Functional Therapy Aids Knee OA Rehab

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BOSTON — Exercises that simulate the mechanically challenging activities of daily living lessen energy expenditures and compensations associated with knee osteoarthritis, Dr. Anthony M. Reginato said at the 10th World Congress on Osteoarthritis.

As such, functional interventions should be an important component of rehabilitation therapy, he said at the congress, which was sponsored by the Osteoarthritis Research Society International.

In a double blind, randomized trial, Dr. Reginato and his colleagues at Massachusetts General Hospital in Boston analyzed chair rise and box lifting in patients with knee osteoarthritis to determine if functional training or strengthening exercises led to improvements in mechanical energy expenditures (MEE), mechanical energy compensations (MEC), linear and angular momentum, and/or performance duration.

The study included 26 individuals, aged 43-86 years, who had Kellgren-Lawrence grade 2 or 3 knee osteoarthritis and at least two functional limitations on the SF36 physical functioning subscale. Participants were randomized to receive 8 weeks of physical therapy comprising either strength training or functional training.

"The goal of strength training is to address specific impairments, including range of motion and the ability to generate muscle force," said Dr. Reginato.

In contrast, functional training simulates activities of daily living, such as gait, rising from a chair, and stair climbing, at different speeds and levels of difficulty, the goal of which is to improve neuromuscular control of the body, with specific focus on the individual's abilities and safety limits, he explained.

At baseline and postintervention, each participant completed a chair rise test, which required arising from a backless chair, and a box lift test, which required hoisting a plastic case holding a 5 kg metal disk onto a table.

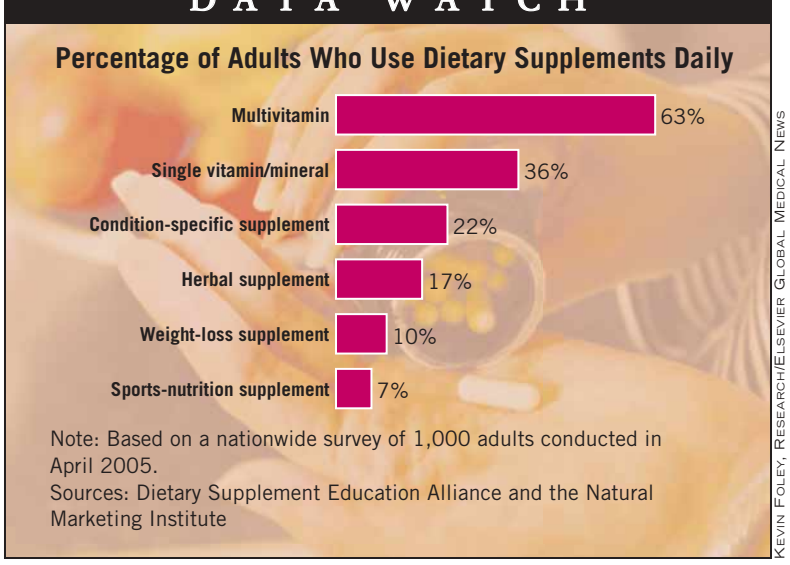
During the tasks, ankle, knee, hip, and back MEE and MEC were calculated. Maximum whole body angular momentum, maximum whole body anterior posterior linear momentum, and maximum whole body vertical linear momentum, as well as the intervals between the start and end of each task were also assessed.

Using univariate analysis of covariance and multivariate analysis of variance to compare between-group differences in score changes relative to baseline, the investigators determined that, in the chair rise, the functional training group had significantly more improvement in energy expenditures and compensations by increasing ankle energy expenditure and decreasing back compensation, compared with the strength training group. And while there were no significant differences in chair rise interval times between the groups, the functional training group had a greater change from baseline in this measure.

In the box lift test, both groups increased their MEE in the back during the "no transfer" phase of lifting, although the strength training group had significantly higher changes in this measure, Dr. Reginato reported. In the transfer phase, the strengthening group had a significantly greater change in MEE in the back, compared with the functional group, which showed a decrease in this measure, and greater change in maximum whole body angular momentum.

The findings suggest that both functional and impairment-level interventions have important roles in the treatment of knee osteoarthritis, Dr. Reginato said. ■

DATA WATCH



KEVIN FOLEY, RESEARCH/ELSEVIER GLOBAL MEDICAL NEWS

ALTERNATIVE MEDICINE

AN EVIDENCE-BASED APPROACH

Rose Hip Powder for Osteoarthritis

Rationale for Use

Studies of the mechanisms of action of a standardized formulation of rose hip powder showed that it lowered in vivo levels of C-reactive protein, from a mean of 8.25 mg/L to 6.67 mg/L. In addition, it reduced the in vitro migration rate of inflammatory polymorphonuclear lymphocytes (Inflammopharmacology 1999;7:63-8).

