American Journal of Clinical Nutrition, Vol. 86, No. 4, 1073-1081, October 2007

ORIGINAL RESEARCH COMMUNICATION

The association between betaine and choline intakes and the plasma concentrations of homocysteine in women[1,2,3]

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Background: Elevated total homocysteine (tHcy), a risk factor for many chronic diseases, can be remethylated to methionine by folate. Alternatively, tHcy can be metabolized by other 1-carbon nutrients, ie, betaine and its precursor, choline.

Objective: We aimed to assess the association between the dietary intakes of betaine and choline and the concentration of tHcy.

Design: We conducted a cross-sectional analysis in 1477 women by using linear regression models to predict mean fasting tHcy by intakes of of betaine and choline.

Results: tHcy was 8% lower in the highest quintile of total betaine + choline intake than in the lowest quintile, even after control for folate intake (*P* for trend = 0.07). Neither choline nor betaine intake individually was significantly associated with tHcy. Choline from 2 choline-containing compounds, glycerophosphocholine and phosphocholine, was inversely associated with tHcy. These inverse associations were more pronounced in women with folate intake < 400 μg/d than in those with intakes ≥400 μg/d (*P* for interaction = 0.03 for phosphocholine) and in moderate alcohol drinkers (≥15 g/d) than in nondrinkers or light drinkers (<15 g/d) (*P* for interaction = 0.02 for glycerophosphocholine and 0.04 for phosphocholine). The strongest dose response was seen in women with a low-methyl diet (high alcohol and low folate intake) (*P* for interaction = 0.002 for glycerophosphocholine and 0.001 for phosphocholine).

Conclusions: Total choline + betaine intake was inversely associated with tHcy, as was choline from 2 water-soluble choline-containing compounds. Remethylation of tHcy may be more dependent on the betaine pathway when methyl sources are low as a result of either inadequate folate intake or heavier alcohol consumption.

Key Words: Betaine • choline • folate • homocysteine • alcohol • low-methyl diet

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