IMPACT OF LIPOPROTEIN REMNANTS ON 12 YEAR RISK FOR CHD IN THE FRAMINGHAM OFFSPRING POPULATION

Poster Contributions
Poster Sessions, Expo North
Saturday, March 09, 2013, 3:45 p.m.-4:30 p.m.

Session Title: Prevention: Lipoproteins, Particles and Ratios
Abstract Category: 24. Prevention: Clinical
Presentation Number: 1145-4

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Introduction: Remnants represent incompletely hydrolyzed, triglyceride enriched lipoproteins such as very low-density lipoprotein fraction 3 (VLDL3) and intermediate-density lipoprotein (IDL) and are believed to be atherogenic.

Hypothesis: In the Framingham Offspring Study (FOS), remnant lipoproteins are associated with increased risk for incident CHD (inclusive of coronary death, MI, coronary insufficiency, and angina pectoris).

Methods: Vertical auto profile measurements were performed on 819 men and women without prevalent cardiovascular disease. The relationship between VLDL3, IDL, and the sum of VLDL3 + IDL (total remnants) and 12-year risk for CHD was examined using multivariable Cox proportional hazard regression for two models adjusted for Framingham risk factors (model 1 adjusts for age, sex, systolic blood pressure and use of antihypertensives, prevalent diabetes, and smoking; model 2 adjusts for model 1 risk factors, HDL-C, and TC).

Results: In model 1, VLDL3 (HR 1.43; 95% CI 1.12-1.82, p<0.004), IDL (HR 1.39; 95% CI 1.07-1.80, p<0.014), and total remnants (HR 1.43; 95% CI 1.11-1.85, p<0.032) were all significant predictors of incident CHD. In model 2, VLDL3 lost significance (HR 1.30; 95% CI 0.96-1.75, p<0.089), but IDL (HR 1.39; 95% CI 1.03-1.82, p<0.03) and total remnants (HR 1.37; 95% CI 1.03-1.84, p<0.032) remained significant predictors for incident CHD. Non-HDL-C which broadly includes all atherogenic lipoproteins including remnants was significant in both model 1 ((HR 1.42; 95% CI 1.09-1.83, p<0.008) and model 2 (HR 1.46; 95% CI 1.02-2.08, p<0.037).

Conclusions: In this exploratory analysis, after controlling for Framingham risk factors in men and women, remnant lipoproteins are independent risk factors for incident CHD events over 12 years of follow-up in the FOS, though VLDL3 lost significance after controlling for all Framingham covariates.