Publication

0/1-Hour Triage Algorithm for Myocardial Infarction in Patients With Renal Dysfunction

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The European Society of Cardiology recommends a 0/1-hour algorithm for rapid rule-out and rule-in of non-ST-segment elevation myocardial infarction using high-sensitivity cardiac troponin (hs-cTn) concentrations irrespective of renal function. Because patients with renal dysfunction (RD) frequently present with increased hs-cTn concentrations even in the absence of non-ST-segment elevation myocardial infarction, concern has been raised regarding the performance of the 0/1-hour algorithm in RD.; In a prospective multicenter diagnostic study enrolling unselected patients presenting with suspected non-ST-segment elevation myocardial infarction to the emergency department, we assessed the diagnostic performance of the European Society of Cardiology 0/1-hour algorithm using hs-cTnT and hs-cTnI in patients with RD, defined as an estimated glomerular filtration rate <60 mL/min/1.73 m; 2; , and compared it to patients with normal renal function. The final diagnosis was centrally adjudicated by 2 independent cardiologists using all available information, including cardiac imaging. Safety was quantified as sensitivity in the rule-out zone, accuracy as the specificity in the rule-in zone, and efficacy as the proportion of the overall cohort assigned to either rule-out or rule-in based on the 0- and 1-hour sample.; Among 3254 patients, RD was present in 487 patients (15%). The prevalence of non-ST-segment elevation myocardial infarction was substantially higher in patients with RD compared with patients with normal renal function (31% versus 13%,; P; <0.001). Using hs-cTnT, patients with RD had comparable sensitivity of rule-out (100.0% [95% confidence interval {CI}, 97.6-100.0] versus 99.2% [95% CI, 97.6-99.8];; P; =0.559), lower specificity of rule-in (88.7% [95% CI, 84.8-91.9] versus 96.5% [95% CI, 95.7-97.2];; P; <0.001), and lower overall efficacy (51% versus 81%,; P; <0.001), mainly driven by a much lower percentage of patients eligible for rule-out (18% versus 68%,; P; <0.001) compared with patients with normal renal function. Using hs-cTnI, patients with RD had comparable sensitivity of rule-out (98.6% [95% CI, 95.0-99.8] ver-

sus 98.5% [95% CI, 96.5-99.5];; P; =1.0), lower specificity of rule-in (84.4% [95% CI, 79.9-88.3] versus 91.7% [95% CI, 90.5-92.9];; P; <0.001), and lower overall efficacy (54% versus 76%,; P; <0.001; proportion ruled out, 18% versus 58%,; P; <0.001) compared with patients with normal renal function.; In patients with RD, the safety of the European Society of Cardiology 0/1-hour algorithm is high, but specificity of rule-in and overall efficacy are decreased. Modifications of the rule-in and rule-out thresholds did not improve the safety or overall efficacy of the 0/1-hour algorithm.; URL: https://www.clinicaltrials.gov. Unique identifier: NCT00470587.
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