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The effect of short-term phylloquinone supplementation on indices of vitamin K status and bone turnover in adult patients with Crohn's disease

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The circulating concentration of under- γ -carboxylated osteocalcin (ucOC), a sensitive marker of poor vitamin K nutritional status, has been shown to be higher in adult patients with Crohn's disease (CD) compared with age- and gender-matched healthy control subjects and is associated with increased rates of bone turnover^(1,2) and reduced bone mineral density⁽³⁾ in these patients. Supplementation with 1000 μ g phylloquinone/d has been shown to maximally suppress %ucOC in healthy adults⁽⁴⁾. However, with possible differences in efficiency of intestinal absorption of phylloquinone in adult patients with CD, it is not clear whether this supplemental level is adequate for maximal suppression of %ucOC in this group. Thus, the aim of the present study was to establish whether phylloquinone supplementation at 1000 μ g/d (or at the higher dose of 2000 μ g/d) was sufficient to maximize the γ -carboxylation status of serum osteocalcin in adult patients with CD. In addition, the effect of phylloquinone supplementation on markers of bone turnover was assessed in these patients.

Thirty adult patients with CD were randomised in a double-blind study to one of three treatment groups (placebo, 1000 μ g phylloquinone/d, 2000 μ g phylloquinone/d) for 2 weeks. Markers of vitamin K status (carboxylated osteocalcin and ucOC; from which %ucOC was calculated) and bone turnover (bone specific alkaline phosphatase and C-terminal telopeptide of type I collagen) were measured in fasting serum samples by ELISA. Repeated measures analysis was used to investigate the effect of phylloquinone intervention on indices of vitamin K status and bone turnover.

There were no significant differences in any of the biochemical indices of bone turnover or vitamin K status among the three treatment groups at baseline. Compared with patients who received placebo, serum %ucOC was significantly reduced in patients who received daily 1000 μ g or 2000 μ g phylloquinone for 2 weeks; with no significant difference between the latter two groups. There was no significant effect of phylloquinone treatment on markers of bone turnover.

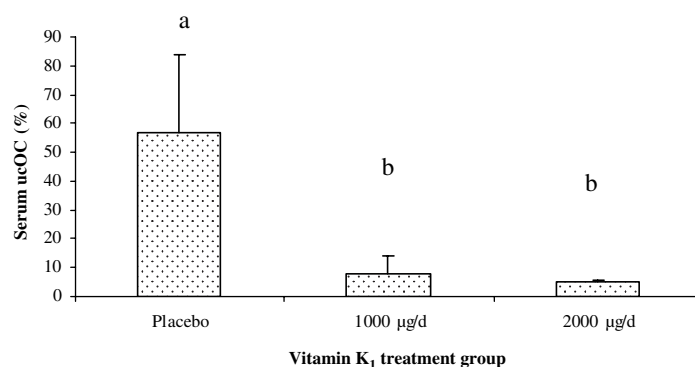


Figure. Values for serum %ucOC are means and standard deviations represented by vertical bars for ten patients. ^{a,b}Means with unlike superscript letters were significantly different ($P < 0.05$).

In conclusion, an intervention trial with 1000 μ g phylloquinone/d is needed to investigate whether suppression of %ucOC leads to beneficial changes in bone health indices in patients with CD.

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