

Older Adults: Don't Wait for Weights

Taaffe DR, Duret C, Wheeler S, Marcus R. Once-weekly resistance exercise improves muscle strength and neuromuscular performance in older adults. *J Am Geriatr Soc* 1999;47:1208–14.

Study Overview

Objective. To assess the effect of frequency of resistance training on muscle strength and neuromuscular performance in older adults.

Design. Randomized controlled trial.

Intervention. Subjects were assigned either to high-intensity resistance training 1 (EX1), 2 (EX2), or 3 (EX3) days per week for 24 weeks or to a control group. All exercise groups performed 3 sets of 8 exercises targeting the major upper and lower body muscle groups.

Setting and participants. 46 healthy men ($n = 29$) and women ($n = 17$) between 65 and 79 years of age who lived in the community and had not been involved in weight training for at least 12 months prior to the study. Twelve participants were assigned to the control group, 11 to the EX1 group, 12 to the EX2 group, and 11 to the EX3 group. Training took place at an exercise facility in an academic medical center. All participants maintained their usual diets and daily activities.

Main outcome measures. Dynamic muscle strength was evaluated using the 1-repetition maximum (1-RM) system with isotonic equipment every 4 weeks [1]. The 1-RM method measures the maximum weight that a person can move through a full range of motion without changing his or her body position (other than that required by the specific exercise motion). Bone mineral density and body composition were assessed with dual-energy x-ray absorptiometry, and neuromuscular performance was determined by timed chair rise and 6-meter backward tandem walk.

Main results. Exercise groups were equally adherent to their training regimens, with each group completing nearly all required exercise sessions. Muscle strength for each of the 8 exercises increased in the 3 groups compared with controls ($P < 0.01$), with no difference among the exercise groups at any measurement interval. The percentage of muscle strength improvement averaged 3.9 ± 2.4 (control), 37.0 ± 15.2 (EX1), 41.9 ± 18.2 (EX2), and 39.7 ± 9.8 (EX3). In the exercise groups compared with the controls, the time to rise

successfully from a chair 5 times decreased significantly ($P < 0.01$) at 24 weeks, and improvement in the 6-meter backward tandem walk approached significance ($P = 0.10$). Changes in chair-rise ability were correlated to percentage changes in quadriceps strength ($r = -0.40$; $P < 0.01$) and lean mass ($r = -0.40$; $P < 0.01$).

Conclusion

Performing resistance training 1 or 2 days per week can help older adults achieve muscle strength gains comparable to the gains from a regimen of 3 days per week as well as help improve neuromuscular performance.

Commentary

Exercise increasingly is being acknowledged as an effective means for people of all ages to improve their health, shorten periods of morbidity, and lengthen life [2]. Many exercise programs for the elderly focus on improving cardiovascular fitness, but recent studies have demonstrated the benefits of weight resistance training among this population [2,3]. Recent physician guidelines recommend weight training for older adults as a safe and effective way to enhance physical capabilities and maintain independence [2–4]. This study by Taaffe and colleagues is noteworthy because it shows that older adults can achieve substantial benefits by training with relatively low levels of weight over a modest time period at a lower frequency than generally recommended for younger adults.

Applications for Clinical Practice

Clinicians should inform their elderly patients about the benefits of resistance training even at modest levels and encourage them to include this type of activity in a routine exercise regimen.

"Outcomes Research in Review" is edited by Chris L. Pashos, PhD, Vice President and Executive Director of Pharmacoeconomics and Outcomes Research, Abt Associates Clinical Trials, Cambridge, MA, and Associate Editor, Health Policy, Journal of Clinical Outcomes Management. Dr. Pashos selects, summarizes, and provides the commentary on the studies that appear in this section.

References

1. Charette SL, McEvoy L, Pyka G, Snow-Harter C, Guido D, Wiswell RA, Marcus R. Muscle hypertrophy response to resistance training in older women. *J Appl Physiol* 1991;70:1912-6.
2. Pollock ML, Graves JE, Swart DL, Lowenthal DT. Exercise training and prescription for the elderly. *South Med J* 1994; 87:S88-95.
3. Nelson ME, Fiatarone MA, Morganti CM, Trice I, Greenberg RA, Evans WJ. Effects of high-intensity strength training on multiple risk factors for osteoporotic fractures. A randomized controlled trial. *JAMA* 1994;272:1909-14.
4. American College of Sports Medicine Position Stand. Exercise and physical activity for older adults. *Med Sci Sports Exerc* 1998;30:992-1008.

Copyright 2000 by Turner White Communications Inc., Wayne, PA. All rights reserved.