

Diagnostic Performance of Cardiac Stress Testing Following Exclusion of Acute Myocardial Infarction with a 0/1-Hour, High-Sensitivity Cardiac Troponin Protocol

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Background: Rapid exclusion of acute myocardial infarction (AMI) is critical for patients presenting to emergency departments (EDs) with chest pain or other anginal equivalents. High-sensitivity cardiac troponin (hs-cTn) protocols have been widely adopted in the United States for this purpose. These protocols allow for early identification and exclusion of patients with AMI using a 0 and 1-hour hs-cTn measurement. However, little is known about the use of cardiac stress testing in patients who ruled-out for AMI within 1 hour with very low hs-cTn values. This study analyzed the diagnostic performance of cardiac stress tests in this population.

Methods: We performed a secondary analysis of the RACE-IT trial, a stepped-wedge cluster randomized trial performed across 9 EDs in a large metropolitan health system from July 2020 through March 2021. The eligibility criteria for the trial mirrored the real-world use of hs-cTn testing, including both patients complaining of chest pain and/or other anginal equivalents. All adults with a hs-cTnI and electrocardiogram (ECG) completed in the ED were enrolled, while patients with ST-segment elevation AMI, trauma, or pregnancy were excluded. In the interventional arm of the trial, AMI was excluded if hs-cTnI was <4 ng/L at presentation or =4 ng/L at presentation with a 1-hour value < 8 ng/L. The trial followed all patients through 30 days to assess for AMI or death and captured all cardiac testing. We compared stress testing results to invasive coronary imaging with or without revascularization.

Results: 10,444 study patients (43.61%) ruled out for AMI in the ED within 1 hour and were included in this analysis. There were 320 (3.0%) patients who had a stress test within 30 days, with few ischemic findings (25, 0.24%) or revascularization procedures (5, 0.05%). The positive predictive value of stress testing in this population to identify the need for revascularization was 10.1% (95% CI 2.8% - 29.4%). Table 1 displays the proportion of ischemic stress tests and overall test performance in this population. The rate of 30-day death or AMI was low (17, 0.20%) among those discharged from the ED or placed in observation (n=8,553).

Conclusions: Our study highlights the infrequent use and low diagnostic yield of stress testing in patients who have been ruled out for AMI within 1 hour using an accelerated hs-cTn protocol in the ED.