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VASCULAR DISEASE

PROGRESSION OF ATHEROSCLEROSIS IN AN ASYMPTOMATIC POPULATION - EFFECT OF LIPID SUBCLASS

ACC Poster Contributions

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Background: LDL, HDL, and VLDL are associated with progression of atherosclerosis (PA) in different vascular beds. However the effect of lipid subclasses (LSC) in PA is unknown.

Methods: Multi-Ethnic study of Atherosclerosis (MESA) is a population based study (n=6,814) of varied ethnicities, aged 45-84 years, with no cardiovascular disease (CVD). This is a post-hoc analysis of the MESA NHLBI Limited Access Dataset of cohort with data on LSC, follow up coronary artery calcium (CAC) score (n=5455) and ankle-brachial index (ABI) (n=5659). All LSC (as measured by nuclear magnetic resonance) were analyzed. CAC and ABI progression was investigated as a categorical variable using previously published methodology (refer figure). Multivariate regression was used to adjust for known risk factors, LSC and lipid lowering therapy use at baseline.

Results: Mean CAC score 135 ± 381 Agatston units, mean ABI 1.1 ± 0.1 , mean VLDL size 51 ± 8.8 nm and mean medium sized VLDL (m-VLDL) was 31.2 ± 23.6 nmol/L. During 2.4 years of follow-up 1978 (35%) had progression of CAC and 374 (7%) had decline in ABI. In the multivariate model (HR, 95% CI, p value), elevated m-VLDL concentration (1.07, 1.03-1.11, 0.001) was associated with CAC progression. m-VLDL concentration (1.08, 1.03-1.12, 0.007) also predicted hard end points (CVD). However for ABI drop, a higher mean VLDL size was protective (0.98, 0.97-0.99, 0.02).

Conclusion: VLDL sub fractions are more powerful predictors for progression of atherosclerosis than LDL and HDL.

End-Points	Variable	Hazard Ratio	95% C.I	P value
ABI drop	Mean VLDL size	0.98	0.97-0.99	0.02
CAC progression	m-VLDL	1.07	1.03-1.11	0.001
CVD	m-VLDL	1.08	1.03-1.12	0.007

ABI drop defined as drop in ankle-brachial index > 0.15 . CAC progression defined as coronary calcium score (CAC) > 0 for those with initial CAC = 0, CAC score increase per year > 10 agatston units if initial CAC = 0 $< \text{CAC} < 100$ and $> 10\%$ increase per year in CAC score for those with CAC > 100 at baseline.

CVD: Includes cardiovascular death, Myocardial Infarction, stroke, Angina, Transient Ischemic Attack.

m-VLDL: medium sized VLDL concentration.