High-intensity resistance training restored lean body mass and physical function in patients with rheumatoid arthritis

Synopsis


Question: Can high-intensity progressive resistance training (PRT) restore muscle mass and improve function in patients with rheumatoid arthritis (RA)? Design: A randomized, controlled trial. Setting: A hospital rheumatology department in the UK. Participants: Men and women > 18 years, fulfilling the American College of Rheumatology 1987 revised criteria for the diagnosis of RA with mild to moderate disability (functional class I and II) and on stable medication. Randomisation of 36 participants allocated 18 to the PRT group and 18 to the control group. Interventions: The PRT program was designed according to the American College of Sports Medicine recommendations, and consisted of 3 sets of 8 repetitions with a load corresponding to 80% of the 1-repetition maximum with 1–2 minutes of rest between the sets. The exercises (leg press, chest press, leg extension, seated rowing, leg curl, triceps extension, standing calf raises, and bicep curl) were performed twice a week for 24 weeks on a multi-stack machine in a community gym. The control group sessions included 10 minutes of low-intensity ROM exercises twice weekly at home, considered as insufficient intensity to elicit muscle hypertrophy. Outcome measures: The outcomes were collected immediately following the training period and included: total and regional lean body mass (LBM), maximal voluntary isometric knee extensor strength at 90° flexion (KES), objective physical function measures (30-second arm curl, 30-second chair stand, and 50-foot walking) and patient-reported function (The Multidimensional Health Assessment Questionnaire). Results: 13 participants (72%) in the PRT group and 15 (83%) in the control group completed the study. Participants in the PRT group completed on average 73% of the sessions, and participants in the control group completed on average 54% of the sessions. At baseline, the mean (SD) total LBM in the PRT group was 37.2 (3.9) kg compared to 40.4 (8.9) kg in the control group. PRT increased total LBM by 1.5 (1.5) kg compared to a slight decrease in the control group (p = 0.006 for between group difference). KES and objective physical function measures increased between 17% and 19% in the PRT grouped compared to no change in the control group (p values ≤ 0.027 for between group differences). Self reported function remained unchanged in both groups. Conclusion: Progressive resistance training can restore the muscle mass and the functional capacity in patients with established, stable RA.

Commentary

Rheumatoid arthritis (RA) is associated with impaired physical function, loss of lean body mass, adiposity, and increased risk for cardiovascular diseases. Thus, the present study focusing on the efficacy of Progressive Resistance Training (PRT) in restoring muscle mass in patients with RA is of utmost importance, both for the patients and for health care providers.

The exercise intervention followed current guidelines for PRT from the American College of Sports Medicine (2009). To our knowledge, this is the first study of an isolated PRT intervention in RA patients. The present study demonstrated that PRT is effective in restoring muscle mass and physical function in RA patients with low degree of disability (function class I and II).

From a clinical perspective the PRT group was supervised during each training session. This supervision seems to have had a positive effect on adherence to training in the PRT group, indicating this as an important aspect when recommending PRT to patients with RA.

Further, a relatively long adaptation period of sub-maximal training (6 weeks) was applied when introducing PRT. The adaptation period may have contributed to the participants reports of no training related injuries or other adverse events. A similar adaptation period was reported by Häkkinen et al (2005), who also concluded that PRT was well tolerated by patients with RA.

A strength of the present study is the use of ‘the gold standard’, the DXA scanner, in assessing body composition. However, we consider the imbalance in lean body mass at baseline between the groups as a weakness. This may be due to the small sample size, with only 28 participants included in the main analysis.

In conclusion, this study showed promising results after PRT in a selected group of patients with RA, which should encourage physiotherapists to consider PRT for patients with mild to moderate disability. However, further research is warranted before the results can be generalised to patients with more affected joints and active disease.

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References