

Comparison of the Effects of Two Different Resistance Training Programs on Strength in Older Males.

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ABSTRACT

Age-related decrement in skeletal muscle strength can be attenuated by resistance training. Blood-flow restriction training has shown promising results when working with lighter loads, mimicking the response to resistance training at moderate-to-high-intensities. **PURPOSE:** The purpose of this study was to compare the effects of 8 weeks of blood flow restriction (BFR) training and traditional endurance resistance training on isotonic, isokinetic, isometric strength in older males. **METHODS:** A total of 17 males (57.0 yr \pm 4.6 yr) completed the study. Subjects were randomly assigned to two training groups: blood flow restriction (BFR; n= 9) or endurance resistance training (END; n = 8). Prior to exercise training, baselines measurements were recorded, including height, weight, one repetition maximum (1RM), and unilateral knee extension testing to determine maximal voluntary contraction (MVC) and isokinetic torque at 60°/sec and 180°/sec. Training was held three times a week in a training room under laboratory settings and under the supervision of an experienced and certified strength and conditioning specialist, who ensured that subjects used proper exercise form and provided verbal encouragement. The following machine-based exercises were performed: Leg press, leg extension, leg curl, chest press, and shoulder press. Following a warm-up consisting of a 5-minute walk or jog, the BFR group performed 4 sets of 20 repetitions of the 5 exercises at 20-30% 1RM, while the END group performed 4 sets of 15 repetitions of the 5 exercises at 40-65% 1RM, with 30-60 seconds of rest between exercises. Cuffs were placed at the upper most portion of the limbs. Initial cuff tightness was measured between 30 and 40 mmHg for upper and lower limbs, and final pressure of the cuffs was between 140 and 160 mmHg for upper body and 160 - 200 mmHg for lower body. BFR group rested 3-5 minutes between upper and lower body exercises. Following completion of the 8-week training, the measurements at baseline were re-recorded. **RESULTS** One-way ANOVA resulted in no difference between groups at baseline. Time main effects were seen in 1RM ($p \leq 0.05$), isokinetic torque at 60°/sec ($p \leq 0.05$) and 80°/sec ($p \leq 0.05$), and MVC ($p \leq 0.05$) tests. **CONCLUSION:** The BFR and END training protocols resulted in similar results on improving strength after 8 weeks of resistance training. It could be speculated that even though half the weight was lifted during the BFR sessions compared to the END sessions, the BFR-related local and systemic changes elicited similar improvements in isotonic, isokinetic, and isometric strength in older males.