Effect of High Sensitivity Troponin Assay on Hospital Resources and Emergency Department Discharges In Patients Presenting With Symptoms Concerning for Myocardial Infarction

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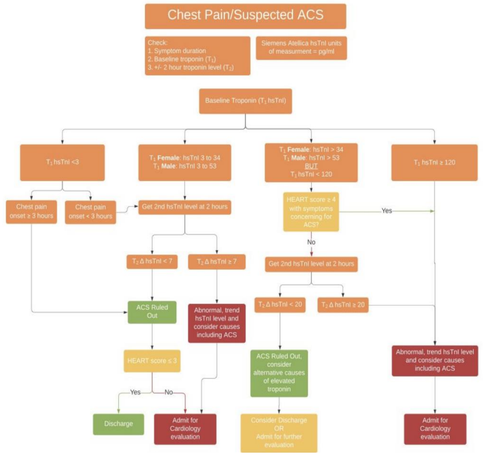
Background

The high-sensitivity troponin assay was initially approved for use in the United States in 2017 and is most recently recommended by the 2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain for detection of acute myocardial infarction. Various protocols have been developed to “rule out” myocardial infarction through screening patients in an Emergency Department (ED). The HISTORIC trial demonstrated reduced length of stay and hospital admission by using a high-sensitivity assay, with an increase in the ED discharge rates from 53% to 74% [2]. However, in the past, these protocols were not applied to an all-comers population that might include patients with congestive heart failure, end-stage renal disease, elderly patients, and more critically ill patients.

In May of 2022, HCA Florida Orange Park Hospital switched completely from the old sensitivity assay to the Siemens Atellica high-sensitivity troponin assay



Objective

Evaluate implementation of high sensitivity troponin assay protocol for patients presenting with chest pain, and the downstream effects on disposition (emergency department discharge vs. admission), and the utilization of hospital resources.

Methods

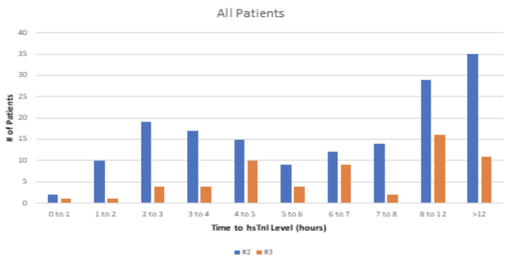
This quality improvement project was conducted as a retrospective chart review using a convenience sample of patients who presented with chest pain to our 120,000 visit/year community emergency department at HCA Florida Orange Park Hospital. Dates included the months of February 2022 (pre-algorithm) and July 2022 (post-algorithm). Inclusion criteria included patients presenting to ED with symptoms concerning for myocardial infarction, and a primary diagnosis of “chest pain” or form of anginal equivalent. Access was obtained to patient records to collect pertinent information for study variables, including baseline demographics, time between troponin level.

Primary outcome measure: adherence to high sensitivity troponin assay guidelines

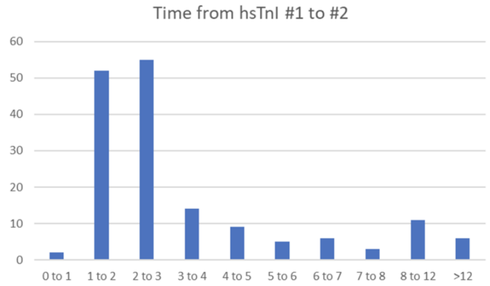
Secondary outcome measure: the downstream effects of guideline non-adherence on patient disposition and hospital resources

Results

Pre-algorithm



1 month post implementation of algorithm



Discussion

Initial data analysis suggested non-adherence to appropriate use of high-sensitivity troponin assay was low. Only 18% of patients presenting to ED with a primary diagnosis of chest pain had 2nd high sensitivity troponin obtained within 1-3 hours. Single level rule out was not utilized appropriately, as a significant number of patients had detectable level above the lower limit of detection and myocardial infarction was not ruled out.

With the new assay, more females than males were tested (60% vs 40%). Nicotine, hyperlipidemia, and primary hypertension remained the highest comorbidities. Aside from echocardiograms, all other forms of provocative testing decreased for inpatient acute coronary syndrome evaluation. Pre-algorithm length of stay averaged at 20 days vs. post-algorithm at 23 days.

Initial data collected was analyzed using descriptive statistics, however, chi-square test for significance of categorical variables was unable to be performed with initial data collected. Hence, the above mentioned baseline data was not able to be determined statistically significant.

Conclusion

Our future goals include obtaining additional data from the period of June-December 2022. Doing so will increase our sample size, and determine whether or not our findings are statistically significant.

We will continue to compare ED discharge vs. admission rates of chest pain patients and, in conjunction, trend guideline non-adherence of high sensitivity troponin assay over time.

We aim to use this future data to help promote awareness, and inform future research questions and prospective studies.

References

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