

External validation of a suggested extension of the ESC 0/1h-algorithm for early rule out of myocardial infarction

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Background: The European Society of Cardiology (ESC) high sensitivity cardiac troponin T 0/1h-algorithm has substantially improved the management of patients with suspected acute myocardial infarction (AMI) by triaging about 75% of patients to rapid rule-out and/or rapid rule-in. However, about 25% of patients remain in the “observe-zone”, and the optimal management of these patients is unknown. Recently, a pilot single center study with a low prevalence of AMI suggested that an absolute change of less than 7ng/L between the 0h and 3h hs-cTnT concentration would allow to help in the evaluation of patients in the observe-zone and allow triage towards rule-out with very high negative predictive value [NPV].

Purpose: To externally validate this suggested modification of the ESC 0/1h-algorithm for early rule out of AMI.

Methods: In an ongoing multicentre international study, we prospectively enrolled unselected patients presenting to the emergency department with symptoms suggestive of MI. Final diagnoses were centrally adjudicated by two independent cardiologists using all available medical records obtained during clinical care including 90 day follow-up information and car-

diac imaging. High sensitivity-cTnT (Elecsys) concentrations were measured at presentation and after 1 and 3 hours. The primary outcome was safety, quantified by the sensitivity and NPV for early rule out of NSTEMI.

Results: Among 1633 enrolled patients with available 0, 1 and 3h hs-cTnT concentrations, NSTEMI was the adjudicated final diagnosis in 337 (20.6%) patients. The ESC 0/1h-algorithm ruled out 918 (56.2%) patients, with a sensitivity of 98.8% (95% confidence interval [CI], 97.0–99.5) and a NPV of 99.6% (95% CI, 98.9–99.8). A total of 428 patients (26.2%) remained in the observe zone. After applying the suggested 0–3 hour absolute change cut-off criteria of 7ng/L, 393 (92.0%) additional patients from the observe zone were triaged towards ruled out. However, the safety of this triage step was poor with 62 patients with NSTEMI missed, resulting in a sensitivity of 33.3% and a NPV of 84.2% for rule-out.

Conclusions: The suggested 0/3h absolute change cut-off of 7ng/L for patients remaining in the observe zone of the ESC 0/1h-algorithm does NOT allow safe rule-out of AMI and should therefore NOT be implemented into routine clinical care.

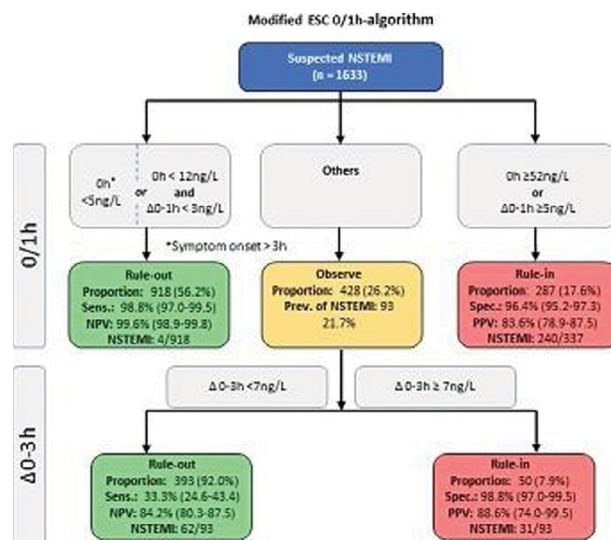


Figure 1