BONE LOSS ACCOMPANYING WEIGHT LOSS: A RANDOMISED CONTROLLED WEIGHT LOSS STUDY USING DIET AND EXERCISE.

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Previous studies have shown a loss of bone mineral content (BMC) with short term, diet-induced weight loss, correlated with loss of fat not with loss of lean (Jensen at al. 1994). Exercise in a weight loss program was found to conserve lean tissue and fat contributed to the majority of weight lost (Pritchard et al. 1995). Exercise training is known to increase bone mineral content. The question is: does exercise in a long-term weight loss program prevent the diet-induced loss of BMC? This study aimed to determine the effects of changes in fat and lean tissue on BMC when diet, exercise or both were used in a long-term worksite weight-loss program.

Sixty six overweight male Telecom employees (BMI 26-34; age 35-55 years) were randomly assigned for 12 months to diet (D, n=24), exercise (E, n=22) or control (C, n=20). For a second 12 months C subjects combined diet and exercise (D+E, n=19). BMC, fat and lean were measured using dual energy Xray absorptiometry (DXA). Changes in body composition are tabulated for the 58 subjects who completed 12 months, and the 15 of group D+E who completed the second 12 months.

Means (±sem)	D n=18		E n=21		C n=19		D+E n=15	
% Body wt	-7.2 ***#	(0.8)	-3.0 **#	(0.8)	+0.03	(0.5)	-5.1 ***#	(1.0)
% Fat mass	-19.4 ***#	(2.2)	-11.0 ***#	(2.6)	-0.4	(1.5)	-15.8 ***#	(2.9)
% Lean mass	-3.9 **#	(0.5)	-1.0 #	(0.5)	+0.2	(0.4)	-2.1 *#	(0.6)
% BMC	-1.4*	(0.3)	-0.8	(0.3)	-0.1	(0.2)	-1.1 *#	(0.5)

different from C: # ANOVA P<0.05; different from baseline: t-tests ***P< 0.001

Loss of BMC correlated with loss of body weight and loss of fat in all interventions. BMC loss correlated with loss of lean in D only, where lean contributed 40% of weight loss. Subjects in E, with lesser weight loss, negligible lean loss but higher activity, showed significant correlation between BMC loss and activity. We concluded that in this study diet-induced weight loss was accompanied by BMC loss despite the introduction of exercise. Exercise-induced weight loss appeared to protect BMC but as weight loss was not of similar magnitude, further study, where this is achieved, is needed to define the relationship of exercise with diet in a long-term weight loss program.

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