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ORIGINAL ARTICLE

Risk factors associated with the carotid intima-media thickness and plaques: ESPREDIA Study☆

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KEYWORDS
Carotid plaques;
Intima-media thickness;
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Abstract
Objective: To evaluate whether there were any differences in the risk factor profile associated with either the intima-media thickness (IMT) or the presence of carotid plaques.
Methods: Cross-sectional study in 1475 subjects between 45 and 75 years, randomly selected from the population of the Northwest area of Madrid (Spain). They had a physical exam, blood analysis, and ultrasound measurement of the IMT and of the presence of plaques.
Results: Mean IMT was 0.725 ± 0.132 mm. Forty seven percent of the participants had carotid plaques. In multivariate analysis, factors directly associated with the IMT were, age (β 0.227, $p < 0.0001$), sex (β 0.104, $p < 0.0001$), presence of hypertension (β 0.082, $p = 0.002$), diabetes (β 0.130, $p < 0.0001$) and current smoking (β 0.107, $p < 0.0001$), systolic blood pressure (SBP) (β 0.219, $p < 0.0001$) and LDL-cholesterol levels (β 0.074, $p = 0.003$), and inversely, diastolic blood pressure (DBP) (β −0.124, $p = 0.001$), HDL-cholesterol (β −0.111, $p < 0.0001$) and triglyceride levels (β −0.060, $p = 0.028$). The presence of plaques was directly associated with age (OR 1.08; 95% CI: 1.05–1.10), sex (OR 1.95; 95% CI: 1.52–2.51), current smoking (OR 2.75; 95% CI: 1.92–3.95), history of hypertension (OR 1.58; 95% CI: 1.22–2.04) or diabetes (OR 1.84; 95% CI: 1.31–2.58), statin treatment (OR 1.56; 95% CI: 1.19–2.04) and SBP (OR 1.03; 95% CI: 1.02–1.05), and inversely with DBP (OR 0.98; 95% CI: 0.96–0.99).

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◊ Members of the ESPREDIA Group are listed in Appendix.

Conclusion: Factors associated with the IMT and the presence of plaques are similar, a finding that support a continuum between muscular layer hypertrophy and arteriosclerosis development.

PALABRAS CLAVE
Placas carotídeas;
Grosor íntima-media;
Factores de riesgo cardiovascular;
Carótidas

Factores de riesgo asociados con el grosor íntima-media y la presencia de placas en arteria carótida: Estudio ESPREDIA

Resumen
Objetivo: Evaluar si existen diferencias en el perfil de factores de riesgo asociados con el grosor íntima-media (GIM) y la presencia de placas carotídeas.
Métodos: Estudio transversal de base poblacional, en 1.475 sujetos de entre 45 y 75 años de edad, seleccionados de forma aleatoria de los registros de Atención Primaria del área noroeste de Madrid. Se les realizó una exploración física, una analítica y se les determinó el GIM en carótida común y la presencia de placas mediante ecografía.
Resultados: El GIM medio de la población fue de 0.725 ± 0,132 mm. El 47% presentaban placas carotídeas. En el análisis multivariante, los factores relacionados con el GIM fueron: edad (β 0,227, p < 0,0001), sexo (β 0,104, p < 0,0001), presencia de hipertensión (β 0,082, p = 0,002), diabetes (β 0,130, p < 0,0001) y tabaquismo activo (β 0,107, p < 0,0001), presión arterial sistólica (PAS) (β 0,219, p < 0,0001) y concentración de colesterol LDL (β 0,074, p = 0,003), y de forma inversa, presión arterial diastólica (PAD) (β −0,124, p = 0,001) y concentraciones de colesterol HDL (β −0,111, p < 0,0001) y triglicéridos (β −0,060, p = 0,028). La presencia de placas se asoció de forma directa con edad (OR 1,08; IC 95%: 1,05-1,10), sexo (OR 1,95; IC 95%: 1,52-2,51), tabaquismo activo (OR 2,75; IC 95%: 1,92-3,95), antecedente de hipertensión (OR 1,58; IC 95%: 1,22-2,04) y de diabetes (OR 1,84; IC 95%: 1,31-2,58), consumo de estatinas (OR 1,56; IC 95%: 1,19-2,04) y PAS (OR 1,03; IC 95%: 1,02-1,05), y de forma inversa con PAD (OR 0,98; IC 95%: 0,96-0,99).
Conclusión: Los factores de riesgo asociados con el GIM y la presencia de placas son similares, un dato que apoya el continuo entre la hipertrofia de la capa muscular y el desarrollo de arteriosclerosis.

Introduction

Numerous epidemiological studies have shown a direct relationship between the presence of carotid atherosclerosis, evaluated by measuring the intima-media thickness (IMT) or the presence of plaque, and the development of cardiovascular complications and death.[1–3] It is estimated that for every 0.1 mm increase in carotid IMT, the risk of myocardial infarction increases by 15% and the stroke risk increases by 18%.[4] Likewise, carotid plaque increases the risk of infarction, stroke and death to varying degrees according to studies.[5] Measuring IMT as a predictor of cardiovascular risk has also been evaluated in terms of changes over time.[6,7]

The clinical usefulness of IMT or carotid plaque detection, however, has been widely questioned. Given the close correlation between traditional risk factors and subclinical carotid disease, the incremental value of IMT in improving cardiovascular risk prediction, beyond risk equation estimates, is probably limited.[8,9] Although some studies suggest that measuring IMT improves risk estimates,[2,10] others consider improvements in predictions to be irrelevant.[8,9] However, systematic reviews indicate that plaque detection is better than IMT[5,11] for improving vascular risk estimates. European guidelines on cardiovascular disease prevention currently recommend determining the presence of plaque but not IMT[12] in subjects at intermediate risk. American guidelines only mention IMT, but do not explicitly recommend its measurement.[13]

Numerous studies have suggested that IMT and plaque are two different entities with different pathophysiology.[14] In fact, there is no agreement between the different studies as to which risk factors are best associated with which entity. One of the factors that has traditionally caused much confusion with regard to this association is the site of IMT measurement. Measurement at the carotid bulb or internal carotid artery is better associated with the presence of plaque and coronary heart disease risk than measurement at the common carotid artery.[14]

The objective of this study was to evaluate the degree of correlation between different traditional risk factors and either IMT measured at the common carotid artery or the presence of plaque in a random sample of the