Cardiac Troponin T and C-Reactive Protein for Predicting Prognosis, Coronary Atherosclerosis, and Cardiomyopathy in Patients Undergoing Long-term Hemodialysis

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Context Cardiac troponin T (cTnT) and C-reactive protein (CRP) are prognostic markers in acute coronary syndromes. However, for patients with end-stage renal disease (ESRD) the ability of combinations of these markers to predict outcomes, and their association with cardiac pathology, are unclear.

Objective To investigate the association between levels of cTnT and CRP and long-term risk of cardiac pathology and death in patients with ESRD.

Design, Setting, and Participants A prospective cohort study initiated February through June 1998 and enrolling 224 patients with ESRD from 5 hemodialysis centers in the Houston-Galveston region of Texas. Levels of cTnT and CRP were analyzed at study entry in patients without ischemic symptoms.

Main Outcome Measures All-cause mortality during a mean follow-up of 827 (range, 29-1327) days. Secondary outcomes in predefined substudies were coronary artery disease (CAD), decreased (≤40%) left ventricular ejection fraction (LVEF), and presence of left ventricular hypertrophy (LVH).
**Results**  One hundred seventeen (52%) patients died during follow-up. For levels of cTnT and CRP, progressively higher levels predicted increased risk of death compared with the lowest quartile (for cTnT quartile 2: unadjusted hazard ratio [HR], 2.2; 95% confidence interval [CI], 1.2-4.1; quartile 3: HR, 2.7; 95% CI, 1.5-4.9; quartile 4: HR, 3.0; 95% CI, 1.6-5.3. For CRP quartile 2: HR, 0.9; 95% CI, 0.5-1.6; quartile 3: HR, 1.8; 95% CI, 1.1-3.1; quartile 4: HR, 1.8; 95% CI, 1.1-3.2). Both cTnT and CRP remained independent predictors of death after adjusting for a number of potential confounders. The combination of cTnT and CRP results provided prognostic information when patients were divided into groups at or above and below the biomarker medians (high cTnT/high CRP levels vs low cTnT/low CRP levels for risk of death: HR, 2.5; 95% CI, 1.5-4.0). Elevated levels of cTnT, but not CRP, were strongly associated with diffuse CAD (n = 67; 0%, 25%, 50%, and 62% prevalence of multivessel CAD across progressive cTnT quartiles, *P* < .001). An LVEF of 40% or less was identified in 4 (9%), 3 (8%), 10 (27%), and 7 (19%) of patients across cTnT quartiles (*P* = .07). No trend for cTnT levels was found among patients with LVH (*P* = .45); similarly, no trend for CRP was found among patients with LVH (*P* = .65) or an LVEF of 40% or less (*P* = .75).

**Conclusions**  Among stable patients with ESRD, increasing levels of cTnT and CRP are associated with increased risk of death. Furthermore, higher levels of cTnT may identify patients with severe angiographic coronary disease.

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