

OSTEOSCOOP

News on current events in osteoporosis and rheumatology

Calorie restriction and bone health in young, overweight individuals

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Calorie restriction is promoted to increase longevity, yet this regimen could lead to bone loss and fracture, and therefore affect quality of life. In a recent study [1], 46 individuals were randomized to 4 groups for 6 months: (1) healthy diet (control group); (2) 25% calorie restriction from baseline energy requirements (CR group); (3) 25% energy deficit by a combination of CR and increased aerobic exercise (CR+EX group); and (4) low-calorie diet (890 kcal/d; goal, 15% weight loss) followed by weight maintenance (LCD group). Bone mineral density (total body and hip by dual-energy x-ray absorptiometry) and serum bone markers (bone specific alkaline phosphatase, osteocalcin, cross-linked C-telopeptide of type I collagen, and cross-linked N-telopeptide of type I collagen) were measured at baseline and after 6 months.

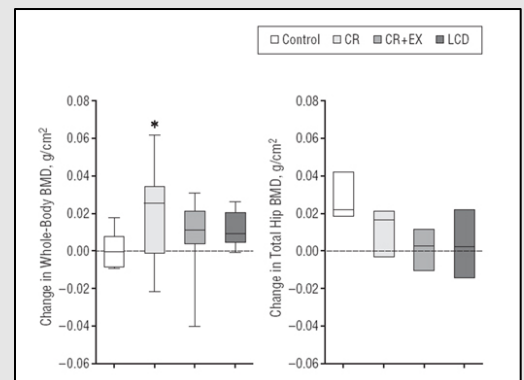
Body weight was reduced by $-1.0\% \pm 1.1\%$ (control), $-10.4\% \pm 0.9\%$ (CR), $-10.0\% \pm 0.8\%$ (CR+EX), and $-13.9\% \pm 0.7\%$ (LCD). Compared with the control group, none of the groups showed any change in bone mineral density for total body or hip. Bone resorption by serum cross-linked C-telopeptide of type I collagen was increased in all 3 intervention groups, with the largest change observed in the LCD group (CR, $23\% \pm 10\%$; CR+EX, $22\% \pm 9\%$; and LCD, $74\% \pm 16\%$ vs control, $4\% \pm 10\%$). Serum levels of cross-linked N-telopeptide of type I collagen were also increased in the LCD group. With regard to bone formation, bone alkaline phosphatase levels were decreased in the CR group ($-23\% \pm 10\%$) but were unchanged in the CR+EX, LCD, and control groups.

In conclusion, moderate calorie restriction, with or without exercise, which preserves calcium intake for 6 months leads to large changes in body composition without significant bone loss in young adults. Longer studies with assessments of bone architecture are needed to confirm that calorie restriction nutrient dense diets have no deleterious effect on bone health.

1. Redman LM et al. *Arch Intern Med.* 2008;168:1859-1866.

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