



ORIGINAL ARTICLE

Does metabolic syndrome predict significant angiographic coronary artery disease?

Ana Teresa Timóteo*, Miguel Mota Carmo, Rui Cruz Ferreira

Cardiology Department, Santa Marta Hospital, Centro Hospitalar Lisboa Central, EPE, Lisboa, Portugal

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KEYWORDS

Metabolic syndrome;
Diabetes;
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Abstract

Introduction: Metabolic syndrome (MS) is an independent predictor of acute cardiovascular events. However, few studies have addressed the relationship between MS and stable angiographic coronary artery disease (CAD), which has a different pathophysiological mechanism. We aimed to study the independent predictors for significant CAD, and to analyze the impact of MS (by the AHA/NHLBI definition) on CAD.

Methods: We prospectively included 300 patients, mean age 64 ± 9 years, 59% male, admitted for elective coronary angiography (suspected ischemic heart disease), excluding patients with known cardiac disease. All patients underwent assessment of demographic, anthropometric, and laboratory data and risk factors, and subsequently underwent coronary angiography.

Results: In the study population, 23.0% were diabetic, 40.5% had MS (and no diabetes) and 36.7% had neither diagnosis. Significant CAD was present in 51.3% of patients. CAD patients were older and more frequently male and diabetic, with increased triglycerides and glucose and lower HDL cholesterol. Abdominal obesity was also less prevalent. MS was not associated with the presence of CAD (OR 0.94, 95% CI 0.59–1.48, $p=0.778$). Of the MS components, the most important predictors of CAD were increased glucose and triglycerides. Abdominal obesity was associated with a lower risk of CAD. In a multivariate logistic regression model for CAD, independent predictors of CAD were age, male gender, glucose and triglycerides. Body mass index had a protective effect.

Conclusions: Although MS is associated with cardiovascular events, the same was not found for stable angiographically proven CAD. Age, gender, diabetes and triglycerides are the most influential factors for CAD, with abdominal obesity as a protective factor.

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* Corresponding author.

E-mail address: ana.timoteo@yahoo.com (A.T. Timóteo).

PALAVRAS-CHAVE

Síndrome Metabólica;
Diabetes;
Doença arterial
coronária;
Obesidade

Poderá a presença de síndrome metabólica prever a presença de doença arterial coronária angiograficamente significativa?

Resumo

Introdução: A síndrome metabólica (SM) é um predizente independente de eventos cardiovasculares agudos. Contudo, poucos estudos analisaram a relação entre SM e doença arterial coronária angiográfica estável (DAC), que apresenta um diferente mecanismo fisiopatológico. Procurámos identificar os factores predizentes independentes para DAC e analisar o impacto da presença de SM (pela definição da AHA/NHLBI) na DAC.

Métodos: Analisamos prospectivamente 300 indivíduos, com idade média de 64 ± 9 anos, 59% do género masculino, admitidos para angiografia coronária eletiva por suspeita de cardiopatia isquémica, tendo sido excluídos os doentes com antecedentes de doença cardíaca. Todos os doentes foram submetidos a avaliação demográfica, antropométrica, factores de risco e laboratorial e subsequentemente a coronariografia.

Resultados: Na população do estudo, 23,0% eram diabéticos, 40,5% tinha SM (sem diabetes) e 36,7% nenhum dos anteriores diagnósticos. Verificou-se DAC significativa em 51,3% dos doentes. Estes doentes tinham mais idade, mais do género masculino, diabéticos, com triglicéridos e glicemia aumentados e colesterol-HDL baixo. A obesidade abdominal era também menos prevalente. A SM não se associou com a presença de DAC (OR 0,94, IC 95% 0,59–1,48, $p=0,778$). Os factores predizentes mais importantes de DAC de entre os componentes de SM foram a glicemia e os triglicéridos aumentados. A obesidade abdominal mostrou menor risco de DAC. Num modelo de regressão logística multivariável para DAC, os factores predizentes independentes foram a idade, género masculino, glicemia, triglicéridos. O Índice de Massa Corporal mostrou efeito «protector».

Conclusões: Apesar da SM se associar a eventos cardiovasculares, o mesmo não se verifica relativamente a DAC angiográfica estável. A idade, género, diabetes e triglicéridos são os factores mais influentes para a presença de DAC, sendo a obesidade abdominal «protectora».

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Introduction

Obesity and metabolic syndrome are major epidemics of the 21st century worldwide.^{1,2} The best available evidence, from three consecutive large meta-analyses, consistently shows that individuals with metabolic syndrome are at increased risk of cardiovascular events (two-fold increase in cardiovascular outcomes – cardiovascular mortality, myocardial infarction and stroke – and a 1.5-fold increase in all-cause mortality).^{3–5} They also demonstrated that cardiovascular risk was still high in patients with the metabolic syndrome but without diabetes.

Although the association of metabolic syndrome with cardiovascular events is clear, the association with stable angiographic coronary artery disease (CAD) is less so, the few available studies being based on small samples and showing contradictory results.^{6–11} In the literature, some authors have assessed the association between metabolic syndrome, diabetes and severity of angiographic CAD in cross-sectional and longitudinal studies, but they either considered one gender or studied ethnicities other than Caucasian, or they did not compare diabetic and non-diabetic individuals. In a larger study of stable CAD patients, the presence of metabolic syndrome identified increased risk of death or myocardial infarction but did not have independent prognostic significance after adjustment for its constituent components. Hypertension, low HDL cholesterol and elevated glucose most strongly predicted events.¹²

The aim of the present study was to assess the association between metabolic syndrome and angiographic CAD. We also compared individuals with metabolic syndrome and those with diabetes (in whom the association with CAD is clearly established and for some authors is responsible for the metabolic syndrome's impact on cardiovascular outcomes) and with a control group with neither diagnosis ('Normal' group).

Methods

This was an observational cross-sectional study, with prospective inclusion of patients admitted for elective coronary angiography with suspected CAD (stable angina and/or ischemia documented by non-invasive tests). All patients were aged ≥ 18 years. Patients with previous acute coronary syndrome, myocardial revascularization procedure, valvular heart disease, congenital heart disease or cardiomyopathy were excluded from the study. All patients gave their written informed consent and the study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki as reflected in prior approval by the local institutional ethics committee.

Anthropometric data were obtained after a 12-hour fast, with the subject in light clothing and barefoot. Body weight was measured to the nearest kilogram using a digital scale, and height to the nearest centimeter in the standing position. Body mass index (BMI) was calculated as weight in

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