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Ideal high sensitivity troponin baseline cutoff for patients with renal dysfunction

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We thank the readers for the opportunity to respond. In particular, although high sensitivity troponin assays retain high sensitivity (low rate of false negatives) the more problematic scenario occurs when an ED patient has a baseline elevated level of troponin. Although patients with renal dysfunction have a higher rate of elevated troponin levels (even in the absence of myocardial ischemia) they also have higher risk for acute coronary syndrome (ACS) and often have demographic or comorbidities (age, race, diabetes mellitus) associated with atypical ACS presentations. Additionally, the risk of cardiac catheterization is thought to be higher in patients with renal dysfunction due to contrast-induced nephropathy. Thus, proper interpretation of high-sensitivity troponin values in patients with renal dysfunction is a both challenging and important problem.

The letter authors are correct to point out that patients with chronic kidney disease are at high risk for coronary artery disease and ACS and that improved sensitivity and specificity of troponin assays would be valuable. We also agree that this study should be replicated by the manufacturers of different high-sensitivity troponin assays in order to determine if there is broader generalizability of renal function-adjusted cutoffs for high-sensitivity troponin assays. Furthermore, at the time of this writing, the authors are also correct in asserting that most US EDs have not yet implemented high sensitivity assays, let alone the Siemens Atellica high-sensitivity cardiac troponin I assay specifically. In 2020, it is estimated that about 5–10% of cTn measurements in the USA were with hs-cTn assays. We do note in our Limitations section: "Last, our proposed alteration to baseline cutoff has only been studied using a hs-cTnI assay. However, we believe this hypothesis generating work can spur future prospective study, which can further delineate the impact on patient-oriented outcomes."[1]

The purpose of this study was to demonstrate proof of principle that adjusting high-sensitivity troponin cutoffs for renal function could have value. We look forward to future work by our group and others further evaluating this approach to improving the performance of our diagnostic tests for ACS.

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Statement of author contributions

Alexander T. Limkakeng Jr. Conceptualization, Investigation, Methodology, Project Administration, Visualization, Roles/Writing - original draft.

Julian Hertz Roles/Writing - original draft, Writing - review & editing.

Reginald Lerebours Formal analysis, Data curation Validation; Visualization.

Maragatha Kuchibhatla Formal analysis Supervision; Validation; Visualization.

James McCord; Investigation, Methodology, Writing - review & editing.

Adam J. Singer; Investigation, Methodology, Writing - review & editing.

Fred S. Apple; Investigation, Methodology, Writing - review & editing.

William F. Peacock; Investigation, Methodology, Writing - review & editing Robert H. Christenson; Investigation, Methodology, Writing - review & editing Richard M. Nowak; Investigation, Funding acquisition, Methodology, Project administration, Resources, Supervision, Writing - review & editing.

Declaration of Competing Interest

Dr. Limkakeng reports receiving grant funding from Roche Diagnostics, Abbott Laboratories, Siemens Healthineers, Bristol-Myers Squibb, Ischemia Care, LTD, and GE AstraZeneca; and serving as a consultant for BioMérieux and ZS Pharma. Dr. Hertz has received research support from Roche Diagnostics and Abbott Laboratories. Dr. McCord has received research support from Roche, Siemens Healthineers, Abbott, and Beckman Coulter and has served as a consultant for Roche and Siemens Healthineers. Dr. Singer reports serving as a consultant for Jansen, Pfizer, BNS, and AstraZeneca. Dr. Apple reports serving on the board of directors for HyTest Ltd. and the advisory board for Siemens Healthcare and Instrumentation Laboratory. He reports serving as a consultant for LumiraDx; he has served as a nonsalaried principle investigator through Hennepin Healthcare Research Institute for Abbott Diagnostics, Abbott Point of Care, Roche Diagnostics, Siemens Healthcare, Quidel/Alere, Ortho Clinical Diagnostics, and Beckman Coulter. He reports serving as an associate editor for Clinical Chemistry. Dr. Peacock reports receiving research grants from Abbott, BrainCheck, ImmunArray, Janssen, Ortho Clinical Diagnostics, Relypsa, and Roche; serving as a consultant for Abbott, AstraZeneca, Bayer, Beckman, Boehringer Ingelheim, Ischemia Care, Dx, ImmunArray, Instrument Labs, Janssen, Nabriva Therapeutics, Ortho Clinical Diagnostics, Relypsa, Roche, Quidel, and Siemens Healthineers; and providing expert testimony for Johnson & Johnson. He also reports stock/ownership interests in AseptiScope Inc., Brainbox Inc., Comprehensive Research Association LLC, Emergencies in Medicine

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[1] Limkakeng Jr Alexander, et al. Ideal high sensitivity troponin baseline cutoff for patients with renal dysfunction. American Journal of Emergency Medicine. 2021;47:170–5. https://doi.org/10.1016/j.ajem.2020.06.072.

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