Myocardial infarction: rapid ruling out in the emergency room

 Patients with symptoms of possible acute coronary syndrome make up a large proportion of people who present to emergency departments, where they undergo lengthy, intensive, and costly assessments. Yet few are finally diagnosed with an acute coronary syndrome. Improvements in methods to exclude acute coronary syndrome are needed to reliably reassure and safely discharge low-risk patients who can then proceed to further investigations as outpatients. High-sensitivity cardiac troponin assays are reliable and have low thresholds of detection. But how to take full advantage of this improved precision in clinical care is unclear.

In The Lancet, Anoop Shah and colleagues report results of a prospective observational cohort study of 6304 patients presenting at emergency departments with suspected acute coronary syndrome. They identified a threshold for a high-sensitivity cardiac troponin assay below which patients were at low risk of type 1 myocardial infarction and potentially suitable for early discharge from hospital. The primary outcome was index myocardial infarction, or subsequent myocardial infarction or cardiac death at 30 days. The investigators derived 5 ng/L as the optimum cutoff for cardiac troponin I concentration, using a predefined negative predictive value of 99.5% as an acceptable threshold of safety. This threshold enabled a large proportion of the total patients presenting to emergency departments (2311 [47%] of 4870) assessed for possible myocardial infarction to be identified on presentation as at low risk for events at presentation and at 30 days. For those patients who were not identified as having a myocardial infarction on presentation (2311 [61%] of 3799), this threshold had a negative predictive value of 99.6% (95% CI 99.4–99.9). The results were validated in two cohorts of 1434 patients presenting to emergency departments with similar positive findings (overall negative predictive value 99.4%, 95% CI 98.8–99.9).

The negative predictive value, although an accepted method of evaluating screening tests of exclusion, is affected by disease prevalence, and this should be considered in different emergency department populations.

These findings are highly promising. The investigators identified some aspects of clinical practice that might have affected the findings. Fewer than 42% (1608 of 3799) patients had serial troponin testing despite guideline recommendations. Patients with a delayed increase in troponin after the initial test might therefore not have been identified as having an acute myocardial infarction, and missed events might be more common than reported. Furthermore, the median time for the single troponin test was 54 min (IQR 33–85) after presentation to the emergency department. In systems that support very early blood sampling in the emergency department, the threshold of 5 ng/L might not have such a high negative predictive value. In addition, although early presenters represent only a small proportion of all patients (5%), the use of the single troponin test value failed to meet the predefined negative predictive value of 99.5% in these patients, and serial testing should continue in such patients.

Additionally, there are important considerations relating to troponin assays when interpreting (and considering implementation of) the findings of this study. First, all troponin assays are different, and the cutoff and findings described by Shah and colleagues are specific to the troponin assay that they used. These do not apply to any other assays, even other high-sensitivity assays.

Second, high-sensitivity cardiac troponin assays provide improved analytical precision at low threshold had a negative predictive value of 99.6% (95% CI 99.4–99.9). The results were validated in two cohorts of 1434 patients presenting to emergency departments with similar positive findings (overall negative predictive value 99.4%, 95% CI 98.8–99.9). The negative predictive value, although an accepted method of evaluating screening tests of exclusion, is affected by disease prevalence, and this should be considered in different emergency department populations.

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Second, high-sensitivity cardiac troponin assays provide improved analytical precision at low
concentrations of troponin compared with previous generations. Clinicians should be aware that results are usually less reliable at troponin concentrations lower than at the 99th percentile. To be classified as high sensitivity, an assay must have a coefficient of variation of at least 10% at the 99th percentile for the assay. When considering local implementation of this diagnostic strategy, the assay’s precision should be discussed by the laboratory and clinicians (eg, specialists in emergency medicine, cardiology, and internal medicine) with an assessment made about the ability to maintain acceptable precision. Reassuringly, in this study, the interlaboratory precision across 33 instruments at 3.5 ng/L was good, suggesting that the accuracy of this assay in clinical practice might be reliable. The ultimate validation for the safety and efficacy of discharging patients with cardiac troponin concentrations less than 5 ng/L will be the report of clinical outcomes after this threshold is implemented in routine clinical practice.

Finally, what further assessment, if any, is needed for those patients identified as low risk and suitable for early discharge? Trials are needed to assess the safety and effectiveness of clinical pathways that involve no further testing for such patients.

Shah and colleagues’ study is a huge advance in the assessment of patients with possible acute coronary syndrome in emergency departments. We strongly urge close collaboration between front-line clinicians and their laboratory colleagues to identify optimum assessment strategies, including consideration of troponin assay availability and reliability, before local implementation.

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Is it time for treat to target in psoriatic arthritis?

With the emergence of effective treatments for inflammatory arthritis, the new concept of treat to target has evolved. Treat to target is defined as “a treatment strategy in which the clinician treats the patient aggressively enough to reach and maintain explicitly specified and sequentially measured goals, such as remission or low disease activity”. A proactive clear endpoint, which is the aim of the treatment, should be used as a specific target algorithm. This endpoint should be supported by findings from randomised controlled trials which suggest that early aggressive treatment approaches are advantageous. In rheumatoid arthritis, this treatment approach has been proven to be effective in the Tight Control of Rheumatoid Arthritis (TICORA) trial. Indeed, an international task force has now published treat-to-target recommendations for rheumatoid arthritis.

In psoriatic arthritis—an inflammatory musculoskeletal disease associated with psoriasis—ascertainment of the treatment target has been more