Coronary imaging techniques helps to identify plaques likely to cause heart attacks

September 24 2009

Late-breaking results from the PROSPECT clinical trial shed new light on the types of vulnerable plaque that are most likely to cause sudden, unexpected adverse cardiac events, and on the ability to identify them through imaging techniques before they occur.

The trial, Providing Regional Observations to Study Predictors of Events in the Coronary Tree (PROSPECT), is the first prospective natural history study of atherosclerosis using multi-modality imaging to characterize the coronary tree. The study findings were reported at the 21st annual Transcatheter Cardiovascular Therapeutics (TCT) scientific symposium, sponsored by the Cardiovascular Research Foundation (CRF).

"As a result of the PROSPECT trial, we are closer to being able to predict—and therefore prevent - sudden, unexpected adverse cardiac events," said principal investigator Gregg W. Stone, MD, immediate past chairman of CRF, professor of medicine at Columbia University Hospital and Director of Cardiovascular Research and Education at the Center for Interventional Vascular Therapy at NewYork-Presbyterian Hospital/Columbia University Medical Center.

The multi-center trial studied 700 patients with acute coronary syndromes (ACS) using three-vessel multimodality intra-coronary imaging - angiography, intravascular ultrasound (IVUS), and virtual histology - to quantify the clinical event rate due to atherosclerotic progression and to identify those lesions that place patients at risk for

unexpected adverse cardiovascular events (sudden death, cardiac arrest, heart attacks and unstable or progressive angina).

Among the discoveries of the trial are that most untreated plaques that cause unexpected heart attacks are not mild lesions, as previously thought, but actually have a large plaque burden and a small lumen area. These are characteristics that were invisible to the coronary angiogram but easily identifiable by IVUS.

Only about half of new cardiac events due to non culprit lesions exemplified the classic notion of vulnerable plaque (rapid lesion progression of non flow limiting lesions), while half were attributable to unrecognized and untreated severe disease with minimal change over time. Perhaps most importantly, for the first time it was demonstrated that characterization of the underlying plaque composition (with virtual histology) was able to significantly improve the ability to predict future adverse events beyond other more standard imaging techniques.

"These results mean that using a combination of imaging modalities, including IVUS to identify lesions with a large plaque burden and/or small lumen area, and virtual histology to identify a large necrotic core without a visible cap (a thin cap fibroatheroma) identifies the lesions that are at especially high risk of causing future adverse cardiovascular events," Dr. Stone said.

Source: Cardiovascular Research Foundation