

Vitamin K2 treatment reduces undercarboxylated osteocalcin by 69 % in the bone marrow

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BACKGROUND

- Clinical studies have suggested, that vitamin K2 prevents bone loss and protects against fractures
- Vitamin K2 is suggested to affect bone through the bone matrix protein osteocalcin (OC)
- OC is produced by the osteoblast in an undercarboxylated form (ucOC) that is carboxylated with vitamin K as a cofactor
- Carboxylated OC promotes mineralization of bone

AIM

- The aim of the study is to investigate the effects of vitamin K2 on bone metabolism
- In this substudy, the effect vitamin K2 for 3 months on bone formation markers in the bone marrow is investigated

DESIGN

Design

- A randomized double blinded placebo-controlled clinical trial

Participants

- 142 postmenopausal women (age 60-80 years) with osteopenia

Intervention

- Vitamin K2 (375 µg MK-7) or placebo
- Both groups: 38 µg vitamin D and 800 mg calcium

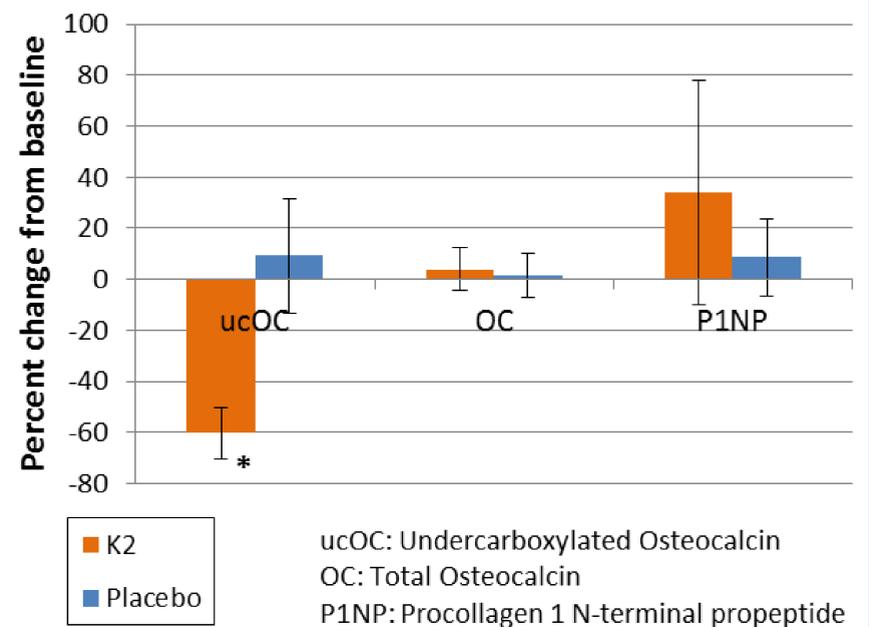
METHODS - BONE MARROW

- Bone marrow reflects the environment near the bone tissue
- 55 women at baseline and after 3 months
- Bone marrow serum analyzed for bone formation markers: OC, ucOC*, P1NP

* ucOC determined by ELISA test (Takara Shuzo Co., Japan)

RESULTS

Bone formation markers in bone marrow serum



	Δ K2	Δ Placebo	Between Groups
ucOC	-60.3±10.2 %*	9.1±22.3 %	-69.4±26.1 %*
OC total	4.0±8.6 %	1.5±8.5 %	2.5±12.2 %
P1NP	33.8±44.0 %	8.6±15.1 %	25.2±43.4 %

*p<0.05

CONCLUSION

- Treatment with vitamin K2 for 3 months reduced ucOC in the bone marrow, suggesting an increase in carboxylated OC
- The treatment did not change bone formation markers (totOC and P1NP)
- The results suggest that the effect of vitamin K2 is not mediated by stimulation of bone formation
- The effect may be through changes in the bone matrix

PERSPECTIVE

- DXA, HRpQCT and biochemical bone markers in blood serum after 1 year are currently being analysed.
- The study will provide new knowledge about the effects of vitamin K2, and the role of osteocalcin