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Effects of folic acid fortification and multivitamin therapy on homocysteine and vitamin b₁₂ status in cardiac transplant recipients

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Abstract

Background

Hyperhomocysteinemia is a frequent finding after cardiac transplantation, but increased folate intake induces a decrease in total homocysteine concentrations. In 1998, food in Canada was fortified nationwide with folic acid. We assessed the impact of routine folate fortification on homocysteine concentrations in our cardiac transplant population.

Methods

In 18 subjects, we measured total homocysteine (tHcy), serum folate, and cobalamin concentrations in 1997 (before folate fortification) and in 1998 (after fortification). We repeated the analysis after specific multivitamin supplementation for 10 weeks.

Results

We found a significant decrease in baseline tHcy concentrations and in folate concentrations between 1997 and 1998. However, we also found a decrease in serum cobalamin concentrations. We found a correlation between decreased cobalamin concentrations and the methionine synthase A2756G genotype, but not with other common polymorphisms associated with homocysteine metabolism. After multivitamin supplementation, we observed a trend toward further decrease in tHcy concentrations and a significant increase in serum folate and cobalamin concentrations. Finally, we measured serum methylmalonic acid concentrations, an index of tissue cobalamin status. We did not find a correlation between increased methylmalonic acid concentrations and decreased serum cobalamin, perhaps related to the confounding effect of altered renal status on methylmalonic acid excretion.

Conclusions

National folate fortification was associated with decreased tHcy and increased folate concentrations in our cardiac transplant population. Additional administration of vitamin supplements induced a further

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decrease in tHcy and an increase in tHcy. Finally, folic acid fortification unveiled cobalamin deficiency in some patients, associated with the methionine synthase A2756G mutation.

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