ETHNIC AND SEX DIFFERENCES IN DISEASE BURDEN IN PATIENTS UNDERGOING CORONARY ANGIOGRAPHY: THE CONFOUNDING INFLUENCE OF OBESITY

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Background: Data from cohort studies, predominantly in Caucasians, have identified obesity as a major risk factor for coronary artery disease (CAD), irrespective of sex. In contrast, reports examining the effects of obesity on mortality in African Americans suggest a weak relationship between body mass index (BMI) and mortality, particularly among women. Data correlating body weight with angiographic severity of CAD is sparse in minority populations. We sought to investigate ethnic-sex differences in the influence of obesity on the extent and severity of CAD.

Methods: We studied 640 patients (66.9% African American) who underwent coronary angiography at a tertiary care center. Cardiovascular risk factor profiles and CAD burden, quantified by the Duke Myocardial Jeopardy scoring system, a validated prognostication tool, were compared across ethnic and sex groups.

Results: Clustering of major cardiovascular risk factors, a higher prevalence of obesity classes II and III, and a statistically significant inverse correlation between BMI and Duke scores were observed among the cohort of African American women. General linear model analysis and stepwise multiple linear regression analysis revealed Duke score to be negatively associated with BMI and higher classes of obesity after adjustment for age and other cardiovascular risk factors in African American women but not in other subgroups.

Conclusions: The observed inverse relationship between BMI and angiographic severity of CAD in African American women is novel and appears to support prior data on the weak association between BMI and cardiovascular mortality in this subgroup. (*Ethn Dis*. 2008;18:53–58)

Key Words: Obesity, Coronary Artery Disease, Race, Ethnicity, Gender, African American, Angiography, Body Mass Index, Myocardial Jeopardy Score

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INTRODUCTION

The Framingham study and cohort studies that examined the effects of obesity on cardiovascular morbidity and mortality have consistently reported a positive association between excess body weight and the prevalence of coronary artery disease (CAD) in Caucasian men and women.[1,2] In contrast, several reports of the effects of adiposity on cardiovascular mortality among African Americans suggest that adiposity may be a less important predictor of mortality among African Americans than in Caucasians, particularly among women.[3–10] In fact, the overall relationship between body weight and incident CAD is less well defined for African Americans, and data correlating body weight with the prevalence and angiographic severity of CAD in the African American population are sparse in men[11] and nonexistent in women. We attempted to characterize ethnic-sex differences in the association between body mass index (BMI) and CAD burden as quantified by the Duke Myocardial Jeopardy scoring system, a validated prognostication tool also predictive of one-year mortality in patients treated medically or with percutaneous intervention.[12]

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METHODS

We screened 962 consecutive patients who were referred for coronary angiography from January 2005 to October 2005 to a tertiary care referral center. Exclusion criteria included ethnicity other than Caucasian or African American ($n=130$) and patients with a history of coronary artery bypass graft surgery ($n=192$). After exclusions, 640 patients made up the final study cohort. Clinical and demographic characteristics including age (in years), ethnicity (Caucasian or African American), sex, diabetes mellitus as per American Diabetic Association (ADA) criteria, dyslipidemia per National Cholesterol Education Program (NCEP) criteria, hypertension per Joint National Committee (JNC 7) criteria, cigarette smoking and family history of CAD were abstracted through a retrospective cross-sectional survey of patient charts. In addition, the use of antihypertensive, antidiabetic, or cholesterol-lowering medications were used as criteria for hypertension, diabetes, and dyslipidemia, respectively. Obesity was classified according to BMI, using the National Institutes of Health (NIH) criteria as normal (BMI 21–24 kg/m^2), overweight (BMI 25–29 kg/m^2), obesity class I (BMI 30–34 kg/m^2), obesity class II (BMI 35–39 kg/m^2), and obesity class III (BMI $\geq$40 kg/m^2).[23]

Coronary angiography data was obtained from the Siemens Queries software system, which maintains the database that includes detailed angiographic findings of all patients at this institution. Significant lesions were