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Lipid discordance and carotid plaque in obese patients in primary prevention☆

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KEYWORDS
Obesity;
Lipid discordance;
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Abstract
Introduction: Obese patients with lipid discordance (non-HDL cholesterol levels 30 mg/dl above the LDL-c value) may have a greater prevalence of carotid atherosclerotic plaque (CAP). Our study objectives were: (1) To assess the prevalence of lipid discordance in a primary prevention population of obese patients; (2) To investigate the association between lipid discordance and presence of CAP.
Methods: Obese subjects aged >18 years (BMI $\geq$ 30 kg/m^2) with no cardiovascular disease, diabetes, or lipid-lowering treatment from six cardiology centers were included. Lipid discordance was defined when, regardless of the LDL-c level, the non-HDL cholesterol value exceeded the LDL-c value by 30 mg/dl. Presence of CAP was identified by ultrasonography. Univariate and multivariate analyses were performed to explore the association between lipid discordance and presence of CAP.
Results: The study simple consisted of 325 obese patients (57.2% men; mean age, 52.3 years). Prevalence of lipid discordance was 57.9%. CAP was found in 38.6% of patients, but the proportion was higher in subjects with lipid discordance as compared to those without this lipid pattern (44.4% vs. 30.7%, $p = 0.01$). In both the univariate (OR: 1.80; 95% CI: 1.14–2.87; $p = 0.01$) and the multivariate analysis (OR: 2.07; 95% CI: 1.22–3.54; $p = 0.007$), presence of lipid discordance was associated to an increased probability of CAP.
Conclusion: In these obese patients, lipid discordance was associated to greater prevalence of CAP. Evaluation of obese patients with this strategy could help identify subjects with higher residual cardiovascular risk.

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PALABRAS CLAVE
Obesidad;
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Discordancia lipídica y placa carotídea en pacientes obesos en prevención primaria

Resumen
Introducción: Los pacientes obesos con discordancia lipídica podrían tener una mayor prevalencia de aterosclerosis subclínica. Los objetivos de nuestro trabajo fueron: 1) determinar la prevalencia de discordancia lipídica en una población de pacientes obesos en prevención primaria; 2) investigar la asociación entre la discordancia lipídica y la presencia de placa aterosclerótica carotídea (PAC).
Métodos: Se incluyeron sujetos mayores de 18 años obesos (índice de masa corporal $\geq 30\,kg/m^2$) sin enfermedad cardiovascular, diabetes, o tratamiento hipolipemiante, provenientes de 6 centros de cardiología. Se definió «discordancia lipídica» cuando, independientemente del valor de c-LDL, el valor de colesterol no HDL superaba 30 mg/dL el valor de c-LDL. Se identificó la presencia de PAC por ultrasonido. Se realizaron análisis uni y multivariados explorando la asociación entre la discordancia lipídica y la presencia de PAC.
Resultados: Se incluyeron 325 pacientes obesos (57,2% hombres, edad media: 52,3 años). La prevalencia de discordancia lipídica fue del 57,9%. Mostraron PAC el 38,6% de los pacientes. Esta proporción fue mayor en los sujetos con discordancia lipídica en comparación con los pacientes sin este patrón lipídico (44,4% vs. 30,7%, p = 0,01). En el análisis univariado (OR: 1,80; IC95%: 1,14-2,87; p = 0,01) y en el multivariado (OR: 2,07; IC95%: 1,22-3,54; p = 0,007), la presencia de discordancia lipídica se asoció con una mayor probabilidad de presentar PAC.
Conclusión: En pacientes obesos, la discordancia lipídica se asoció con una mayor prevalencia de PAC. Evaluar pacientes obesos con esta estrategia podría identificar a los sujetos con mayor riesgo cardiovascular residual.

Introduction

Obesity is currently considered a worldwide epidemic.[1] Weight increase is associated with other cardiovascular risk factors such as arterial hypertension, dyslipidemia, diabetes, and metabolic syndrome.[2] In the general population, a higher body mass index (BMI) is associated with increased cardiovascular morbidity and mortality.[3]

The lipid profile of obese individuals is usually characterized by high triglyceride levels, low HDL-cholesterol concentrations, and a greater presence of remnant cholesterol and small and dense LDL-cholesterol particles.[4] However, not all obese subjects have the metabolic alterations commonly seen in patients of this kind. Thus, it has been postulated that cardiovascular risk in obese patients is not homogeneous.[5–7] Although LDL-cholesterol is considered the primary therapeutic target, recent guides recognize non-HDL-cholesterol as a relevant lipid target.[8–10] This lipid marker is easy to record and affords greater precision in estimating the total atherogenic particles. A consensus has been reached which defines the non-HDL-cholesterol target as 30 mg/dl above the LDL-cholesterol target.

There is evidence that the presence of carotid atherosclerotic plaque (CAP) improves the prediction of cardiovascular events when this information is incorporated into a model constructed with the traditional risk factors.[11] Likewise, the prevalence of CAP among obese patients is considerable, and increases with increasing risk scores (based on the risk factors).[6]

Taking the above into account, we raise the possibility that obese individuals with non-HDL-cholesterol levels 30 mg/dl above the LDL-cholesterol levels (lipid discordance) have a greater prevalence of subclinical atheromatosis.

The objectives of the present study were: (1) to determine the prevalence of lipid discordance in a population of obese adults seen in cardiovascular prevention clinics without cardiovascular disease, diabetes or lipid-lowering treatment; and (2) to investigate the association between lipid discordance and the presence of CAP.

Material and methods

A multicenter, descriptive cross-sectional study was made of consecutive samples from cardiovascular prevention clinics in 6 cardiology centers of the *Ciudad Autónoma de Buenos Aires* and *Gran Buenos Aires* (Argentina).

The study included individuals over 18 years of age with obesity (BMI $\geq 30\,kg/m^2$) who were evaluated in the clinic for the screening of cardiovascular risk or the management of risk factors. The exclusion criteria were: (1) previous cardiovascular disease; (2) a personal history of diabetes mellitus; (3) previous lipid-lowering treatment; (4) hypertriglyceridemia secondary to thyroid gland disorders, renal failure, toxic agents or drugs.

Clinical and laboratory parameters (lipid profile with 12 h fasting, including total cholesterol, HDL-cholesterol and triglycerides) were analyzed. The Friedewald formula was used to calculate LDL-cholesterol. The triglyceride/HDL-cholesterol ratio was used as an insulin resistance marker. Remnant cholesterol was calculated from the following formula: (total cholesterol) – (HDL-c) – (LDL-c). The Castelli