Fasting Serum Apolipoprotein (apo)B-48 Levels Were Correlated with the Prevalence of Coronary Artery Disease


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Background

Many clinical studies have shown that fasting hypertriglyceridemia and postprandial hypertriglyceridemia (PH) are both closely related to the development of atherosclerotic cardiovascular diseases (1, 2). PH is characterized by postprandial accumulation of TG-rich lipoproteins (TRLs) and their partially hydrolyzed products, “remnant lipoproteins,” as suggested by Zivelin et al. (3) and supported by numerous subsequent studies (4, 5).

Remnant lipoprotein cholesterol levels are closely correlated with the prevalence of coronary artery disease (CAD) (6, 7).

The remnant lipoprotein remnant lipoproteins has been the subject of numerous studies, however, the atherogenicity of chylomicron remnants (CM-R) has been investigated less frequently than that of VLDL remnants (VLDL-R) or of CM-R.

CM-R are profoundly produced in the postprandial state, which is observed in patients with type III hyperlipidemia whose serum was rich in remnant lipoproteins after the dinner meal (8).

C. Fasting apo-B48 levels are correlated with carotid IMT in subjects with normal serum TG levels (Fasting apo-B48: 25 μg/ml).

Purpose

To assess whether the accumulation of CM-R was correlated with the development of CAD by measuring fasting apo-B48 levels.

Methods

Study Subjects

A consecutive series of suspected cases of CAD were hospitalized in Osaka University Hospital and National Hospital Organization Kure Medical Center from Jan. 2002 to Dec. 2003.

After the elimination of patients who needed emergency care, had acute coronary syndrome or were already being treated with lipid-lowering drugs (189 subjects), CAD patients and non-CAD subjects were collected.

CAD patients (n=96, m; f=71:25), those who had significant coronary stenosis by CAG (75% or more luminal diameter narrowing) or who underwent CABG (79 subjects).

non-CAD subjects (n=67, m: f=49:18), age-, sex-, and BMI-matched subjects who did not have significant stenosis

Measurements

• Height, weight, BMI, blood pressure (BP, in a supine position)
• Fasting-lipid levels were measured:
  - Total cholesterol (TC) and TG levels by enzymatic methods, LDL-C and HDL-C levels by the direct method (Seikoh Medical Co., Ltd., Tokyo, Japan)
  - Plasma adiponectin levels by ELISA (Osaka Pharmaceuticals, Tokyo, Japan)
  - Fasting plasma glucose (FPG) by the enzymatic method, and HbA1c by ion-exchange HPLC (Seikoh Medical Co., Ltd., Tokyo, Japan)
  - Serum apo-B48 levels by CLEIA system (Fujiﬁn Inc., Tokyo, Japan)
- Diagnosis of metabolic disorders
  - Hypertension: systolic BP≥135 mmHg and/or diastolic BP≥85 mmHg (13) or by intake of anti-hypertensive drugs
  - Dyslipidemia: LDL-C≥4.0 mmol/l, TG≥5.0 mmol/l and/or HDL-C<0.8 mmol/l (14)
  - High Fasting Glucose: FPG ≥126 mg/dl (Japanese Diabetes Society) or by intake of anti-diabetic drugs
  - MetS: according to the criteria of the Japanese Society of Internal Medicine (13) and USA (NCEP-ATPIII) (16)

Statistical Analyses

The statistical significance of differences in metabolic parameters and percentages of metabolic disorders between CAD patients and non-CAD subjects was determined by Mann-Whitney U test (Apo B-48, BMI and adiponectin levels were normalized by logarithmic transformation), the prevalence of MTS by chi-square test

The correlations between metabolic parameters and CAD were analyzed by Pearson’s correlation coefficients, stepwise multiple logistic regression analysis was used to determine independent predictors of CAD (exploratory variables: age, sex, Log-BMI, smoking, TC, LDL-C, Apo-B48, TG, HDL-C, BMI, diastolic BP, FPG, HbA1c, Log-apo-B48 and Log-adiponectin).

Conclusion

High fasting serum apo-B48 level correlates the prevalence of CAD. The prevalence of CAD significantly was significantly higher in patients with high apo-B48 levels when their metabolic parameters of the metabolic syndrome were impaired.

References