

Abstract

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The effects of vitamin supplementation and MTHFR (C677T) genotype on homocysteine-lowering and migraine disability.

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BACKGROUND: Migraine is a prevalent and debilitating disease that may, in part, arise because of disruption in neurovascular endothelia caused by elevated homocysteine. This study examined the homocysteine-lowering effects of vitamin supplementation on migraine disability, frequency and severity and whether MTHFR C677T genotype influenced treatment response.

METHODS: This was a randomized, double-blind placebo, controlled trial of 6 months of daily vitamin supplementation (i.e. 2 mg of folic acid, 25 mg vitamin B6, and 400 microg of vitamin B12) in 52 patients diagnosed with migraine with aura.

FINDINGS: Vitamin supplementation reduced homocysteine by 39% (approximately 4 $\mu\text{mol/l}$) compared with baseline, a reduction that was greater than placebo ($P=0.001$). Vitamin supplementation also reduced the prevalence of migraine disability from 60% at baseline to 30% after 6 months ($P=0.01$), whereas no reduction was observed for the placebo group ($P>0.1$). Headache frequency and pain severity were also reduced ($P<0.05$), whereas there was no reduction in the placebo group ($P>0.1$). In this patient group the treatment effect on both homocysteine levels and migraine disability was associated with MTHFR C677T genotype whereby carriers of the C allele experienced a greater response compared with TT genotypes ($P<0.05$).

INTERPRETATION: This study provides some early evidence that lowering homocysteine through vitamin supplementation reduces migraine disability in a subgroup of patients. Larger trials are now warranted to establish whether vitamin therapy is a safe, inexpensive and effective prophylactic option for treatment of migraine and whether efficacy is dependant on MTHFR C677T genotype.

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