A DIGITAL TOOL AND PORTAL FOR EDUCATING CLINICIANS ON EVIDENCE-BASED TROPONIN INTERPRETATION IN ACUTE CORONARY SYNDROME

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Background

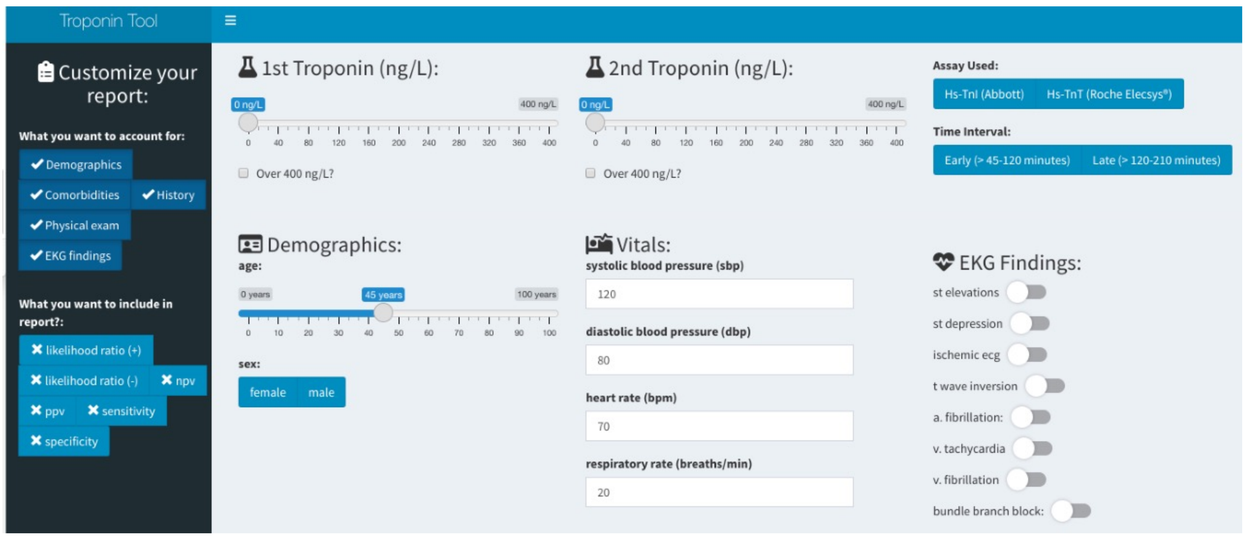
- Serum troponins are widely used in inpatient medicine to assist in the detection of acute coronary syndrome (ACS). However, serum troponins are widely overordered, performed in 47% of inpatients, including 35% of inpatients without anginal symptoms.[1]
- Mild elevations in serum troponin, when ordered in asymptomatic patients, can lead to unnecessary testing, preventable radiation exposure, and financial harm to patients who do not have anginal symptoms. Continuing clinician education in serum troponin is warranted.[2]
- Digital tools at the point of care have the potential to improve understanding and interpretation of elevated serum troponins, and are underutilized.

Methods

- We designed a new interactive educational tool in which clinicians can input physical exam findings, history of present illness features, electrocardiogram features, comorbidities, and each combination of serum troponin. The tool, programmed in R/Shiny, generates an evidence-based statement incorporating the positive and negative likelihood ratios (LR+/LR-), positive and negative predictive values (PPV/NPV), and sensitivities and specificities of these features.[3,4]
- Each module of the tool connects to original written and illustrated material on an educational portal to educate clinicians on conditional probability and troponin interpretation in special populations (e.g. patients with transplant, immunotherapy use, or kidney failure).
- The impact of the interactive tool and educational portal were evaluated by surveys with Likert scales, distributed to clinicians at YNHH, completed before and after review of troponin educational material. Pre- and post- distributions were compared with Mann-Whitney U tests, with two-tailed alpha<0.05 for significance. Study IRB# 2000035035.

We hypothesized that use of this interactive tool and educational portal will improve clinician confidence and comfort in interpretation of troponin elevations in myocardial injury.

Figure 1. User interface of novel troponin interpretation tool programmed by our team



Results

Figure 2. Demographics of study participants.

40 participants

At YNHH York Street Campus (New Haven, CT)

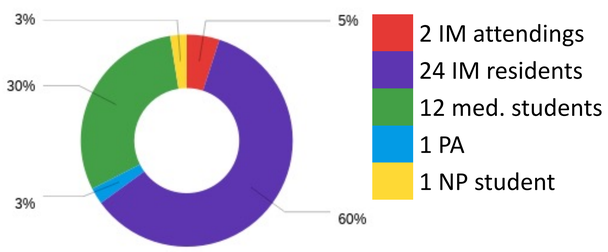
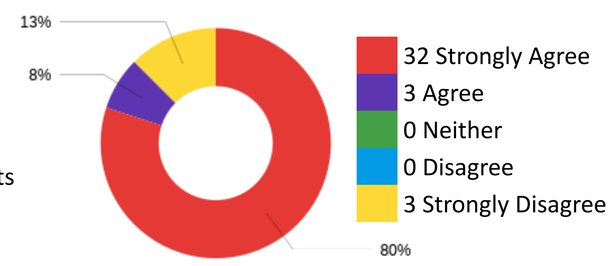


Figure 3. Responses to: "I learned something new from the troponin educational material."



Results

Figure 4. Responses to: "I am able to provide definitions to distinguish the following terms."

