

# Aerobic and resistance exercise improved pain and performance in knee osteoarthritis

Ettinger WH Jr, Burns R, Messier SP, et al. A randomized trial comparing aerobic exercise and resistance exercise with a health education program in older adults with knee osteoarthritis. The Fitness Arthritis and Seniors Trial (FAST). *JAMA*. 1997 Jan 1;277:25-31.

## 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  $\geq$  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

## Commentary

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. Modest but significant reductions in disability and pain occurred in both exercise groups. The maximum improvement was seen at the end of the 3-month supervised exercise period. The beneficial effects of exercise were generally seen in

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).

persons of both sexes, black persons, white persons, obese persons, and persons older than 70 years of age.

This is the first randomized exercise intervention study for knee OA to last for 18 months. Other studies of interventions for OA and rheumatoid arthritis have shown improvements in pain and disability, but the interventions were only done for 2 to 3 months (1, 2). It is difficult to compare the effect of this study by Ettinger and colleagues with other exercise intervention studies in knee OA because the clinical assessments were done at different time points and the disability scales were dissimilar.

The treatment of OA is directed toward reduction of pain and an improvement in function. This study showed that aerobic and resistance exercise of moderate intensity are safe and effective therapies for OA.

## 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.*

*For article reprint: Dr. W.H. Ettinger, Jr., Medical Center Boulevard, Winston-Salem, NC 27157-1052, USA. FAX 910-716-2273.*

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

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.

Nancy Lane, MD  
University of California  
San Francisco, California, USA

## References

1. Kovar PA, Allegrante JP, MacKenzie CR, et al. Supervised fitness walking in patients with osteoarthritis of the knee. A randomized controlled trial. *Ann Intern Med*. 1992; 116:529-34.
2. Minor MA, Hewett JE, Webel RR, Anderson SK, Kay DR. Efficacy of physical conditioning exercise in patients with rheumatoid arthritis and osteoarthritis. *Arthritis Rheum*. 1989;32:1396-405.