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MTHFR C677T AND MTR A2756G POLYMORPHISMS AND THE HOMOCYSTEINE LOWERING EFFICACY OF DIFFERENT DOSES OF FOLIC ACID IN HYPERTENSIVE CHINESE ADULTS

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Objectives This study aimed to investigate if the homocysteine-lowering efficacy of two commonly used physiological doses (0.4 mg/d and 0.8 mg/d) of folic acid (FA) can be modified by individual methylenetetrahydrofolate reductase (MTHFR) C677T and/or methionine synthase (MTR) A2756G polymorphisms in hypertensive Chinese adults

Methods A total of 480 subjects with mild or moderate essential hypertension were randomly assigned to three treatment groups: (1) enalapril only (10 mg, control group); (2) enalapril-FA tablet (10:0.4 mg (10 mg enalapril combined with 0.4 mg of FA), low FA group); and (3) enalapril-FA tablet (10:0.8 mg, high FA group), once daily for 8 weeks.

Results After 4 or 8 weeks of treatment, homocysteine concentrations were reduced across all genotypes and FA dosage groups, except in subjects with MTR 2756AG/GG genotype in the low FA group at week 4. However, compared to subjects with MTHFR 677CC genotype, homocysteine concentrations remained higher in subjects with CT or TT genotype in the low FA group ($p < 0.05$ for either of these genotypes) and TT genotype in the high FA group ($p < 0.05$). Furthermore, subjects with TT genotype showed a greater homocysteine-lowering response than did subjects with CC genotype in the high FA group (mean percent reduction of homocysteine at week 8: CC 10.8% vs TT: 22.0%, $p = 0.005$), but not in the low FA group (CC 9.9% vs TT 11.2%, $p = 0.989$).

Conclusions This study demonstrated that MTHFR C677T polymorphism can not only affect homocysteine concentration at baseline and post-FA treatment, but also can modify therapeutic responses to various dosages of FA supplementation.