EFFECTS OF THE PHYTOESTROGEN GENISTEIN ON BONE METABOLISM IN OSTEOPENIC, POSTMENOPAUSAL WOMEN: A RANDOMIZED TRIAL

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Observational studies and small, short duration trials suggest that the isoflavone, phytoestrogen genistein reduces bone loss, but definitive evidence is unavailable. The aim of our study was to assess in a randomized, double-blind, placebo-controlled trial the effects of genistein administration on bone metabolism in osteopenic, postmenopausal women. We enrolled 389 postmenopausal women with a femoral neck bone mineral density <0.795 g/cm^2 and no significant co-morbid disease among those reporting to 3 medical centers. After a 4-week stabilization on low soy, fat-reduced diet, participants were randomly assigned to receive 54 mg of genistein daily for 24 months (n=198) or placebo (n=191). Both intervention and placebo contained calcium and vitamin D. The primary outcome was anteroposterior lumbar spine and femoral neck bone mineral density at 24 months. Secondary outcomes included bone-specific alkaline phosphatase, pyridinoline, deoxypyridinoline, insulin growth factor-1, and endometrial thickness. Data on adverse events were also collected. At the end of 24 months, the increase in bone mineral density was greater with genistein than with placebo [anteroposterior lumbar spine: genistein= +0.042 (95%CI, 0.032 to 0.053); placebo= -0.047 (95%CI, -0.063 to -0.031); P< 0.001. Femoral neck: genistein= +0.032 (95%CI, 0.022 to 0.042); placebo= -0.036 (95%CI, -0.045 to -0.026); P< 0.001]. Genistein significantly reduced the pyridinoline and deoxypyridinoline excretion, increased bone-specific alkaline phosphatase and insulin growth factor-1 levels and did not change endometrial thickness compared to placebo. Most treatment-related adverse events were a moderate number of gastrointestinal side effects [genistein n= 37 (18.69 %); placebo n= 15 (7.85%)]. After 24 months of treatment, genistein displays positive effects on bone mineral density in osteopenic, postmenopausal women.