

Meeting abstract

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I20 Assessment of wall motion score index by dobutamine cardiovascular magnetic resonance predicts future cardiac events in patients with mild to moderate, but not severe reduction of left ventricular ejection fraction

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Introduction

Dobutamine cardiovascular magnetic resonance (DCMR) can identify individuals with a poor cardiac prognosis when they have a normal resting left ventricular (LV) ejection fraction (LVEF).

Purpose

We sought to determine the predictive value of DCMR results for predicting cardiac events in individuals with a moderately to severely reduced resting LVEF.

Methods

Two-hundred consecutively referred patients aged 64 ± 11 years with a LVEF $\leq 55\%$ that were poorly suited for stress echocardiography, underwent DCMR in which rest, low dose, peak dobutamine/atropine stress were completed. Left ventricular wall motion score index (WMSI), defined as the average wall motion score of 17 myocardial segments (1 = normal, 2 = hypokinetic, 3 = akinetic, 4 = dyskinetic scored for each segment) was assessed at all 3 stages of stress. All 200 participants were contacted again at an average of 5 years after DCMR. The post DCMR events of cardiac death, myocardial infarction (MI), and unstable angina or congestive heart failure warranting hospitalization were confirmed by review of participants' medical records.

Results

One hundred forty subjects had a stable or increased WMSI with dobutamine and during the follow-up period 63 (45%) experienced any cardiac event and 19 (14%) experienced a MI or cardiac death. Sixty subjects had an increase in WMSI during dobutamine with 43 (72%) experienced any event, and 16 (27%) had a recorded MI or cardiac death. After adjustment for cardiovascular risk factors, subjects with an increase in WMSI during stress DCMR had reduced event free survival ($p < 0.001$). After accounting for resting LVEF, the hazard ratio (HR) for having an event due to an increase in WMSI was 2.20 ($p = 0.0015$) for patients with a LVEF $>40\%$. For patients with a LVEF $<40\%$, the HR due to either an increase in WMSI during dobutamine or an absence of an increase in WMSI during dobutamine, was 3.64 and 2.84, respectively. Importantly, after accounting for a resting LVEF $<40\%$, an increase in WMSI during intravenous dobutamine did not independently predict future MI and cardiac death (HR = 1.36, $p = 0.36$).

Conclusion

In patients with a LVEF of 40% to 55%, stress induced changes in LV WMSI observed during DCMR predict adverse cardiac events beyond resting LVEF. In patients with a LVEF $<40\%$, procedures other than observation of

dobutamine induced change in LV wall motion should be considered to predict future MI and cardiac death.

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