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## Changes in basal and postmethionine load concentrations of total homocysteine and cystathionine after B vitamin intervention<sup>1-3</sup>

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### ABSTRACT

**Background:** Vitamin B-6 is necessary for the metabolism of homocysteine and is often used in combination with folic acid and vitamin B-12 in clinical trials that investigate whether the lowering of plasma total homocysteine (tHcy) can prevent vascular disease.

**Objective:** We compared the effects of vitamin B-6 with the effects of folic acid and vitamin B-12, as used in the Western Norway B-vitamin Intervention Trial (WENBIT), on basal and postmethionine load (PML) tHcy and cystathionine concentrations.

**Design:** Ninety patients with suspected coronary artery disease were randomly assigned to 1 of 4 groups to receive daily oral treatment with 1) 0.8 mg folic acid, 0.4 mg vitamin B-12, and 40 mg vitamin B-6 (group A); 2) 0.8 mg folic acid and 0.4 mg vitamin B-12 (group B); 3) 40 mg vitamin B-6 (group C); or 4) placebo (group D). For the first 2 wk, groups A and B received additional folic acid (5 mg/d). A methionine-loading test was performed at baseline and after 3 mo.

**Results:** Treatment with folic acid and vitamin B-12 caused a rapid and significant lowering of basal (31%) and PML tHcy concentrations (22%), with no effect on cystathionine. Vitamin B-6 did not change basal tHcy and had a significant but limited effect on PML tHcy concentrations. However, vitamin B-6 treatment markedly lowered basal and PML cystathionine by 31% and 42%, respectively.

**Conclusion:** The folic acid and vitamin B-12 combination applied in WENBIT provides rapid, substantial, and long-term tHcy-lowering effects, whereas the effect of vitamin B-6 on tHcy was relatively small and confined to PML tHcy. However, vitamin B-6 treatment caused a marked reduction in plasma cystathionine. Cystathionine could be a useful marker for assessment of the vitamin B-6 effect and should, together with tHcy, be related to clinical outcome in ongoing trials. *Am J Clin Nutr* 2004;80:641-8.

### KEY WORDS

Homocysteine, cystathionine, folate, vitamin B-6, vitamin B-12, vascular disease, methionine loading