

Abstract

Proc Nutr Soc. 2010 Feb;69(1):156-65.

Postgraduate Symposium: The MTHFR C677T polymorphism, B-vitamins and blood pressure.

Wilson CP, McNulty H, Scott JM, Strain JJ, Ward M.

Northern Ireland Centre for Food and Health, University of Ulster, Coleraine BT52 1SA, UK.

BACKGROUND: High blood pressure (BP) and elevated homocysteine are reported as independent risk factors for CVD and stroke in particular. The main genetic determinant of homocysteine concentrations is homozygosity (TT genotype) for the C677T polymorphism in the methylenetetrahydrofolate reductase (MTHFR) gene, typically found in approximately 10% of Western populations. The B-vitamins folate, vitamin B12 and vitamin B6 are the main nutritional determinants of homocysteine, with riboflavin more recently identified as a potent modulator specifically in individuals with the TT genotype.

RESULTS: Although observational studies have reported associations between homocysteine and BP, B-vitamin intervention studies have shown little or no BP response despite decreases in homocysteine. Such studies, however, have not considered the MTHFR C677T polymorphism, which has been shown to be associated with BP. It has been shown for the first time that riboflavin is an important determinant of BP specifically in individuals with the TT genotype. Research generally suggests that 24 h ambulatory BP monitoring provides a more accurate measure of BP than casual measurements and its use in future studies may also provide important insights into the relationship between the MTHFR polymorphism and BP. Further research is also required to investigate the association between specific B-vitamins and BP in individuals with different MTHFR genotypes in order to confirm whether any genetic predisposition to hypertension is correctable by B-vitamin intervention.

CONCLUSION: The present review will investigate the evidence linking the MTHFR C677T polymorphism to BP and the potential modulating role of B-vitamins.

PMID: 19954568