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ORIGINAL ARTICLE

Study of conicity index, body mass index and waist circumference as predictors of coronary artery disease☆

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KEYWORDS
Cardiovascular disease;
Risk factors;
Abdominal obesity;
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Population

Abstract
Introduction and Objective: Obesity is a major risk factor for cardiovascular disease. This study was designed to assess whether the conicity index (CI), body mass index (BMI) and waist circumference (WC) can be used as predictors of coronary artery disease (CAD) and mortality in a middle-aged population of the north-western region of Rio Grande do Sul, Brazil.
Methods: This was a retrospective, longitudinal cohort study, based on the medical records of patients seen in a cardiology institution in a rural area of Rio Grande do Sul. The sample consisted of 2396 individuals. The primary endpoint was diagnosis of CAD, with mortality as the secondary endpoint. CI, BMI and WC were assessed using logistic regression, Cox regression and receiver operating characteristic curve analysis.
Results: The study showed that none of the anthropometric measures could be considered independent factors for either a diagnosis of CAD or mortality. Female gender was associated with a significantly lower risk of CAD (odds ratio [OR]: 0.31; 95% confidence interval [CI]: 0.22-0.44), as was absence of diabetes (OR: 0.52; 95% CI: 0.33-0.82), while there was a significantly higher risk of mortality associated with the presence of CAD (OR: 3.56; 95% CI: 2.00-6.32) and alcohol consumption (OR: 3.55; 95% CI: 1.60-7.90).

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Conclusions: These anthropometric measures were not independent predictive factors for CAD diagnosis or mortality in a population in southern Brazil. Our results support the conclusion that determination of CI, BMI and WC alone is insufficient to assess the risk of CAD and mortality in the general population.

PALAVRAS-CHAVE
Doenças cardiovasculares;
Fatores de risco;
Obesidade abdominal;
Mortalidade;
População

Estudo do índice de conicidade, índice de massa corporal e circunferência abdominal como preditores de doença arterial coronariana

Resumo
Introdução e objetivo: A obesidade é um importante fator de risco para doenças cardiovasculares. O objetivo deste estudo foi avaliar se o índice de conicidade (IC), índice de massa corporal (IMC) e circunferência abdominal (CA) podem ser usados como preditores de doença arterial coronariana (DAC) e mortalidade em uma população de meia-idade da região noroeste do Rio Grande do Sul, Brasil.
Métodos: Estudo de coorte retrospectiva, longitudinal, realizado com o registro dos prontuários de indivíduos atendidos em uma instituição cardiológica do interior do Rio Grande do Sul, Brasil. A amostra constou de 2396 indivíduos. Foram consideradas como variáveis de desfecho primário o diagnóstico de DAC e secundário a mortalidade. O IC, IMC e CA foram analisados através de regressão logística, regressão de Cox e curva ROC.
Resultados: O estudo mostrou que nenhuma das medidas antropométricas pôde ser considerada como fatores independentes, tanto para o diagnóstico de DAC, quanto para a mortalidade. Houve uma redução significativa do risco para DAC associada com o sexo feminino (*odds ratio* [OR]: 0,31; intervalo de confiança [IC95%]: 0,22-0,44) e ausência de diabetes *mellitus* (OR: 0,52; IC95%: 0,33-0,82) e um aumento significativo do risco de mortalidade associada à presença de DAC (OR: 3,56; IC95%: 2,00-6,32) e etilismo (OR: 3,55; IC95%: 1,60-7,90).
Conclusão: As medidas antropométricas não se mostraram importantes como fator preditivo independente para o diagnóstico de DAC e mortalidade em uma população estudada no sul do Brasil. Nossos resultados suportam o conceito de que a mensuração isolada do IC, IMC e CA não são suficientes na avaliação do risco de DAC e mortalidade na população geral.

Introduction

The incidence of many chronic diseases is high among obese individuals and the distribution of body fat has been the subject of research on obesity, since the metabolic and cardiovascular repercussions tend to be more severe when body fat is centralized, i.e. concentrated in the abdominal region.[1,2]

There is consensus that abdominal obesity is in turn related to the amount of visceral adipose tissue, and is an independent risk factor for cardiovascular disease.[3–5] Visceral fat is metabolically more active than subcutaneous fat[6] and correlates closely with insulin resistance.[6–8] Excessive abdominal fat is associated with various metabolic disorders and with higher morbidity and mortality from atherosclerotic conditions such as coronary artery disease (CAD).[9,10]

The best anthropometric measure to assess the risk associated with obesity has not been established. Body mass index (BMI), obtained by dividing a person's weight in kg by the square of their height in m, is the measure of general obesity most commonly used in epidemiological studies,[11] but it has been suggested that fat mass distribution is a better predictor of disease than general obesity.[11,12]

Waist circumference (WC), a measure of both subcutaneous and visceral fat, is easily determined and is frequently used as a measure of abdominal adiposity in epidemiological studies.[13,14] WC is a more effective measure of body fat than BMI,[11] since it correlates strongly with visceral fat, which is harmful to health.[12]

In 1991 Valdez[15] proposed the conicity index (CI) as a model to assess obesity and body fat distribution. This includes the variables of weight, height and WC, thus weakening the correlation between WC and height, on the