Diagnostic Accuracy of a New High-Sensitivity Troponin I Assay and Five Accelerated Diagnostic Pathways for Ruling Out Acute Myocardial Infarction and Acute Coronary Syndrome

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Background: HS troponin I was approved by FDA for use in US in 2018. Traditional troponin 0 and 3 hour rapid rule out protocol with a low risk Heart Score has been demonstrated to achieve a MACE <1%. This study looked at a 0 and 2 hour HS troponin I in conjunction with 5 different accelerated chest pain pathways.
Clinical Question: what are the sensitivity and specificity of 5 accelerated chest pain pathways in conjunction with a 0 and 2 hour HS troponin for identifying AMI or ACS in next 30 days.
What they did:

- HS Trop I measured on arrival and at 2 hours in 1811 patients who presented to ED with possible cardiac CP
- 1 center in Austrailia.
- Individuals were retrospectively classified as low risk or not according to the m-ADAPT, EDACS, HEART, new Vancouver Chest Pain Rule and No Objective Testing Rule.
- History and ECG were retrospectively calculated for the HEART score.
- 99th percentile cutoff for the Access hs-TnI assay (18ng/L), as well as sex specific 12 for females, 20 for males.

Outcomes:

- Primary: 30-day AMI (died of cardiac cause, dx of STEMI or NSTEMI or emergency PTCA).
- Secondary: 30-day ACS (AMI criteria above or unstable angina diagnosis, unplanned revascularization).

Inclusion:

- >/=18yo, greater than or equal for 5 minutes of CP consistent with potential ACS without a clear noncardiac source.

Exclusion:

- Clear alternative cause for the symptoms
- Unwilling or unable to provide consent
- Pregnant
- Could not be contacted after discharge (e.g., homeless)
- Transfer from another hospital
- STEMI on initial EKG.

Results:

- 5.3% had AMI, and 7.7% had ACS.
- Initial HS Trop was 76% sensitive for AMI (95% CI 66.3-84.2%).
- 2 hour HS Trop 89.6% sensitive for AMI (81.7%-94.9%).
- m-ADAPT sensitivity for AMI 96.9%, 92.8% sensitivity for ACS, 64.3% classified as low-risk.
- EDACS 97.9% sensitivity for AMI, sensitivity for ACS 92.1%, 62.5% classified as low risk.
- HEART sensitivity 97.9% for AMI, 95% for ACS, 49.8% classified as low risk.
- Vancouver Chest Pain Rule sensitivity for AMI 100% (95% CI 96.2-100%), 98.6 sensitivity for ACS (95% CI 94.9%-99.8%), 28.2% classified as low-risk.
- No Objective Testing Rule 100% sensitive for AMI, 99.3% sensitivity for ACS, 34.5% classified as low-risk.

Conclusion: In this cohort with a low prevalence of acute myocardial infarction and acute coronary syndrome, using the Beckman's Access high-sensitivity troponin I assay with the new Vancouver Chest Pain Rule or No Objective Testing Rule enabled approximately one third of patients to be safely discharged after 2-hour risk stratification with no further testing. The EDACS, m-ADAPT, or HEART pathway enabled half of ED patients to be rapidly referred for objective testing.