Low HDL-C predicts Subclinical Atherosclerosis in Asymptomatic South East Asian Patients without known Cardiovascular Disease

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Summary

We assessed the association between low HDL-C and subclinical atherosclerosis in asymptomatic individuals without known cardiovascular (CV) disease. 276 patients underwent B-Mode carotid ultrasound. Mean carotid artery intima-media thickness (CIMT) was measured. Subclinical atherosclerosis was defined as a mean CIMT > 1.0mm. In a logistic regression analysis, HDL-C (OR = 0.94; 95% CI = 0.90 to 0.98; p < 0.01) was an independent predictor of subclinical atherosclerosis, as were age (OR = 1.06; 95% CI = 1.01 to 1.11; p = 0.01) and SBP (OR = 1.03; 95% CI = 1.00 to 1.06; p = 0.02). For every 1mg/dl decrease in HDL-C, the risk of developing subclinical atherosclerosis increased by 6%. In an asymptomatic South East Asian population, a low HDL-C was the only lipid parameter associated with development of subclinical atherosclerosis.

Introduction

Epidemiologic studies have shown a strong inverse association between HDL-C and CV events (1 - 2). Low HDL-C is becoming increasingly common in South East Asian populations, most likely due to the increasing prevalence of Type II diabetes and metabolic syndrome (3). Presence of subclinical atherosclerosis in asymptomatic patients has been shown to be associated with a 25 to 30% increased risk of myocardial infarction and stroke (4).

We assessed the association between low HDL-C and subclinical atherosclerosis in asymptomatic individuals without known CV disease.
Materials and Methods

Study Population

This was a single centre prospective study conducted at Novena Heart Centre, an outpatient based cardiology private practice. Between November 2007 to January 2009, 276 consecutive asymptomatic statin-naive patients were recruited. Patients with known atherosclerotic vascular disease (ischemic heart disease, cerebrovascular disease or peripheral vascular disease). Demographic data was collected, B-Mode carotid ultrasound of both carotid arteries were performed and Framingham risk score (FRS) was calculated in all study patients.

Carotid Ultrasound Protocol

All studies were performed using the Esaote MyLab30Gold Cardiovascular ultrasound machine (Esaote S.p.A., Florence, Italy). CIMT measurements were obtained online from the distal 1cm of the far wall of each common carotid artery using an automated edge detection software (QIMT) and reported as the average value for both arteries. Subclinical atherosclerosis was defined as a mean CIMT ≥ 1.0mm (5).

Statistical Analysis

Results were expressed as mean ± standard deviation. Differences between conti-
nuous variables were determined using the Mann-Whitney-U or Kruskal-Wallis test. Associations between categorical variables were assessed using Chi-square or Fisher’s Exact tests. Multiple logistic regression was performed to identify the independent predictors of subclinical atherosclerosis. Statistical analysis was performed using the statistical package SPPS for Windows (Release 13.0 SPSS Inc, Chicago, IL). Statistical significance was defined as a two tailed p value of <0.05.

Results

276 individuals (61% male, 39% female), age 50.7 (10.5) years underwent B-Mode carotid ultrasound of both carotid arteries. A comparison of the demographic variables between patients with and without subclinical atherosclerosis is shown in Table 1. Compared to patients without subclinical atherosclerosis, those with subclinical atherosclerosis had higher systolic BP (147mmHg vs 133 mmHg), higher FRS (13% vs 6%), higher TC/HDL-C ratio (4.8 vs 4.3), lower HDL-C (46mg/dl vs 55 mg/dl), were older (56yrs vs 50yrs), were more likely to have family history of premature CV disease (80% vs 30%) and were more likely to be smokers (28% vs 12%)(all p <0.05). The carotid ultrasound of a patient with low HDL-C and subclinical atherosclerosis is shown in Figure 1. The univariate and multivariate predictors of subclinical atherosclerosis is shown in Table 2. In a logistic regression analysis, HDL-C (OR = 0.94; 95% CI = 0.90 to 0.98; p < 0.01) was an independent predictor of subclinical atherosclerosis, as were age (OR = 1.06; 95% CI = 1.01 to 1.11; p = 0.01) and SBP (OR = 1.03; 95% CI = 1.00 to 1.06; p = 0.02)(Table 2). For every 1mg/dl decrease in HDL-C, the risk of developing subclinical atherosclerosis increased by 6%. 
Conclusions

Our study demonstrates that in an asymptomatic South East Asian popula-
tion, a low HDL-C was the only lipid parameter associated with development of subclinical atherosclerosis, consistent with the results of a previous study (6). In that study which recruited a cohort with familial hypercholesterolemia, HDL-C was a stronger predictor of subclinical atherosclerosis than LDL-C. Specific treatment to raise HDL-C levels may contribute to reducing the significant residual CV risk that exists in spite of the availability of highly effective therapies for lowering LDL-C.

References


