Restoring Standing Height: Yet Another Benefit of Exercise for Osteoporosis

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Purpose: The utility of exercise for improving or maintaining bone mass is well-recognized. The ability of exercise to maintain or restore lost stature however has rarely been reported. Such a finding would have considerable clinical significance in light of the known relationships between stature, function and quality of life. We hypothesized a targeted heavy progressive resistance training program would increase back muscle strength and prevent loss of height in postmenopausal women with low bone mass.

Methods: Fifty postmenopausal women (66.3 ± 5.1 y) with low bone mass (FN or LS t-score: ≥1) who undertook twice weekly progressive heavy resistance training (EX) or a very low intensity home exercise program (CON) for 8 months were tested for height, LS BMD, WB lean mass (DXA, XR-800, Norland) and back extensor strength (BES) at baseline and follow-up. Between-group difference in change in height over time was examined by repeated measures ANOVA. Multiple regression analysis was used to determine the degree to which baseline values and change in BES, lean mass and LS BMD predicted variance in change in height.

Results: Change in height over the 8 month period differed significantly between groups (CON, -0.41 ± 0.28 vs EX, 0.60 ± 0.27 cm, P = 0.001). Change in BES (R^2 = 0.637, P = 0.032) and change in WB lean mass (R^2 = 0.310, P = 0.039) together accounted for almost three quarters of the variance in change in height (R^2 = 0.707, P = 0.038). The correlation of change in LS BMD with change in height approached significance (r = 0.518, P = 0.058), but did not contribute significantly to the regression model, P = 0.074).

Conclusion: Heavy progressive resistance training induced a mean net benefit of 1 cm in stature over the course of an 8 month training program in comparison with very lightly exercising controls. The clear relationship of changes in back extensor strength and lean mass to changes in height suggest heavy resistance training is a powerful therapy for the maintenance or restoration of height in postmenopausal women.

Abstract review categories (Poster cluster):

Biomechanics and Physical Activity (Physical Activity and Exercise)
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