From Heartwire

CAC Scoring Provides Prognostic Value on Top of Perfusion SPECT Imaging

Michael O'Riordan

August 6, 2009 (Munich, Germany) — Higher coronary artery calcium scores (CAC) and perfusion abnormalities at rest are both independent predictors of severe cardiac events during long-term follow-up of patients with stable coronary artery disease, research shows. Investigators also showed that the CAC score provided additional prognostic value over single photon emission computed tomographic (SPECT) myocardial perfusion abnormalities alone.

"CAC scoring may help to identify patients at particular risk for severe cardiac events, who may benefit from more comprehensive medical therapy and shorter follow-up intervals," according to lead investigator **Dr Christopher Uebleis** (University of Munich, Germany) and colleagues in the study published online July 31, 2009, in *Radiology*.

Dr Mario Garcia (Mount Sinai School of Medicine, New York), who was not part of the German study, told **heart*wire*** that most studies looking at the combined prognostic information obtained from perfusion imaging and the computed tomography (CT)-based calcium score have been in low-risk patients. In this series, patients were symptomatic and referred for SPECT.

"This suggests that if you can do both, you might be able to provide more meaningful information than you would from only SPECT alone," said Garcia. "I think it makes sense. Most of the prognostic data from coronary calcium score studies has been obtained from patients with lower risk, those without symptoms, so there are very few studies looking at these types of patients. But as a consumer, if I had to choose, I would rather have SPECT/CT than SPECT alone."

Previous studies, he said, have shown that CAC is important if the nuclear SPECT test is negative, but that nuclear perfusion imaging is more important than CAC when positive. He noted, however, that this study was small and did not enroll consecutive patients, thus limiting the widespread applicability of the findings.

Stable Coronary Artery Disease Population

In the study, Uebleis and colleagues enrolled 260 patients with stable coronary artery disease and obtained CAC scores and performed SPECT myocardial perfusion imaging at baseline. Patients were then stratified on the basis of CAC score ($\leq$ 400, > 400 but $\leq$ 1000, and > 1000) and on the basis of scintigraphic data obtained at rest and under stress.

Over a median period of 5.4 years, the patients were followed up for cardiac death or nonfatal myocardial infarction.

Patients with perfusion abnormalities at rest, those with a summed rest score (SRS) $\geq$ 2, were significantly more likely to have an event during follow-up when compared with those with a SRS < 2 (14.4% vs 4.4%, respectively). Similarly, those with a CAC score > 400 were also at significantly higher risk compared with those with less calcium (13.2% vs 5.8%, respectively). In multivariate analysis, a CAC score > 400 and a SRS $\geq$ 2, were the only independent predictors of event-free survival during follow-up.

When used in combination with SRS $\geq$ 2, a CAC score > 400 helped identify patients at the highest risk for severe cardiac events, report researchers.

Garcia said that the busier centers already have systems that include larger cameras that combine SPECT and CT capability, and while CT is primarily used for anatomic direction, this study suggests a benefit to CAC scoring in the stable coronary artery disease population.