THE INFLUENCE OF ESTIMATED GLOMERULAR FILTRATION RATE ON PLASMA HOMOCYSTEINE IN HYPERTENSIVE PATIENTS WITH NORMAL SERUM CREATININE

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BACKGROUND/AIM: To examine the relationship between estimated glomerular filtration rate (eGFR) and plasma total homocysteine (tHcy) in hypertensive patients with normal serum creatinine.

METHOD: A total of 137 hypertensive patients (mean age 66.6 y, 69 men) with serum creatinine level $\leq$ 1.5 mg/dL gave 10-h fasting blood samples for measurement of tHcy, serum folic acid, and serum vitamin B12. eGFR was estimated using the Cockroft-Gault formula.

RESULTS: Ninety-five patients fell into a chronic renal insufficiency (CRI) group (eGFR $\leq$60 mL/min/1.73 m^2) and 42 into a normal renal function (NRF) group (eGFR > 60 mL/min/1.73 m^2). The CRI group was older (72.1$\pm$7.1 vs. 54.2$\pm$13.4 y; p<0.001), had higher tHcy (11.4$\pm$3.9 vs. 8.7$\pm$2.3 μmole/L; p<0.001), higher serum urea nitrogen (17.8$\pm$4.4 vs. 14.7$\pm$3.7 mg/dL; p<0.001), higher serum creatinine (1.1$\pm$0.2 vs. 0.9$\pm$0.2 mg/dL; p<0.001), lower eGFR (47.8$\pm$7.6 vs. 74.9$\pm$13.9 mL/min/1.73 m^2; p<0.001), and lower diastolic blood pressure (77.6$\pm$6.1 vs. 83.0$\pm$8.6 mmHg; p=0.001) than patients in the NRF group. On univariate analysis, eGFR had the strongest correlation with tHcy (r=-0.453; p<0.001). Significant correlations, ranging in decreasing order from r=-0.418, p<0.001 to r=-0.170, p=0.047, were also noted between tHcy and serum vitamin B12, usage of fibrate, male sex, serum folic acid, age, smoking, presence of coronary artery disease, and five other variables. On multivariate analysis, only eGFR (p<0.001), usage of fibrate (p<0.001), serum level of vitamin B12 (p=0.002), serum level of folic acid (p=0.009), and smoking (p=0.027) were independent predictors of tHcy.

DISCUSSION/CONCLUSION: eGFR is a strong independent predictor of plasma homocysteine in hypertensive patients with normal serum creatinine.

Keywords: eGFR, folic acid, homocysteine, serum creatinine, serum B12