

## Cardiac Marker Point-of-care Testing: Evaluation of Rapid On-site Biochemical Marker Analysis for Diagnosis of Acute Myocardial Infarction

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### Abstract

**Introduction:** Up to 40% of patients with acute myocardial infarction (AMI) present with non-diagnostic electrocardiograms (ECGs). The diagnosis in such cases is usually made with the aid of biochemical markers. Newer and more rapid assays for such markers have now enabled testing to be done on-site instead of in the laboratory. This potentially enables the clinician to rapidly diagnose and triage patients. We evaluated the diagnostic precision of this point-of-care testing strategy using one such analyser, the Stratus CS (Dade Behring) in a prospective study. **Materials and Methods:** The study population consisted of 51 consecutive patients admitted for suspected AMI with non-diagnostic ECGs. Two blood samples from each patient were drawn simultaneously on admission. The first sample was assayed for myoglobin, troponin I (TnI) and creatine kinase-MB (CKMB) mass by the point-of-care instrument (Stratus CS), and the second sample was sent for standard testing for AMI, comprising a troponin-T (TnT) qualitative test and the analysis of CKMB by the hospital laboratory. Utilising the recommended cut-off values for the individual assays, the results of these 2 sets of tests were evaluated based on whether they were positive or negative for AMI and compared against the patient's final diagnosis at discharge. Various combinations of markers were assessed. **Results:** On evaluation of individual markers, myoglobin was the most sensitive (75%) at 0 to 6 hours after onset of symptoms, while TnI (95%), TnT (80%) and CKMB-mass (90%) performed better at 7 to 12 hours. Point-of-care testing utilising a combination of markers was highly sensitive and specific. Both dual-marker panels of myoglobin with TnI and myoglobin with CKMB-mass yielded equivalent overall sensitivities and specificities of 90% and 95% respectively. A triple-marker panel of myoglobin, TnI and CKMB-mass had a sensitivity of 93% and specificity of 95%. All point-of-care testing panels had good positive and negative predictive values, and showed comparable diagnostic efficacy with the standard testing presently utilised for the diagnosis of AMI. The average time for results to become available was up to 26 minutes for point-of-care testing and 65 minutes for standard testing. **Conclusion:** Point-of-care testing utilising a panel of 2 or 3 cardiac markers has comparable diagnostic precision to the presently utilised testing strategy for AMI, with earlier availability of results.

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**Key words:** Acute myocardial infarction, Creatine kinase MB, Myoglobin, Point-of-care testing, Troponin

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