Muscle Quality. II. Effects Of Strength Training In 65 To 75 Year Old Men And Women

Tracy BL, Ivey FM, Hurlbut D, Martel GF, Lemmer JT, Siegel EL, Metter EJ, Fozard JL, Fleg JL, Hurley BF. Department of Kinesiology, College of Health and Human Performance, University of Maryland, College Park 20742, Maryland.

OBJECTIVES:
The purpose of this study was to compare the effects of a short-term strength training program on muscle quality in older men and women. Twelve older men (65-75 yr) and 11 older women (65-73yr) completed a 3day/week, 9 week unilateral leg strengthening program. Before and after completion of the program, 1 repetition maximum (1-RM), isometric force, isokinetic peak torque and magnetic resonance imaging (MRI) were used to measure changes in strength, muscle volume and muscle quality in the trained and untrained legs.

RESULTS:
Both groups significantly increased in strength, muscle quality and muscle volume as a result of ST. Men exhibited greater absolute increases in 1-RM (75$\pm$2 and 94$\pm$3 kg before and after ST) and in quadricep muscle volume (aprox. 1.753 and 1.955 cm^3) than women (42$\pm$2 & 55$\pm$3kg for 1-RM and aprox.1.125 vs. 1.261 cm^3 for muscle volume). However, the relative changes were similar for men and women in 1-RM (27 and 29% for men and women respectively), muscle volume (12% for both) and muscle quality (14 and 16% for men and women respectively). It should be noted that 1-RM strength in the untrained legs significantly increased in both groups.

SUMMARY:
Older men and women exhibit significant increases in strength, muscle quality and muscle volume as a result of 9 weeks of strength training. Older men and women also demonstrate equivilant strength training induced neural adaptations to the untrained limb. Older men exhibit greater absolute increases in muscle volume and 1 RM than women, but there was no significant gender difference in the muscle quality. This suggests that the observed strength increases are impacted by more than just muscle hypertrophy and that neural adaptations play a significant role.

KEISER PIECES USED:
Leg extension

Published in the Journal of Applied Physiology, 1999 Jan;86(1):195-201