We previously analyzed a group of 54 patients who were ≥ 75 years of age (mean age, 78 ± 3 years) following cardiac rehabilitation.\(^16\) The very elderly