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# Lowering homocysteine with B vitamins has no effect on biomarkers of bone turnover in older persons: a 2-y randomized controlled trial<sup>1,2,3</sup>

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**Background:** In recent prospective studies, higher homocysteine concentrations were shown to be a risk factor for osteoporotic fractures in older persons. Supplements containing folate and vitamins B-12 and B-6 lower homocysteine concentrations.

**Objective:** The objective of the study was to determine in healthy older persons whether lowering homocysteine with B vitamins affects plasma biomarkers of bone turnover.

**Design:** Healthy older persons ( $n = 276$ ; aged  $\geq 65$  y) were randomly assigned to receive either a daily supplement containing folate (1 mg), vitamin B-12 (500  $\mu\text{g}$ ), and vitamin B-6 (10 mg) or a placebo for 2 y. Of these participants, we selected 135 with baseline homocysteine concentrations  $>15.0 \mu\text{mol/L}$ , and we measured serum bone-specific alkaline phosphatase, a marker of bone formation, and bone-derived collagen fragments, a marker of bone resorption, at baseline and 2 y later.

**Results:** At 2 y, plasma homocysteine concentrations were  $5.2 \mu\text{mol/L}$  (95% CI: 3.9, 6.6  $\mu\text{mol/L}$ ;  $P < 0.001$ ) lower in the vitamin than in the placebo group. No significant differences were found in either serum bone-specific alkaline phosphatase ( $-0.3 \mu\text{g/L}$ ; 95% CI:  $-2.8, 2.1 \mu\text{g/L}$ ;  $P = 0.79$ ) or bone-derived collagen fragments ( $-0.0 \mu\text{g/L}$ ; 95% CI:  $-0.1, 0.1 \mu\text{g/L}$ ;  $P = 0.76$ ) between the vitamin and placebo groups, respectively, with 2 y of supplementation.

**Conclusion:** Supplementation with folate and vitamins B-6 and B-12 lowered plasma homocysteine but had no beneficial effect on bone turnover at the end of 2 y, as assessed by biomarkers of bone formation and resorption.

**Key Words:** Homocysteine • bone biomarkers • folate • vitamin B-12 • vitamin B-6 • clinical trial • older persons

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