The Association Between Serum LDL level and the Presence of Non-Calcified Coronary Artery Plaque in Young Adults

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BACKGROUND

Previous studies have shown that lipid-lowering therapy, particularly statins, reduce the overall risk of death due to cardiovascular disease in previously event-free population. But the association between the serum lipid composition and the several types of coronary plaques has not been established, especially in young adults with Coronary artery disease (CAD).

METHODS

In this prospective observational study, we enrolled a total of 182 asymptomatic, young individuals with cardiovascular risk factors, ranging between 25 and 40 years of age, to establish the prevalence of coronary atherosclerosis by contrast cardiac CT. A total of 73 subjects of the overall study population were found to have coronary atherosclerosis. Plaque volume was calculated in each diseased segment by low radiation protocol CT angiography and using semi-automated quantitative plaque measurement software. Multivariate regression analysis was used to evaluate the association between lipid sub-classes and plaque burden from both crude and models with adjustment for covariates including age, gender, race, hypertension, smoking, diabetes and diabetes duration.

RESULTS

73 subjects (40.6%) of the study population had a coronary plaque. A significant association was observed between low density lipoprotein (LDL) >77.0 mg/dL and the presence of non-calcified plaque including low-attenuation plaque (β (se) 1.0(0.0), 95% CI 0.0 to 0.2; P= 0.007) and fibro-fatty plaque with (β (se) 0.3(0.1), 95% CI 0.1 to 0.5; P= 0.008).

CONCLUSIONS

Additional evaluation of the coronary arteries should be considered in the young individuals with high LDL. This subgroup of adults may require statin therapy to prevent the long-term cardiovascular-related events. A detailed plaque evaluation by CTA may help guide lipid-lowering therapies for young individuals at risk of CAD.

DISCLOSURE INFORMATION

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Coronary Artery Disease (CAD) is not rare in young individuals.

LDL value can be a valuable factor in the screening for early CAD in asymptomatic young individuals.

There is a significant correlation between higher LDL and low-attenuation and fibro-fatty coronary plaques in asymptomatic young adults

LDL more than 77.0 mg/dl could independently predict the presence of subclinical atherosclerotic coronary plaques in low-risk CAD

Additional evaluation of the coronary arteries should be considered in the young individuals with high LDL