ATHEROSCLEROSIS

Regression of coronary atherosclerosis with statin therapy

Results from the IBIS-4 trial, an intracoronary imaging study that was designed to determine the effect of high-intensity statin therapy on atherosclerotic coronary arteries in patients with acute ST-segment elevation myocardial infarction (STEMI), were presented at the ESC Congress 2014 and simultaneously published in the *European Heart Journal*. High-dose statin therapy has been linked to reduced plaque burden in patients with nonobstructive coronary artery disease, but Dr Lorenz Räber, the lead investigator of IBIS-4, points out that before this study, “no data on the vascular response to high-dose statin therapy were available from STEMI patients”.

Investigators recruited 103 patients with STEMI who underwent baseline intravascular ultrasonography (IVUS) and radiofrequency ultrasonography (RF-IVUS) of the two noninfarct-related coronary arteries after percutaneous coronary intervention. Participants were

administered high-dose rosuvastatin (40 mg per day) for 13 months. At the end of follow-up, the participants underwent further imaging, and results were compared with baseline recordings.

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Despite having a smaller sample size than previous studies that examined the efficacy of high-dose statin therapy in patients with stable coronary artery disease, the IBIS-4 study demonstrated a significant reduction in plaque burden with high-dose statins. The primary end point of percent atheroma volume was significantly reduced by -0.90% after 13 months of high-dose statin therapy (95% CI -1.56 to -0.25% , $P=0.007$). HDL-cholesterol level increased from 1.1 mmol/l at baseline to 1.2 mmol/l at 13 months; this change coincided with

a reduction in LDL-cholesterol level from 3.3 mmol/l at baseline to 1.9 mmol/l at end of follow-up. Of note, 44% of patients achieved a guideline-recommended LDL-cholesterol level $\leq$ 1.8 mmol/l at 13 months.

Surprisingly, despite significant atheroma regression, no change was observed in percent necrotic core, as measured by RF-IVUS. Dr Räber argues that “a reduction in necrotic core might be difficult to achieve within 13 months” and notes that “the absence of change can also be viewed as a lack of progression.” Further, he emphasizes the need for “more sophisticated methods with even better validation to detect statin-mediated changes of atherosclerosis.”

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Original article Räber, L. *et al.* Effect of high-intensity statin therapy on atherosclerosis in non-infarct-related coronary arteries (IBIS-4): a serial intravascular ultrasonography study. *Eur. Heart J.* doi:10.1093/eurheartj/ehu373