

Intensive Statin Therapy May Partially Reverse Plaque Build-Up in Arteries

The ASTEROID study (A Study To Evaluate the Effect of Rosuvastatin on Intravascular Ultrasound-Derived Coronary Atheroma Burden [ASTEROID] Trial) demonstrated, for the first time, that very intensive cholesterol lowering with a statin drug can partially reverse the buildup of plaque in the coronary arteries. This finding has never before been observed in a study using statin drugs, the most commonly used cholesterol lowering treatment. Previous research had indicated that intensive statin therapy could prevent the progression of coronary atherosclerosis, or arterial plaque build-up, but not actually reduce disease burden.

The trial was conducted at 53 community and tertiary care centers in the United States, Canada, Europe, and Australia. A total of 507 patients had baseline intravascular ultrasound (IVUS) examination and received 40 mg daily of rosuvastatin. Intravascular ultrasound (IVUS) provides a precise and reproducible method for determining change in plaque, or atheroma, burden during treatment. Atherosclerosis progression was assessed at baseline and after 24 months of treatment.

The intense statin therapy used in this study resulted in significant regression of atherosclerosis as measured by IVUS, a technique in which a tiny ultrasound probe is inserted into the coronary arteries to quantify plaque. The study showed that therapy resulted in regression occurred for all three pre-specified IVUS measures of disease burden. The mean baseline LDL cholesterol of 130.4 mg/dL decreased to

60.8 mg/dL in the study patients, a reduction of 53.2 percent. This is the largest reduction in cholesterol ever observed in a major statin outcome trial. Mean HDL cholesterol (43.1 mg/dL at baseline) increased to 49.0 mg/dL, a 14.7 percent increase, which was also unprecedented. The arterial plaque burden was reduced by 6.8 to 9.1% for the various measures of disease burden.

“Previous similar studies with statins have shown slowing of coronary disease, but not regression. This regimen significantly lowered bad cholesterol, and surprisingly, markedly increased good cholesterol levels,” said Steven Nissen, M.D., F.A.C.C., of the Cleveland Clinic and lead author of the study. Dr. Nissen is also President-Elect of the American College of Cardiology. “We conclude that very low LDL levels (below current guidelines), when accompanied by raised HDL, can regress, or partially reverse, the plaque buildup in the coronary arteries.”

Further clinical follow-up will be needed to determine the hard endpoints and outcomes of such aggressive lipid reduction therapy and whether plaque volume reduction by IVUS translates into lower number of major cardiovascular events. In addition, further analysis of plaque composition and the pleiotropic effects of rosuvastatin might give further insight into its ability to reduce plaque volume. Comparison with other lipid lowering agents as well as correlation of degree lipid lowering with the degree of plaque reduction should be investigated in the future to corroborate these results.

	Lipid Results (mean values)		
	Baseline	During Treatment	% Change*
Total cholesterol (mg/dL)	204	133.8	-33.8
LDL-cholesterol (mg/dL)	130.4	60.8	-53.2
HDL-cholesterol (mg/dL)	43.1	49.0	+14.7
Triglycerides (mg/dL)	152.2	121.2	-14.5
LDL-cholesterol/HDL-3.2 cholesterol ratio*	1.3	-58.5	

P < .001 for all comparisons between baseline and during treatment.

	Primary and Secondary Efficacy Parameters (median values)				
	Baseline	Follow-up	Change	% Change	% With Regression
Percent atheroma volume	39.9	38.5	-0.79	NA	63.6
Atheroma volume in most diseased 10-mm subsegment (mm ³)	65.1	58.4	-5.6	-9.1	78.1
Normalized total atheroma volume (mm ³)	204.7	186.8	-12.5	-6.8	77.9

NA = not applicable