Effects of Training Loads on Short-term Strength Adaptations in Older Adults

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ABSTRACT

During the initial period of resistance training the rapid gains in muscular strength are mainly due to neuromuscular factors rather than morphological changes in the muscle tissue. It has been hypothesized that improvements in muscular strength may be elicited by simply practicing the resistance training movement and initial gains may be comparable to gains achieved through using an overload. PURPOSE: To compare changes in muscular strength in healthy older adults participating in a resistance training program using traditional resistance (TR) versus minimal resistance (MR). METHODS: 40 untrained, healthy older adults (mean±SD age: 67.7±7.5; BMI: 29.9±6.9) were recruited and randomly assigned to one of two groups: 1) TR group or 2) MR group. Training included five resistance training exercises (Bench Press, Lat Pulldown, Cable Upright Rows, Triceps Pressdown, and Leg Curl) for these sets of ten repetitions on two days per week for four weeks. Subjects in the TR group exercised using 75% of their predicted one repetition maximum (1RM). Subjects in the MR group used a 5 ft. PVC pipe for the bench press exercise, and the lowest weight on the selectorized weight training machines for the other exercises. Following the pre-testing six follow-up tests were conducted. All five resistance training movements were tested with a 4RM to 6RM testing procedure and 1RM strength were predicted using appropriate equations. Results of this study indicate that initial improvements in muscular strength may be elicited by practicing proper exercise technique without using resistance overloads. This style of program design may provide a safe and effective method of introduction to resistance training in older adults.

INTRODUCTION

• Mainly due to neuromuscular factors rapid strength gains may be observed during the initial period of training in untrained subjects.
• Neuromuscular adaptations may be more pronounced in previously untrained older adults.
• Muscular strength improvements may be elicited by simply practicing the resistance training movement with minimal resistance and initial gains may be comparable to gains achieved through using an overload.

PURPOSE

To compare the changes in muscular strength in healthy, previously untrained older adults participating in a resistance training program using traditional resistance (TR) versus minimal resistance (MR).

METHODS

• Longitudinal training intervention with pre- vs. post-test design.
• Untrained older adults were randomly assigned to TR & MR groups.
• Five exercises were performed to include: Bench Press, Lat Pulldown, Cable Upright Row, Triceps Pressdown, and Leg Curl.

RESULTS

• Significant strength improvements for all five exercises were observed in both the TR and MR groups from pre- to post-intervention (p<0.0001).
• MR group showed similar strength improvements as the TR group from pre- to post-test.
• Range of strength improvements was 13.1% to 36.0% in the TR group and 11.1% to 27.4% in the MR group.
• Group by time interactions were not significant for the Bench Press (p=0.967), Lat Pulldown (p=0.583), Cable Upright Row (p=0.935), Triceps Pressdown (p=0.311), and Leg Curl (p=0.290) exercises.

CONCLUSION

• Practice of proper exercise technique without using resistance overloads may promote initial strength gains similar to a traditional resistance training program in untrained older adults.
• This style of program design can be a safe and effective method of introducing resistance training to older adults.

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