Cystatin C and the Risk for Cardiovascular Events in Patients with Asymptomatic Carotid Atherosclerosis

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Background
Renal dysfunction is a risk factor for cardiovascular events in patients with atherosclerosis. Cystatin C (CysC), a protein freely filtered by the renal glomerulus, reflects renal dysfunction independently of sex, weight, and race. We investigated whether baseline serum levels of CysC predict major cardiovascular events in patients with asymptomatic carotid atherosclerosis and compared the predictive value of CysC to established markers of renal function.

Methods
We prospectively studied 1004 of 1286 consecutive patients with carotid ultrasound scanning. Patients with prevalent atherosclerotic carotid artery disease at the time of enrollment were eligible. Patients with a cardiovascular event during the preceding 6 months were excluded.

Patients were followed for the occurrence of major cardiovascular events (MACE), a composite of myocardial infarction, percutaneous coronary intervention, coronary bypass graft, stroke, and death.

Results
During a median of 3 years follow-up (IQR 2.5 to 3.5), we recorded 346 MACE in 311 patients. Adjusted hazard ratios (HR) for a first MACE for increasing quintiles of CysC were 1.18 (95% CI, 0.77 to 1.8), 1.36 (95% CI, 0.89 to 2.08), 1.65 (95% CI, 1.11 to 2.47), and 1.94 (95% CI, 1.31 to 2.88), compared to the lowest quintile (p<0.001 for trend), respectively (Fig. 1, Fig. 2). Creatinine levels showed no significant association with major cardiovascular events (p=0.17 for trend; Fig. 2). For estimated glomerular filtration rate (eGFR), only the lowest quintile was moderately associated with adverse cardiovascular outcome (adjusted HR 1.58; 95% CI, 1.11. to 2.26), (p=0.31 for trend; Fig. 2).

Conclusion
CysC was significantly and gradually associated with future MACE in patients with carotid atherosclerosis. In contrast, serum creatinine or estimated glomerular filtration rate were not significant predictors of adverse cardiovascular outcomes.