

## PAD patients have more extensive, calcified coronary artery disease

FEBRUARY 28, 2011 | [Michael O'Riordan](#)

**Cleveland, OH** – An analysis of trials using serial intravascular ultrasound (IVUS) imaging reveals that patients with peripheral artery disease (PAD) have more extensive coronary atherosclerosis and calcification than individuals without peripheral disease [1]. These patients also had experienced greater disease progression, had more impaired arterial remodeling, and had more cardiovascular events than those without PAD.

"We've been doing these IVUS studies for a number of years now, as standalone, to assess the various effects of different therapies," lead investigator **Dr Stephen Nicholls** (Cleveland Clinic, OH) told [heartwire](#). "This has allowed us an important opportunity to look at other fundamental questions, such as other diseases that are associated with a more progressive form of coronary artery disease. We know that PAD patients have a bad outcome, so we were intrigued to look at patients with coronary disease who also have PAD, and what we saw was that they actually do a lot worse. They have a lot more plaque, the artery remodels differently, and they have greater disease progression than individuals without PAD."

Nicholls said that patients with PAD have coronary-artery-disease progression similar to that of patients with uncontrolled type 2 diabetes, calling it a very aggressive form of disease. The good news, however, is that PAD patients respond well to therapy, particularly if their LDL-cholesterol levels are lowered to  $\leq 70$  mg/dL, he noted.

### Need to aggressively treat PAD patients

In the article, published in the March 8, 2011 issue of the *Journal of the American College of Cardiology*, the authors note that just 25% of PAD patients receive guideline-recommended therapies, despite the adverse cardiovascular outcomes among those with peripheral disease. In an attempt to determine whether the progression of coronary disease differed in PAD patients, the group analyzed data from seven IVUS trials—[REVERSAL](#), [CAMELOT](#), [ACTIVATE](#), [ASTEROID](#), [ILLUSTRATE](#), [PERISCOPE](#), and [STRADIVARIUS](#). Included in the analysis were 3479 CAD patients, including 216 with PAD and 3263 without peripheral disease.

Overall, the PAD patients had greater atheroma volume and more calcification in the images obtained by ultrasound. In addition, the PAD patients had significantly smaller lumen and vessel wall volumes. These smaller vessel wall volumes, coupled with similar total atheroma volumes, "suggest a trend toward more constrictive remodeling of the coronary arteries in PAD patients," according to the investigators. In the studies, PAD patients were more likely to die, have an MI, undergo revascularization, or have a stroke (26.3% vs 19.8%;  $p=0.03$ ).

On the other hand, aggressively reducing LDL-cholesterol levels to  $\leq 70$  mg/dL was associated with less progression of atherosclerosis as measured by percent atheroma volume and total atheroma volume on IVUS. PAD patients who achieved this low LDL-cholesterol target were significantly less likely to have progression of coronary artery disease, with 24.6% having disease progression compared with 39.6% of PAD patients who did not achieve the low LDL-cholesterol target. Similarly, significantly more patients with LDL-cholesterol levels  $\leq 70$  mg/dL were more likely to have coronary atherosclerosis disease regression compared with those who did not reach the low LDL-cholesterol levels.

The vessel biology data from these IVUS trials, said Nicholls, confirm the results observed in other studies showing that PAD patients have worse clinical outcomes than non-PAD patients, such as an increased risk of MI and cardiovascular death. While the reasons are unknown, it is speculated that the disease process in PAD patients might be more inflammatory or does more oxidative damage than in those without peripheral disease. In addition, PAD patients tend to have more risk factors associated with worse outcomes, in that they are more likely to smoke or have diabetes.

Overall, Nicholls said that PAD patients with and without coronary artery disease tend to be undertreated and in this way are not different from CAD patients with multiple risk factors or other comorbidities. Physicians, he said, need to recognize the need to aggressively treat multiple diseases in these patients.

*Nicholls receives honoraria from AstraZeneca, Merck, and Takeda Roche; is a consultant to Pfizer, AstraZeneca, Merck, Takeda, Anthera, and Novo Nordisk; and receives research support from AstraZeneca, Novartis, Resverlogix, Eli Lilly, and Anthera. Disclosures for the coauthors are listed in the paper.*

#### Source

1. Hussein AA, Uno K, Wolski K, et al. Peripheral arterial disease and progression of coronary atherosclerosis. *J Am Coll Cardiol* 2011; 57:1220-1225.

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