

Abstract

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Vitamin K intake and osteocalcin levels in women with and without aortic atherosclerosis: a population-based study.

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OBJECTIVE: Protein-bound gamma-carboxyglutamate (Gla) has been demonstrated in calcified atherosclerotic plaques. Vitamin K is required for the formation of Gla-residues. As the biological activity of Gla-proteins appears to be strictly dependent on the presence of the Gla-residues, vitamin K status may be an important factor in the development and progression of atherosclerotic calcifications.

METHODS: We studied the association of vitamin K status, as assessed by nutritional vitamin K intake and the measurements of two circulating immunoreactive osteocalcin (irOC) fractions, with aortic atherosclerosis in a population-based study of 113 postmenopausal women.

RESULTS: Women with calcified lesions (n = 34) had a 42.9 micrograms lower mean age-adjusted dietary vitamin K intake/day (95% C.I. -6.6 to 92.5) than those without calcifications (n = 79). Atherosclerotic women had higher irOC levels with a low affinity for hydroxyapatite (irOCfree): age-adjusted difference of 0.32 ng/ml (95% C.I. 0.03 to 0.61). In addition, the high affinity irOC levels expressed as a percentage (hydroxyapatite binding capacity, HBC) were 5.12% (95% C.I. 1.32 to 8.92) lower in women with calcifications.

CONCLUSIONS: Our study indicates that women with aortic atherosclerosis have an impaired vitamin K status as reflected by a lower nutritional vitamin K intake, an increased irOCfree level and a reduced HBC level. An impaired vitamin K status in subjects with atherosclerosis is compatible with the view that vitamin K or Gla-containing proteins are involved in the development of calcification of the vessel wall.

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