Coronary Calcification Thought to Predict Mortality in Hemodialysis Patients

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May 16, 2008 — For people on hemodialysis, coronary artery calcification (CAC) appears to be an independent predictor of mortality, according to findings from one of the largest prospective studies ever conducted on this subject.

Among 598 dialysis patients followed for a mean of 18 months, the 62 (10.4%) who died had a higher mean CAC score than those who were still alive at the end of the study period ($P < .001$), Gulay Asci, MD, and colleagues from Ege University in Izmir, Turkey, reported these findings at the XLV European Renal Association-European Dialysis and Transplant Association Congress in Stockholm, Sweden.

Between September and November 2005, the patients underwent multislice computed tomography. One radiologist measured CAC for all the patients and assigned each a CAC score, based on the degree of calcification. The patients were divided into 4 groups: those with scores of 0 (27.7% of patients), those with scores between 1 and 100 (22.5%), those with scores between 101 and 400 (19.2%), and those with scores over 400 (30.6%). CAC score correlates with risk for coronary artery disease.

Patients who died during the follow-up period had a mean CAC score of 1343 and those still alive had a mean score of 525 ($P < .001$). Patients who died were significantly older, more likely to have diabetes, and had gained more weight during dialysis. They also had higher serum levels of C-reactive protein. The authors concluded that "CAC is an important independent predictor for all-cause mortality in hemodialysis patients."

However, at least 1 outside observer urged caution in interpreting these findings. "The reliability and validity of high-resolution computerized tomography (HRCT) in kidney failure has been questioned," Ell Friedman, MD, nephrologist and Distinguished Teaching Professor of Medicine at the State University of New York Downstate Medical Center in Brooklyn, told Medscape Nephrology. He cited a recent study by Barraclough et al (Nephrol Dial Transplant. Published online before print May 1, 2008) showing significant imprecision in HRCT-derived validation of coronary calcification in kidney failure patients, depending on who reads the results.

When 2 radiologists studied the same images, interreviewer agreement ranged from 77% to 94%, and 27% of patients had a substantive change in interpretation after repositioning. "Discovery of coronary artery calcification in dialysis patients is viewed as a mandate to discontinue inexpensive calcium-based phosphate binders in favor of expensive resins or lanthanum carbonate," said Dr. Friedman. "Accordingly, before proposing that therapy be redirected on the basis of a clinical trial, stringent assessment of the limitations of that trial are a must. It remains unproven that coronary artery calcification in itself imparts extra risk of death in dialysis patients."