INTRODUCTION

Objective: To determine the diagnostic effectiveness of hs-troponin assays compared to conventional assays in patients who present with myocardial infarction symptoms.

Background:
- In the United States, myocardial infarction (MI) impacts 735,000 people annually.
- Survival depends on early recognition and intervention to restore blood flow.
- Conventional troponin assays have been vastly used, but lack in their low sensitivities. Their effectiveness is being used as serial markers, which increases their ability to recognize serum protein levels as time goes on.
- This limits their use in early recognition of myocardial ischemia, which directly impacts the amount of tissue damage being accrued and impacts patient survival.
- High-sensitive troponin assays are becoming more available, which aim to identify lower levels of serum troponin earlier in the disease process of an acute event, which implies their use can more accurately identify an MI in the patient presents with symptoms.
- Determining their effectiveness in a clinical setting can be achieved by comparing their performance to conventional troponin assays.
- Comparison should enlighten whether they alone can more be effective in the standard work-up of a patient presenting with MI symptoms or if their high-sensitivity leads to more patients being diagnosed falsely.

Clinical Question: Among adults who present to the emergency department with chest pain, does the use of high sensitivity troponin assay provide an earlier diagnosis of acute myocardial infarction and can it provide better clinical outcomes compared to conventional assays?

METHODS

Records identified through database searching
PubMed, Cochrane, UpToDate
Google Scholar

Records after duplicates removed (n = 3034)

Records screened (n = 45)

Records excluded (n = 34)

Full-text articles assessed for eligibility (n = 9)

Studies included in systematic review (n = 3)

Search terms: *hs-troponin*, "conventional troponin vs. hs-troponin", "hs-troponin + cardiac biomarker" + acute MI

RESULTS

Overview of Results from Studies

<table>
<thead>
<tr>
<th>Patients (n)</th>
<th>Hecht et al. (Prospective)</th>
<th>Chew et al. (NCT)</th>
<th>Al-Saleh et al. (Meta-Analysis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>718</td>
<td>1,997</td>
<td>9,186</td>
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- Population age: 68 (31-72) vs. 61 (48-74)
- Gender: Men 69% Women 31% Men 59% Women 41%
- C-Troponin assay: Std (Beecher Troponin T) vs. Std (Beecher Troponin T)
- Hs-Troponin assay: 4 sensitive assays vs. 1 sensitive assay (Beecher Troponin T)
- Sensitivity: 93% Specificity: 74%

CONCLUSIONS

Findings confirm that high sensitive troponin assays do have an increased sensitivity compared to conventional assays; however, the tradeoff with a hs-troponin assay is that specificity is lower than c-troponin assay. It was also discovered that high sensitive assays were equivalent to conventional assays when used as serial markers. This implies their use may only be beneficial in the early hours of MI symptoms. Finally, all the studies reviewed, measured high sensitive troponins after the diagnosis of MI was made or ruled-out. Rechlin et al. looked at both initial presentation and serial monitoring of both assays and is referenced in other articles analyzing the effectiveness of hs-troponin assays. While the population sample was smaller than the other studies, Rechlin et al. is the article that provided a direct comparison between the two types of assays and therefore is the most applicable to our clinical question. In order to truly determine if these high sensitive assays are more effective in diagnosing an MI they need to be used in trials where they are the main modality used in the diagnosis process.

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REFERENCES