

Trial Specifies Exercises That Work for Knee OA

BY BRUCE JANCIN
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VIENNA — While practice guidelines emphatically agree that physical exercise is a crucial element of knee osteoarthritis management, no expert consensus exists regarding how best to deliver such treatment.

Given the lack of specific recommendations, it's particularly instructive to consider the lessons offered by one landmark study in the field: the Fitness Arthritis and Seniors Trial (FAST), Dr. Leena Sharma, said at the annual European Congress of Rheumatology.

FAST stands out in a number of ways, not least that the 18-month duration of the exercise interventions was unusually long compared with other studies in this area—and altogether fitting given that exercise is today presented to osteoarthritis patients as a lifelong intervention, noted Dr. Sharma of Northwestern University, Chicago.

In addition, FAST's primary end point was highly clinically relevant: prevention of new disability in activities of daily living, such as bathing, dressing, and moving from bed to chair. The adjusted relative risk of developing such disability was reduced by 47% in the aerobic exercise group compared with controls, and by 40% in those randomized to resistance exercise (*Arch. Intern. Med.* 2001;161:2309-16).

FAST was a two-center, single-blind, randomized trial involving 439 community-dwelling patients with symptomatic knee osteoarthritis. Participants were assigned to one of three groups: aerobic exercise, strength training, or a control arm featuring an 18-month health education and support program. Both exercise arms began with a 3-month facility-based supervised program followed by a 15-month home-based program.

"There was a lot of contact—and this is crucial for osteoarthritis management," Dr. Sharma stressed. Indeed, the exercise leader visited patients at home on four occasions and phoned them six times during months 4-6, talked with them on the phone every 3 weeks during months 7-9, and talked with them monthly thereafter.

Participants kept exercise logs throughout the 18 months. Adherence was defined simply as the number of exercise sessions completed divided by the number prescribed. Dr. Sharma is convinced this played a key role in the low study dropout rates—9.8% in the resistance exercise arm, 13.6% with the aerobic program.

The aerobic exercise intervention entailed three 1-hour workouts per week. Each began with a 10-minute warm-up involving slow walking and flexibility stretches. This was followed by 40 minutes of walking at 50%-70% of heart rate reserve as determined in an exercise stress test, then a 10-minute cool-down, Dr. Sharma said.

During disease flare-ups, short rest periods could be interspersed within the workout sessions.

Resistance training in FAST also involved three hour-long sessions per week. Patients performed two sets of 12 repetitions of nine exercises working the upper and lower extremities. Dumbbells and cuff weights were used to increase resistance. Patients began using very light weights and gradually increased them so long as they could complete two sets of 12 repetitions.

Unlike in the controlled setting of FAST, however, in clinical practice an exercise prescription is not an either/or matter of aerobics or strengthening. The exercise prescription for patients with osteoarthritis should include both aerobic and resistance training tailored to the individual, she said. ■



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CLINICAL GUIDELINES FOR FAMILY PHYSICIANS

Exercise Rx for Osteoarthritis

BY NEIL S. SKOLNIK, M.D., AND ADRIAN WILSON, D.O.

As the population in the United States and other industrialized nations ages, the prevalence of osteoarthritis continues to grow. Some studies indicate an increase from 43 million to 60 million U.S. cases by the year 2020.

Once thought to be a normal process of aging, osteoarthritis (OA) is now understood to result from a combination of genetics, joint inflammation, localized trauma, and other biochemical processes. Symptoms present most commonly in patients aged 40 years and older. Such patients report articular pain, especially of weightbearing joints, typically exacerbated by activity and relieved by rest.

Management goals for OA include controlling pain; decreasing swelling and joint restriction; minimizing disability; preventing disease progression; and improving overall quality of life. Although analgesics offer an initial treatment option, several studies suggest that a multidisciplinary approach provides more efficacious symptom relief.

Therapeutic exercises and manual therapy have been investigated as possible adjuncts to improve flexibility and strengthen the muscles that support affected joints, thereby decreasing overall pain symptoms and increasing functional capacity. The Ottawa Panel evidence-based clinical practice guidelines consider various strengthening exercises, general physical activity, and manual therapy combined with exercises (*Phys. Ther.* 2005;85:907-71).

Exercise Terminology

The following terms are used in the guidelines and may be valuable to review:

- ▶ Isometric exercise involves muscle contraction with little or no shortening of the muscle body.
- ▶ Isotonic exercise is a dynamic exercise in which the load is kept constant. Resistance is a product of the load but does not stay constant.
- ▶ Isokinetic exercise is a dynamic exercise in which the speed of motion is controlled by varying the resistance.
- ▶ Concentric contraction utilizes contractility of muscle fibers, causing a shortening of the muscle body.
- ▶ Eccentric contraction utilizes extensibility and occurs as the muscle lengthens.
- ▶ Static contractions involve muscles that do not change length.

Strengthening

A lower-extremity exercise program should be recommended as soon as a patient is diagnosed with knee OA.

For patients with OA knee pain, the Ottawa Panel found good evidence that lower-extremity strengthening in general—and lower-extremity isometric strengthening in particular—improve one's ability to get up from the floor and to climb stairs. Lower-extremity strengthening maneuvers, such as leg lifts against an immobile resistance, improve performance on timed functional tasks.

For Kellgren-Lawrence grades 2 and 3 knee OA, there is good evidence that concentric re-

sistance training improves pain at rest and while performing activities.

Good evidence also supports the benefits of at-home strengthening programs for improving knee OA pain, functional status, energy level, and range of motion in flexion. For tibiofemoral OA, progressive lower-extremity strengthening exercises are recommended. There is good evidence that this form of exercise, which involves increasing levels of resistance, improves range of motion and pain at rest. For hand OA, there is good evidence that strengthening relieves pain and improves grip force.

Physical Activity
For patients with knee OA, there is good evidence that whole-body functional exercise improves pain, mobility, walking, and activities of daily living.

In addition, good evidence suggests that walking itself eases pain, while it also improves functional status, stride length, aerobic capacity, and energy level. Walking also reduces the need for medication and improves one's ability to perform daily living activities.

There is also good evidence that water jogging improves aerobic capacity in patients with chronic pain and joint stiffness, and that yoga improves OA of the distal interphalangeal (DIP) and proximal interphalangeal (PIP) joints of the hand during activity and range-of-motion exercises.

A Multidisciplinary Approach

Good evidence supports the use of manual therapies—such as massage, osteopathic manipulation, and chiropractic techniques—to ease OA pain. No benefits have been seen, however, in terms of function.

The Bottom Line

Of 26 randomized, controlled trials, 16 positive recommendations were made for management of osteoarthritis. The highest-quality evidence supports lower-extremity strengthening and lower-extremity isometric strengthening; resistance training; an at-home strengthening program; progressive lower-extremity strengthening; hand strengthening; whole-body functional exercise; a walking program; water jogging; and yoga. Manual therapies are useful adjuncts in a multidisciplinary approach to OA management.



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