Effect of Atorvastatin on sdLDL in patients after coronary bypass surgery

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Background and Aim: Small-Dense Low-Density Lipoprotein Cholesterol (sdLDL) particles are considered a risk factor for coronary heart disease. The aim of this study was to investigate whether treatment with atorvastatin changes LDL particles into larger, less atherogenic forms.

Methods: Eighty patients who had undergone coronary artery bypass surgery (CABG) at least 3 months before inclusion were randomised to 80 mg atorvastatin or matching placebo daily for 6 weeks followed by the opposite treatment for another 6 weeks (cross-over design). Fasting blood samples were analysed at baseline and after each treatment period. LDL cholesterol was analysed by standard methods, and sdLDL was determined using iodixanol gradient ultracentrifugation. Statistics were done using a mixed effect linear regression model.

Results: The mean sdLDL % of total LDL at baseline was 51.2, after placebo 53.1 and after atorvastatin 53.0. The mean difference between treatments was 0.2 (p=0.85). Adjustment for age, gender and former use of statins did not alter the results. LDL cholesterol decreased by 61% after atorvastatin treatment (<0.001).

Conclusion: Treatment of CABG patients with atorvastatin 80 mg/day for 6 weeks significantly reduced LDL cholesterol but did not reduce the percentage of sdLDL particles.