Aerobic and resistance exercise improved pain and performance in knee osteoarthritis


Objective
To compare the effectiveness of aerobic exercise and resistance exercise with a health education program in older adults with knee osteoarthritis (OA).

Design
Randomized, single-blind, controlled trial with 18-month follow-up.

Setting
2 clinical centers in the United States.

Patients
439 patients (mean age 69 y, 70% women) with confirmed knee OA. Inclusion criteria were age ≥ 60 years; frequent knee pain; and difficulty with walking, climbing stairs, getting in and out of a car, rising from a chair, lifting and carrying groceries, getting out of a bed or bathtub, shopping, cleaning, and self-care. Exclusion criteria were a medical condition that prevented safe study completion, inflammatory arthritis, regular exercise, current residence in or plans to move into a long-term-care facility, inability to walk unassisted, or participation in another study. Follow-up was 83%.

Intervention
Patients were allocated to aerobic exercise (n = 144), resistance exercise (n = 146), or health education (n = 149). Aerobic exercise (walking) and resistance exercise (9 exercises) consisted of a supervised 3-month, facility-based program followed by a 15-month home-based program. Sessions lasted 1 hour and were held 3 days a week. Health education was done by a trained nurse. During months 1 to 3, sessions included a videotape presentation, distribution of printed information, and periods for questions and socializing; telephone interviews were done on a biweekly basis in months 4 to 6 and on a monthly basis in months 7 to 18.

Main outcome measures
Self-reported disability. Secondary outcomes were knee pain, physical performance assessment (walking, climbing stairs, lifting and carrying, and getting in and out of a car), radiographic score, aerobic capacity, and knee strength (flexion and extension).

Main results
Compared with patients who received health education, patients assigned to aerobic exercise and resistance exercise had fewer self-reported disabilities (P < 0.001 and P = 0.003 for the aerobic and resistance groups, respectively), less pain (P = 0.001 and P = 0.02), and greater flexion strength (P = 0.004 and P = 0.01). Compared with the education group, physical performance was better in the aerobic group for all measures and better in the resistance group for all measures except stair climbing (P < 0.05 for all groups). Groups did not differ for radiographic score or knee extension strength.

Conclusion
Aerobic exercise and resistance exercise improved measures of self-reported disability, pain, and physical performance compared with health education in older adults with knee osteoarthritis.

Sources of funding: National Institutes of Health and General Clinical Research Center.

Abstract and Commentary also published in ACP Journal Club, 1997;127:8.

Knee OA is an important cause of pain and activity limitation in elderly persons. Although short-term studies show that aerobic exercise programs for OA are safe and effective, few physicians routinely recommend them (1, 2). Because osteoarthritis is a chronic disease, information on interventions that last more than a few months would be helpful.

Ettinger and colleagues evaluated the effects of an 18-month intervention of low-impact aerobic exercise, resistance exercise, and a health education program on physical disability and pain in older adults with knee OA. Results from this study suggest that aerobic exercises are safe and effective for older adults with knee OA. Although the study was single-blind, the results provide evidence to support the use of aerobic exercises as a viable treatment option for knee OA.

Therefore, the treatment of knee OA should include both a moderate-intensity exercise program and standard pharmacologic therapy. Future research in knee OA should be directed toward the refinement of exercise prescriptions.

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References