Abstract: 200

Vasodilator stress perfusion CMR is feasible and has prognostic value in morbid obese patients without known CAD

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Topic(s):
Stress CMR

Citation:

Funding Acknowledgements:
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BACKGROUND
Obesity is a growing public health problem. Given the impact of obesity on cardiovascular disease, methods to effectively risk stratify obese patients are needed. Current methods for the detection of myocardial ischemia by single photon emission computed tomography or stress echocardiography remain limited in obese patients. Stress cardiac magnetic resonance (CMR) may be a powerful alternative, but its feasibility and prognostic value in the obese population has not been specifically evaluated.

OBJECTIVES
This study sought to determine feasibility and prognostic value of vasodilator stress perfusion CMR in morbid obese patients with body mass index (BMI) = 40 kg/m\textsuperscript{2}.

METHODS
Consecutive patients with a BMI = 40 kg/m\textsuperscript{2} and without known coronary artery disease (CAD) referred for vasodilating stress CMR were followed for major adverse cardiovascular events (MACE), defined as cardiac death, non-fatal myocardial infarction or stroke. Univariable and multivariable Cox regressions for MACE were performed to determine the prognostic association of inducible ischemia or late gadolinium enhancement (LGE) by CMR.

RESULTS
Of 452 obese patients, 444 (98\%) completed the CMR protocol with good diagnostic imaging quality; among those, 404 (91\%) completed the follow-up (mean 5.6 ± 2.2 years). Participants averaged 59 ± 11 years in age with 44\% of men (mean BMI 43.9 ± 3.8 kg/m\textsuperscript{2}, maximum weight 210 kg and maximum BMI 67.1 kg/m\textsuperscript{2}). Stress CMR was well tolerated without severe adverse event. Reasons for failure to complete CMR included claustrophobia (n = 3), declining participation (n = 4) and intolerance to stress agent (n = 1). Patients without inducible ischemia or LGE experienced a substantially lower annual rate of MACE (3.3\% vs. 12.4\% for those with ischemia and vs. 11.2\% for those with ischemia and LGE). In a multivariable stepwise Cox regression including clinical characteristics and CMR indexes, the absence of inducible ischemia was independently associated with a lower incidence of MACE at follow-up (hazard ratio 0.20; 95\% confidence interval: 0.11 to 0.36; p<0.0001) (Figure). When patients with early coronary revascularization (within 30 days of CMR) were censored on the day of revascularization, both presence of inducible ischemia and ischemia extent per segment maintained a strong association with MACE. Using Kaplan-Meier analyses, myocardial ischemia identified future CV events/survival (p=0.0001), and this finding was similar in men and women (p = 0.16)

CONCLUSION
Stress CMR is feasible and of high prognostic value in morbid obese patients, with a very low negative event
rate at 5 years in patients without ischemia or infarction as opposed to patients with inducible ischemia and/or presence of myocardial infarct.

Figure: Kaplan–Meier curves describes the occurrence of MACE in morbid obese patients with or without inducible ischemia