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RAPID-CPU: a prospective study on implementation of the ESC 0/1-hour algorithm and safety of discharge after rule-out of myocardial infarction

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would have been missed by a conventional sensitive and probably also by a contemporary sensitive cardiac troponin assay. Consistently, only two of the five patients with theoretically missed MI underwent PCI and there were no mortality events at 30 days among these five patients.

Additional information on outcomes, diagnostic rules, timing of coronary angiography, rates of revascularisation are provided in Supplementary Table 4.

Discussion

There is a striking contrast between the excellent diagnostic performance of fast protocols,[2–11] the consistent findings for lower observation times in the ED,[8,19,21] relevant cost savings[26–29] and the limited adoption of fast diagnostic protocols despite an urgent need to decongest crowded EDs.[12,30] Uncertainties that reduce the enthusiasm of physicians to implement single biomarker or accelerated protocols are mostly driven by the fear of litigation in case of missed MI or death.[13] Previously, warnings were expressed that clinicians should apply the 1-hour algorithm with caution and only in low-risk patients,[14,15] and that decisions should rather be based on rising or falling patterns of troponin than on single cut-off values.[14] In support of the former, 2014 American College of Cardiology (ACC)/American Heart Association (AHA) guidelines[16] cautioned against early troponin testing

by the paucity of evidence from randomised trials evaluating the safety of discharge using accelerated protocols and hsTn assays, as well as issues to extrapolate findings derived from observational studies that enrolled patients with higher pretest probabilities for an ACS. Currently, most evidence from randomised trials has focused on the implementation of hsTn in combination with validated clinical scores,[18,19] a dual biomarker strategy combining copeptin with cardiac troponin,[8] or a discharge of low-risk patients based on a normal hsTnI measurement 2 hours apart, together with a normal ECG and either a TIMI score of 1 point or less,[9,10,21] or a low EDACS score.[20] A large pre and post-implementation study on 31,332 patients with suspected ACS demonstrated a reduced LoS and increased proportions of patients discharged from the ED within 6 hours, without an adverse event when clinical pathways were correctly applied.[21]

The data from this large study confirm previous observations and add information on feasibility, efficacy and safety of discharge using the ESC 0/3-hour but most importantly the ESC 0/1-hour rule-out protocols in an all-comers registry with broad inclusion criteria. The study provides several important findings.

First, our findings suggest that the ESC recommended 0/1-hour algorithm can be implemented as the predominant diagnostic algorithm, and is clinically feasible. Second, discharge after rule-out is safe with or without the use of

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