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Prospective validation of the 2015 ESC 0-hour/1-hour algorithm using high-sensitivity cardiac troponin T in Asian countries

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Background/Introduction: Implementation of the 2015 ESC 0-hour/1-hour algorithm using high-sensitivity troponin (hs-cTn) T in Asian countries presents a challenge for clinical practice.
Purpose: We aimed to prospectively validate the 0-hour/1-hour algorithm in Asian countries.
Methods: We conducted a prospective, multi-center, international cohort already utilizing 0-hour/1-hour algorithm using hs-cTnT for evaluation of patients with suspected of non-ST elevation acute coronary syndrome (NSTE-ACS). All patients underwent a clinical assessment the included medical history, physical examination, 12-lead ECG, continuous ECG monitoring, pulse oximetry, standard blood test, chest radiography, cardiac and abdominal ultrasonography. Patients presenting with congestive heart failure, terminal kidney disease on hemodialysis state, arrhythmia, or infection disease (which cause to increase troponin level) were excluded. Patients were divided into three groups according to the algorithm: hs-cTnT below 12 ng/L and delta 1 hour below 3 ng/L were the "rule out" group; hs-cTnT at least 52 ng/L or delta 1 hour at least 5 ng/L were in the "rule in" group; the remaining patients were classified as the "observational" group. The final diagnosis was then adjudicated by 2 independent cardiologists using all available information, including coronary angiography, coronary computed tomography, stress electrocardiography and follow-up data. The presence of acute myocardial infarction (AMI) was defined according to the Fourth Universal Definition of Myocardial Infarction.
Results: Of the 1,332 patients enrolled in 2014 to 2018, 933 patients were analyzed after exclusion. AMI was the final diagnosis for 122 (13.1%) patients. The algorithm ruled out AMI in 401 patients with a negative predictive value and sensitivity of 100% (95% confidential interval [CI], 98.6%-100%) and 100% (95% CI, 94.0%-100%), respectively, in the rule-out group. None of the patients were diagnosed with AMI. Among the 211 patients classified into the rule-in group, 90 were diagnosed as having AMI. The positive predictive value and specificity were 43.1% (95% CI, 36.2%-50.2%) and 78.3% (95% CI, 74.5%-81.7%), respectively. The median length of hospital stay was 159 min (142–180) in rule out group.
Conclusion(s): Our findings suggest that the 0-hour/1-hour algorithm using hs-cTnT provides very high safety and efficacy for the triage toward rapid rule-out to rule-in of AMI.