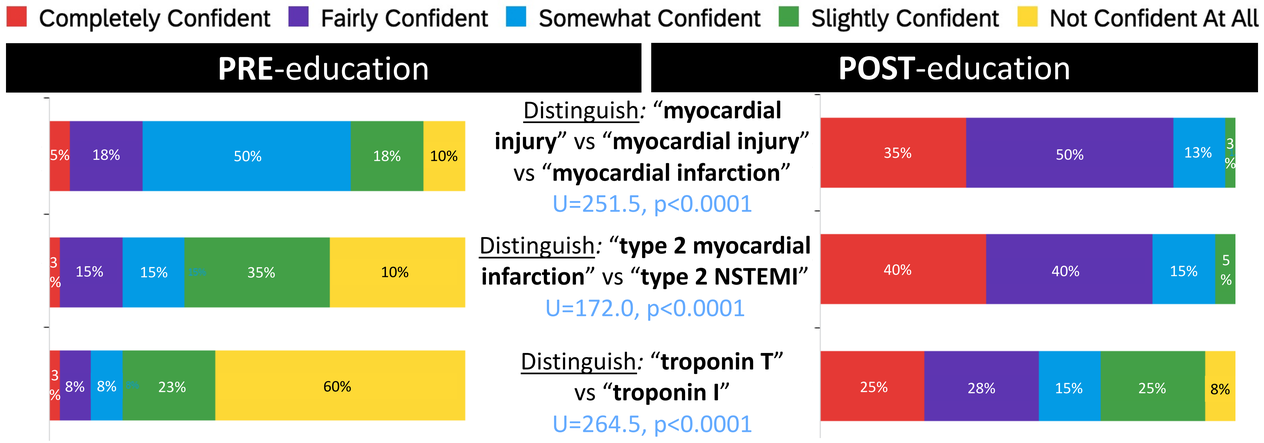
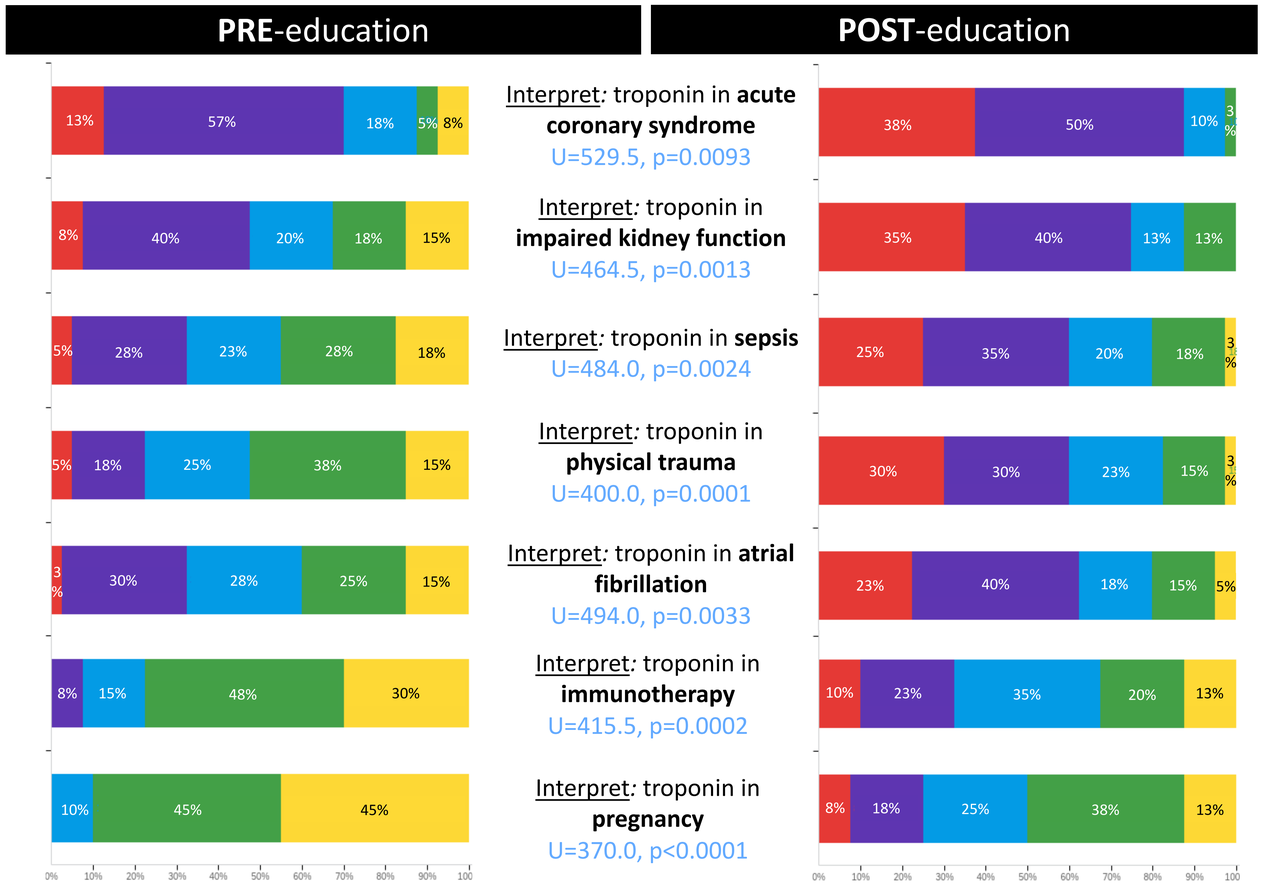


Figure 5. Responses to: "My comfort in interpreting troponin in patients with the following conditions is"



Discussion & Conclusion

- Our novel digital consult tool and educational portal show promise in improving clinician confidence and comfort in interpreting serum troponin in myocardial injury.
- Improving clinician awareness/education may help reduce unnecessary testing for patients downstream, which should be evaluated as long-term outcomes.
- This approach may be useful to medical educators in other specialties hoping to create digital tools to integrate diagnostic test performance measures into point-of-care clinical decision-making.

References

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