

Abstract

J Nutr Biochem. 2009 Jan; 20(1):62-69.

Choline status is not a reliable indicator of moderate changes in dietary choline consumption in premenopausal women

Christian M. Abrattea, Wei Wangb, Rui Lia, Juan Axumea, David J. Moriartyc, Marie A. Caudilld

BACKGROUND: For the prevention of liver dysfunction in women, a choline adequate intake of 425 mg/day was established. To date, the relationship between dietary choline intake and plasma concentrations of choline moieties remains relatively unexplored.

OBJECTIVE: As an extension of our previous work, this 14-week controlled feeding study investigated the relationship between moderate changes in dietary choline intake and blood indicators of status. The influences of folate intake and the methylenetetrahydrofolate reductase (MTHFR) C677T genotype were also considered.

METHODS: Healthy premenopausal women (n=45, 18–46 years) with the MTHFR 677CC (n=28) or TT (n=17) genotype consumed a folate-restricted diet for 2 weeks followed by randomization to one of four dietary treatments (n=6–9/group) differing in total choline (344–486 mg/day), betaine (122–349 mg/day) and/or folate (400–800 µg dietary folate equivalents/day) content for 12 weeks. Responses to treatment were assessed as changes in the plasma levels of choline moieties (i.e., betaine, choline, phosphatidylcholine and sphingomyelin) and/or leukocyte global DNA methylation between pretreatment (Week 2) and posttreatment (Week 14) values.

RESULTS: No significant changes were detected in the measured variables in response to dietary increases in choline (i.e., 41% increase) or betaine (i.e., 286% increase) intake. However, the MTHFR C677T genotype, alone or together with a diet, influenced betaine (P=.03) and phosphatidylcholine (P=.03).

CONCLUSION: These data suggest that choline status is not a reliable indicator of moderate changes in dietary choline intake possibly due to the engagement of compensatory mechanisms. In addition, the MTHFR C677T genotype appears to influence the direction and use of choline moieties in this group of women.

