

High Intensity Exercise Does Not Appear to Promote Worsening of RA

(summarized by Jon Giles, M.D.)

Exercise is beneficial for maintaining muscle strength, joint mobility, and cardiovascular health. However, many patients with rheumatoid arthritis (RA) do not exercise because of pain and fear of joint injury. Several studies of aerobic exercise or muscle strengthening in RA patients have been shown to be safe and beneficial. However, the long-term safety and "sustainability" of intense exercise programs in RA is unknown. In many of these studies, exercise programs were unsupervised, with patients given written or brief instruction as to form and frequency of exercises. Here, De Jong and colleagues evaluate the safety and efficacy of a supervised, long-term, high-intensity combined aerobic exercise and strength-training program (*A&R* 2003;48; 2415).

METHODS Subjects were recruited from four rheumatology practices in the Netherlands. Subjects age 20-70 years with RA who were healthy enough to exercise, taking stable DMARDs for three months prior to beginning the study, and with no history of weight-bearing joint arthroplasty were randomized to intensive exercise (RAPIT: Rheumatoid Arthritis Patients in Training) or usual care(UC).

Subjects randomized to the RAPIT group participated in a supervised 75-minute exercise program two times a week. Each exercise session consisted of 20 minutes of bicycle training with exertion kept at 70-90% of predicted maximal heart rate, 20 minutes of weight bearing exercises, and 20 minutes of impact-delivering sporting activities, i.e. basketball. Subjects randomized to UC were permitted physical therapy, as attending physicians deemed necessary, but were not prescribed any weight-bearing or impact-delivering exercises or activities.

Subjects were evaluated at baseline, and every 6 months for two years for effectiveness and safety of the intervention. The primary endpoint of effectiveness was functional ability as determined by the McMaster Toronto Arthritis Patient Preference Disability Questionnaire (MACTAR) and the Health Assessment Questionnaire (HAQ). Secondary endpoints of effectiveness were physical capacity and emotional status. Physical capacity was assessed in terms of aerobic capacity by means of a standardized ergometer, and muscle strength of the knee extensors with an isokinetic dynamometer.

Emotional status was assessed with the Hospital Anxiety and Depression Scale (HADS). The safety of the intervention was assessed primarily by radiographic progression of RA through analysis of plain radiographs of the shoulders, elbows, hips, knees, ankles, and subtalar joints using the Larsen method. The secondary safety endpoint was assessed with the Disease Activity Score with four variables (DAS4). Clinical outcomes assessors were blinded to treatment allocation.

RESULTS 300 patients were equally randomized to high-intensity exercise (RAPIT) or usual care (UC). Median age for the RAPIT and UC groups at baseline was 54 and 53.5 years respectively. Seventy-nine percent of participants in both groups were female. Although randomly assigned to each treatment group,

participants in the RAPIT group had a shorter duration of RA, less baseline radiographic damage, and fewer were taking DMARDs at baseline (78% vs. 89% in the UC group). 281 subjects completed the study period of two years. Functional ability, as measured by the MACTAR questionnaire, was significantly improved in the RAPIT group compared to the UC group at 12 months, and continued until the study conclusion. The mean difference between the RAPIT vs. UC group at the study conclusion as measured by the MACTAR questionnaire was 3.1 points. The mean difference in the change in HAQ score did not significantly differ between the two groups.

Aerobic fitness initially improved in both groups, albeit to a greater extent in the RAPIT group at six months. However, by two years, aerobic fitness showed net improvement in the RAPIT group and net worsening in the UC group. The difference in the two groups at all evaluation points was statistically significant.

Muscle strength improved in both groups as well, again more rapidly in the RAPIT group as evaluated at 6 months. Muscle strength continued to improve in the RAPIT group out to the 24-month mark while remaining constant in the UC group. The difference between the two groups was significant at the 12, 18, and 24 month evaluation times.

Emotional status as measured with the HADS score improved in the RAPIT group by a median of -1.2 points (baseline score 11.0 points). In the UC group, the change in HADS score from baseline was slightly higher at 24 months (+0.1 points). The differences between the two groups were significant at 12 and 24 months.

No change in median radiographic damage of the large joints was found in either group. In a sub-analysis of only the participants with radiographic progression, most were found to have longer disease duration and more radiographic damage at baseline, and this effect was more pronounced in the RAPIT group.

Both groups demonstrated slight improvements in DAS4 scores over the study period (-0.7 vs. -.09 by 24 months for the UC and RAPIT groups, respectively). The differences between the groups were not statistically significant at any time point. For both groups, no change in ESR or general health was observed over the study period.

CONCLUSIONS High intensity exercise is more effective in improving functional ability, aerobic fitness, and muscle strength than usual care in subjects with RA. High intensity exercise does not appear to promote worsening of RA in terms of radiographic progression.

EDITORIAL COMMENTS This study complements previous studies that support the liberal prescription of exercise in persons with RA, adding assurance of continued efficacy when the upper extreme of intensity over a variety of exercise modalities is applied. What is somewhat discouraging, however, is the modest overall magnitude in the changes, especially when factoring in that the target

population for this study design (i.e. those most willing and able to engage in an intense exercise regimen) are those most likely to succeed overall. However, for the same reasons, this is also the group that is the least deranged from normal at baseline, and are thus less likely to show dramatic differences.

The use of standardized measures for monitoring radiographic progression of RA activity is problematic for use as the primary safety measurement. For one, it does not take into account other potential detrimental effects of intense exercise in this population, i.e. tendon, ligamentous, and other soft tissue injuries. Additionally, it is impossible to disentangle the effect of RA activity (i.e. chronic inflammation) from the potential contribution of exercise on change in radiographic progression.

Overall, this study serves to corroborate the available literature supporting the use of exercise in persons with RA. However, careful monitoring for disease activity and progression is still advised. Further studies comparing high-intensity vs. low or moderate-intensity (i.e. "lifestyle") exercise are needed in order to identify the most effective and safest exercise programs for patients with RA.