

An MTHFR variant, homocysteine, and cardiovascular comorbidity in renal disease.

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Abstract

BACKGROUND: It is unclear whether total serum homocysteine (tHcy) and the C677T mutation of methylenetetrahydrofolate reductase (MTHFR) are associated with cardiovascular disease (CVD) in patients with end-stage renal disease (ESRD).

METHODS: A cross-sectional sample of 459 patients with ESRD on chronic dialysis was assessed to determine whether tHcy and the C677T mutation are associated with CVD prevalence in multiple logistic regression. As CVD mortality is high, we examined the relationship between homozygosity and duration of dialysis.

RESULTS: Mean tHcy was higher in patients without a history of CVD (35.2 micromol/L vs. 30.4 micromol/L, $P = 0.02$). In multivariate models, CVD was negatively associated with tHcy and positively associated with TT genotype, male gender, and body mass index. Mean tHcy levels were higher among those with the TT genotype compared with those with the CC genotype when adjusted for age, folate, creatinine, and albumin (37.9 micromol/L vs. 31.9 micromol/L, $P = 0.005$). Among whites, the prevalence of the TT genotype was higher in those having undergone less than one year of dialysis ($P = 0.002$).

CONCLUSIONS: The C677T genotype of MTHFR is associated with CVD in ESRD and may be a more meaningful marker than tHcy for abnormal homocysteine metabolism in ESRD. Prospective data from ongoing clinical trials are needed to improve our understanding of these findings. Screening for this polymorphism may help guide prevention measures.

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