

Exercise Training and Nutritional Supplementation for Physical Frailty in Very Elderly People

Maria A Fiatarone, M.D., Evelyn F. O'Neill, C.T.R.S., Nancy Doyle Ryan, D.T., Karen M. Clements, M.P.H., Guido R. Solares, Ph.D., Miriam E. Nelson Ph.D., Susan B. Roberts, Ph.D., Joseph J. Kehayias, Ph.D., Lewis A. Lipsitz, M.D., & William J. Evans, Ph.D. Hebrew Rehabilitation Center for Aged, Roslindale, MA; and the Department of Agriculture Human Nutrition Research Center on Aging, Tufts University; the Division on Aging, Harvard Medical School; the Department of Medicine, Beth Israel Hospital; the Gerontology Division, Brigham and Women's Hospital; the Division of Medical Physics, Department of Radiation Oncology, New England Medical Center all in Boston, MA.

OBJECTIVES:

The researchers randomly placed 100 frail nursing home residents aged 72-98 years into 4 separate groups for 10 weeks. They compared subjects engaged in: 1) strength training, 2) multivitamin supplementation, 3) both interventions, and 4) no intervention. Total energy intake was significantly increased only in the subjects who received both interventions (i.e. exercise & nutritional supplementation).

RESULTS:

Ninety-four percent of the subjects (63 women and 37 men) completed the study. Muscle strength increased by about 113% in the subjects engaged in resistance training, as compared with about 3% in the non-exercising subjects. Gait velocity increased by about 11.8% in the exercisers but declined by about 1% in the non-exercisers. Stair climbing power also improved in the exercisers when compared with the non-exercisers (by $\approx 28\%$ vs. $\approx 3.6\%$), as did the level of spontaneous physical activity. Cross-sectional thigh-muscle increased $\approx 2.7\%$ in the exercisers but declined by $\approx 1.8\%$ in the non-exercisers. The nutritional supplement had no effect on any primary outcome measure (i.e. strength, gait, etc.).

SUMMARY:

High-intensity strength training is a feasible and effective means of counteracting muscle weakness and physical frailty in very elderly people. In contrast, multivitamin supplementation without exercise does not reduce muscle weakness or physical frailty. Nutritional supplementation has often been used to help prevent physical frailty among dependent & frail older adults. This research clearly demonstrates that providing strength training opportunities for the very frail would be a much more effective use of resources than supplementation to prevent frailty.

KEISER PIECES USED:

Leg press.