Velocity Training Induces Power-Specific Adaptations In Highly Functioning Older Adults

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OBJECTIVE:
The main purpose of this study was to test the efficacy of high velocity training in healthy older persons. A twelve-week trial compared high velocity resistance training with a self-paced walking program in forty volunteers over 70 years of age. Three days per week resistance training consisted of lower extremity exercises (step ups, chair rises and plantar flexion) performed at high velocity with weekly increases in resistance. Leg press training began in the 3rd week. Variables measured included leg press peak power and leg extensor strength . Functional performance outcomes included: 6 minute walk distance, Short Physical Performance Battery (SPPB), Physical Performance Test (PPT-8), and Short Form 36 (SF-36).

RESULTS:
Peak power improved 22% ($p = .004$) in the power trained group (3.7 ± 1.0 to 4.5 ± 1.4 W·Kg) but did not change in the walkers ($3.99 \pm .76$ to $3.65 \pm .94$ W·kg). Leg extensor power at resistances of 50, 60 and 70% of body weight increased 50, 77, and 141% respectively in the power-trained group ($p < .0001$), repeated measures ANOVA. Strength improved 22% in the power-trained individuals and 12% in the walkers ($p < .0001$). Training did not improve functional task performance scores in either group.

CONCLUSIONS:
This particular resistance training protocol focusing on speed of movement, improved leg power and maximal strength substantially but did not improve functional performance (as measured by the identified tests) in healthy high-functioning older volunteers.

DISCUSSION:
Eighty eight percent of the participant's daily repetitions consisted of a variety of lower extremity exercises incorporating weight belts and/or use of a box and other step up platforms. Only 12% of the daily repetitions used the Keiser leg press machine. In addition, the exclusion criteria was designed to reduce the risk of injury during the training protocol, but also resulted in a high functioning group which may have limited the potential for improvements in physical performance measures. Further study is warranted to determine if these types of "home-based" interventions may be useful in improving functional performance in older adults who have a more average level of function.

KEISER PIECES USED:
K400 Leg Press

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