

Oral presentation

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Obesity and right ventricular structure and function: the MESA-RV study

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Introduction

The relationship between obesity and right ventricle (RV) has been inadequately studied due to difficulty in imaging its more complex geometry by echocardiography. While obesity associated RV diastolic dysfunction has been shown, inconclusive data exists regarding systolic function. We aimed to determine the association between obesity and RV structure and function by cardiac magnetic resonance imaging (MRI) in a large multi-ethnic cohort.

Purpose

We hypothesized that obesity would be associated with greater RV mass, larger RV end-diastolic volume (EDV), and lower RV ejection fraction (EF).

Methods

Cardiac MRIs were analyzed from 1973 participants in the Multi-Ethnic Study of Atherosclerosis, which included individuals aged 45-84 years without clinical cardiovascular disease. Participants were divided into 3 categories based on BMI: normal (18.5-24.9 kg/m²), overweight (25-29.9 kg/m²) and obese (= 30 kg/m²). Associations with RV measures were determined using multivariable regression.

Results

The mean age was 62 ± 10 years, 47% were men. 43% were white, 28% African American, 20% Hispanic, and 9% Asian. In multivariable analyses adjusted for age, ethnicity, gender, cardiovascular risk factors and height, obesity was associated with higher RV mass, larger RVEDV (3.1 g/17% higher & 22.7 ml/20% higher respectively, p <

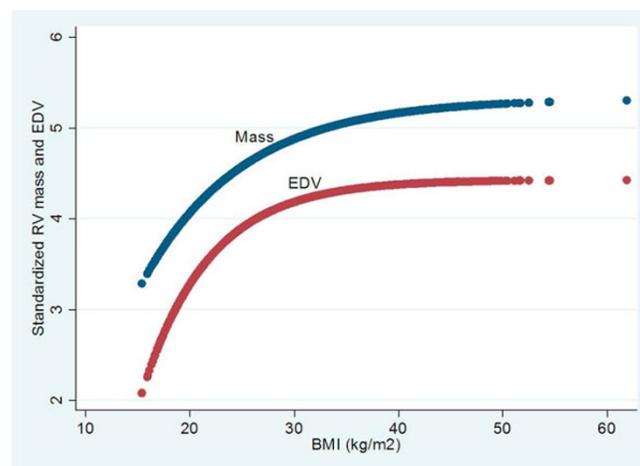


Figure 1

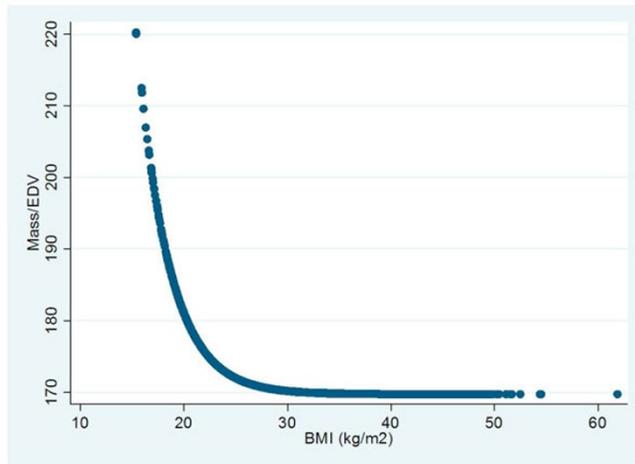


Figure 2

0.0001) and lower RVEF, mass/EDV ratio (-0.9%, $p < 0.05$; -8.1 mg/ml, $p < 0.0001$) as compared to normal BMI category participants. These findings persisted after adjusting for the respective left ventricle (LV) parameter. Within each BMI category, RV mass and EDV were positively associated with BMI while mass/EDV was negatively associated with BMI only in the normal BMI category Figures 1 and 2.

Conclusion

In a cohort free of clinical cardiovascular disease, obesity was significantly associated with higher RV mass, RVEDV and lower RVEF even after adjustment for the LV. Future studies should examine the mechanism of this effect on the RV.

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