

## Menaquinone-7 supplementation improves arterial stiffness in healthy postmenopausal women. A double-blind randomised clinical trial.

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#### Abstract

Observational data suggest a link between menaquinone (MK, vitamin K2) intake and cardiovascular (CV) health. However, MK intervention trials with vascular endpoints are lacking. We investigated long-term effects of MK-7 (180 µg MenaQ7/day) supplementation on arterial stiffness in a double-blind, placebo-controlled trial. Healthy postmenopausal women (n=244) received either placebo (n=124) or MK-7 (n=120) for three years. Indices of local carotid stiffness (intima-media thickness IMT, Diameter end-diastole and Distension) were measured by echotracking. Regional aortic stiffness (carotid-femoral and carotid-radial Pulse Wave Velocity, cfPWV and crPWV, respectively) was measured using mechanotransducers. Circulating desphospho-uncarboxylated matrix Gla-protein (dp-ucMGP) as well as acute phase markers Interleukin-6 (IL-6), high-sensitive C-reactive protein (hsCRP), tumour necrosis factor- $\alpha$  (TNF- $\alpha$ ) and markers for endothelial dysfunction Vascular Cell Adhesion Molecule (VCAM), E-selectin, and Advanced Glycation Endproducts (AGEs) were measured. At baseline dp-ucMGP was associated with IMT, Diameter, cfPWV and with the mean z-scores of acute phase markers (APMscore) and of markers for endothelial dysfunction (EDFscore). After three year MK-7 supplementation cfPWV and the Stiffness Index  $\beta$  significantly decreased in the total group, whereas distension, compliance, distensibility, Young's Modulus, and the local carotid PWV (cPWV) improved in women having a baseline Stiffness Index  $\beta$  above the median of 10.8. MK-7 decreased dp-ucMGP by 50 % compared to placebo, but did not influence the markers for acute phase and endothelial dysfunction. In conclusion, long-term use of MK-7 supplements improves arterial stiffness in healthy postmenopausal women, especially in women having a high arterial stiffness.

**KEYWORDS:** Arterial stiffness; Stiffness Index  $\beta$ ; carotid intima-media thickness; menaquinone-7; pulse wave velocity



**Publication types, MeSH terms, Substances**



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