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Vitamin K Treatment Reduces Undercarboxylated Osteocalcin But Does Not Alter Bone Turnover, Density or Geometry in Healthy Postmenopausal North American Women.

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Abstract Low vitamin K status is associated with low bone density and increased fracture risk. Additionally, a specific menaquinone, menatetrenone (MK4), may reduce fracture risk. However, whether vitamin K plays a role in the skeletal health of North American women remains unclear. Moreover, various K vitamers (e.g., phylloquinone and MK4) may have differing skeletal effects. The objective of this study was to evaluate the impact of phylloquinone or MK4 treatment on markers of skeletal turnover and bone density in non-osteoporotic, postmenopausal, North American women. In this double blind, placebo-controlled study, 381 postmenopausal women received phylloquinone (1 mg daily), MK4 (45 mg daily) or placebo for 12 months. All participants received daily calcium and vitamin D(3) supplementation. Serum bone specific alkaline phosphatase [BSAP] and n-telopeptide of type 1 collagen [NTx]) were measured at baseline, 1, 3, 6 and 12 months. Lumbar spine, proximal femur bone mineral density (BMD) and proximal femur geometry were measured by dual-energy x-ray absorptiometry at baseline, 6 and 12 months. At baseline, the three treatment groups did not differ in demographics or study endpoints. Compliance with calcium, phylloquinone and MK4 treatment was 93%, 93% and 87% respectively. Phylloquinone and MK4 treatment reduced serum undercarboxylated osteocalcin but did not alter BSAP or NTx. No effect of phylloquinone or MK4 on lumbar spine or proximal femur BMD or proximal femur geometric parameters was observed. This study does not support a role for vitamin K supplementation in osteoporosis prevention among healthy, postmenopausal, North American women receiving calcium and vitamin D supplementation.

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