The association between hyperhomocy steinemia and coronary artery disease in non-diabetic end-stage renal disease patients on regular hemodialysis

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Abstrak

Coronary artery disease (CAD) is an important cause of death in end-stage renal disease (ESRD) patients on regular hemodialysis. The high risk of CAD occurrence in ESRD patients is partially due to a high prevalence of established atherosclerotic risk factors, which are hypertension, diabetes and dyslipidemia. However, unique renal-related risk factors are also likely to contribute to this high risk of CAD. The high prevalence of hyperhomocysteinemia in ESRD patients is of interest because of the probable cardiovascular risk associated with the increase of total plasma homocysteine concentration. The aim of this study was to evaluate the role of homocysteine as a risk factor for CAD in non-diabetic ESRD patients on regular hemodialysis.

Total fasting plasma homocysteine, total cholesterol, LDL cholesterol, HDL cholesterol, triglyceride, hypertension and smoking habit were documented from 80 non-diabetic ESRD patients on regular hemodialysis (48 men, 32 women; mean age 54.5±6.5 years). Twenty-two (27.5%) among these patients suffered from CAD according to ECG and echocardiographic criteria. The risk of CAD was analyzed using a stepwise multiple logistic regression. Total fasting plasma homocysteine concentration and other risk factors for CAD were also determined in 80 age- and sex-matched normal controls.

Total fasting plasma homocysteine concentration was significantly higher in non-diabetic ESRD patients than in normal controls (26.0±1.5 versus 14.6±1.3 fimol/L; p<0.01). Hyperhomocysteinemia was observed in 92.5% ESRD patients. Homocysteine concentration was significantly higher in ESRD patients with CAD than without CAD (33.8±1.4 versus 23.5+1.5 umol/L; p<0.01). High total plasma homocysteine concentration and hypertension were independently associated with CAD in non-diabetic ESRD patients on regular hemodialeine concentration in the upper tertile (>30.6 jxmol/L) had an adjusted odds ratio of 2.95 (CI, 1.02 to 8.53; p<0.05). In ESRD patients, the intake of folic acid is the only factor associated with total plasma homocysteine concentration. The increase of total plasma homocysteine concentration in normal controls was associated with increased age and smoking habit.

This study concludes that a high total plasma homocysteine concentration is an independent risk factor for coronary artery disease in non-diabetic ESRD patients on regular hemodialysis.