

# Vitamin status and intake as primary determinants of homocysteinemia in an elderly population.

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# Vitamin Status and Intake as Primary Determinants of Homocysteinemia in an Elderly Population

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## Abstract

**Objective.** —To describe the distribution of plasma homocysteine concentrations in an elderly population and to analyze the relationship between homocysteine level and intake of vitamins and serum levels of vitamins that serve as coenzymes in homocysteine metabolism.

**Design.** —Cross-sectional analysis of homocysteine levels and vitamin blood levels and intake in elderly participants in the Framingham Study.

**Setting.** —Population-based cohort in Framingham, Mass.

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**Participants.** —A total of 1160 adult survivors, aged 67 to 96 years, from the original Framingham Heart Study cohort.

**Main Outcome Measures.** —Plasma homocysteine concentration correlated with plasma folate, vitamin B<sub>12</sub>, pyridoxal-5'-phosphate (PLP), and oral intakes of these vitamins, and the contribution of these vitamins to the prevalence of elevated homocysteine in the population.

**Results.** —Homocysteine levels were positively correlated with age after controlling for vitamin concentrations. After controlling for age, sex, and levels of other vitamins, homocysteine exhibited a strong inverse association with plasma folate. When subjects were grouped by deciles of plasma folate, mean homocysteine was significantly higher in the lowest two folate deciles (15.6 and 13.7  $\mu\text{mol/L}$ , respectively) than in the highest decile (11.0  $\mu\text{mol/L}$ ). Homocysteine demonstrated weaker, inverse associations with plasma vitamin B<sub>12</sub> and PLP. Similar inverse associations were demonstrated between homocysteine and intakes of folate and vitamin B<sub>6</sub>, but not vitamin B<sub>12</sub>. Prevalence of high homocysteine (>14  $\mu\text{mol/L}$ ) was 29.3% in this cohort, and was greatest among subjects with low folate status. Inadequate plasma concentrations of one or more B vitamins appear to contribute to 67% of the cases of high homocysteine.

**Conclusions.** —These results indicate a strong association between homocysteine concentration and folate, vitamin B<sub>12</sub>, and vitamin B<sub>6</sub> status, as well as age. It is possible that a substantial majority of the cases of high homocysteine in this older population can be attributed to vitamin status. (*JAMA*. 1993;270:2693-2698)

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