A proprietary formulation, Hyben Vital (Hyben Vital International, Langeland, Denmark), has been available in Scandinavia for a decade, and is imported to the United States by EuroPharma, Green Bay, Wisc., and marketed as LitoZin. The plants are a specific subspecies, *Rosa canina,* and are grown in Denmark and Sweden according to good agricultural practice. Computerized techniques ensure that temperatures during the drying process do not exceed 40° C, and the dry powder is controlled according to vitamin and mineral content.

► Rose hip powder has shown anti-inflammatory effects in vitro and in vivo.
► Scandinavian clinical trials have found significant benefits and few adverse effects among patients with osteoarthritis treated with a standardized proprietary formulation of rose hip powder.

Early OA: The Danish Study

Hyben Vital was evaluated in a double-blind, placebo-controlled, crossover trial that included 94 outpatients with osteoarthritis (OA) who were recruited from the department of rheumatology at Copenhagen County Hospital Glostrup and from the Institute for Clinical Research, Kolding, Denmark.

The 54 women and 40 men were randomized to 5 g of rose hip powder per day or matching placebo. Those who were using NSAIDs were advised to continue with the same dose throughout the trial, but they were encouraged to reduce their intake of analgesics such as acetaminophen (paracetamol) and opioids after the first 3 weeks of each study period.

The primary outcome measures were scores on the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and consumption of analgesics during the treatment periods.

After 3 weeks of active treatment, WOMAC scores for joint pain declined from 33.7 to 29.4, which was a statistically significant reduction. After 3 weeks of placebo, scores increased from 33.7 to 35.3 (Scand. J. Rheumatol. 2005;34:302-8).

Similar, although nonsignificant, results were seen at 3 months.

The percentage of patients who experienced a reduction in their WOMAC joint pain scores after 3 weeks of the active treatment was significantly higher, at 82%, than after placebo, at 49%. This 82% response rate was higher than has been reported in most studies evaluating herbal therapies, according to lead investigator Dr. Kaj Winther, of the department of clinical biochemistry, Copenhagen County Hospital Gentofte.

The use of acetaminophen rescue medication declined by 40% among patients who reported using the drug. There also was a decrease in the use of opioid medications such as tramadol. The authors suggested that this decrease in use of analgesic medications may explain the finding that joint pain scores no longer showed statistical improvements at 3 months.

Advanced OA: The Norwegian Study

In another study, 100 patients with long-standing (2-12 years) OA who were on a waiting list for hip or knee replacement were randomized to 5 g of rose hip powder daily or placebo for 4 months. The primary outcome was hip or knee mobility; secondary outcomes included difficulties in performing activities of daily living, patients' overall assessment of effectiveness, and pain level. Four patients withdrew from the study.

Patients in the active treatment group showed significant improvements at 4 months in passive hip flexion, external rotation, and internal rotation, while those in the placebo group showed significant improvements in passive hip internal rotation but not in flexion or external rotation. Changes in passive flexion of the knee did not differ significantly between the two groups.

Patients in the active treatment group had significant improvements in several activities of daily living such as walking and getting in and out of a car, and had significantly greater pain relief, compared with the placebo group. At month 4, 64.6% (31/48) of patients receiving rose hip powder had some pain relief, with some reporting almost total relief. In the placebo group, 56.3% (27/48) reported no pain relief, while 43.8% (21/48) had some degree of pain improvement (Curr. Ther. Res. 2003;64:21-31).

In the rose hip group, seven patients reduced their consumption of NSAIDs and none increased their intake. In the placebo group, four were able to reduce their use of NSAIDs and four increased their use.

Safety and Outlook

In the Danish study, seven patients in each group dropped out of the study. Side effects of rose hip treatment such as diarrhea and constipation were few and comparable to those seen with placebo. The investigators noted that tests on healthy volunteers and patients taking warfarin had shown no involvement or effects on platelet aggregation or on the arachidonic acid pathway, and suggested that this might explain the lack of adverse effects seen with drugs commonly used for OA.

In the Norwegian study, mild gastrointestinal distress in two patients in each group was the only adverse effect reported.

Long-term data are needed to ensure safety, however. Dr. Winther hopes to undertake longer studies and also to investigate rose hip powder as prophylaxis for OA in a large population over a period of 5-10 years.

In an interview, Dr. Winther said that initially he had been a skeptic about the treatment. Rose hips have long been a popular fruit in Scandinavia for their vitamin C content, he said.

"In my home we would go out in the autumn and pick rose hips and use them in marmalade for their vitamin C. If you had told me it would help prevent a cold or the flu, I would have believed you, but if you said it would help pain from OA, I wouldn't have believed you. I heard about this for 5 years before I finally decided to do a trial," he said.

—Nancy Walsh