Does an elevated troponin ultimately matter? An assessment of outcomes in patients presenting to the emergency department with non-cardiac complaints

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ABSTRACT

Background: Acute coronary syndrome (ACS) is one of the most time-sensitive diagnoses made in the emergency department (ED). Troponin (TNI) measurement is an invaluable tool; however, its utility is often limited by the clinical context and is false positive in the setting where there is a strong pre-test probability. Studies show that most TNI elevations are due to non-cardiovascular causes, however, elevated TNI has been associated with increased morbidity and mortality, often prompting additional investigations.

Objective: The purpose of our study was to evaluate patients who presented to the ED with non-cardiac complaints but elevated TNI and to investigate if there was any difference in one-year outcomes (cardiovascular, ST elevation myocardial infarction (STEMI), non-STEMI, stroke or transient ischemic attack (TIA)), revascularization, hospitalization for cardiac cause or death) between those who underwent cardiac evaluation (consultation and/or testing) and those who did not.

Methods: We conducted a retrospective chart review of patients ≥18 assessed in the ED for non-cardiac complaints with a high TNI from January 1, 2016 to June 30, 2016. In total, 1499 patients were analyzed and stratified into three groups: Group 1) patients with no further evaluation for ischemia or cardiology consultation (n=513), Group 2) patients where only consultation was requested (n=81) and Group 3) patients who underwent further cardiac evaluation (consultation and/or testing) and those who did not. Overall, i)

HYPOTHESES

1. Unrestricted or indiscriminate ordering of cardiac troponin levels in the ED for non-cardiac presenting complaints leads to further unnecessary investigation.

2. Restricting the ordering of troponin for non-cardiac complaints to physicians in the ED rather than automatically at triage would reduce further unnecessary investigation.

RESULTS

・Methodology is summarized in Figure 1 to the left.

・We conducted a retrospective chart review for patients ≥18 seen in the ED with an elevated initial troponin from January 1 - June 30, 2016.

・Elevated or positive troponin was defined as Troponin I of >0.045ug/L.

・Patients presenting with cardiac complaints including chest pain, palpitations, syncope, shortness of breath or cardiac arrest were excluded.

・Patients without cardiac complaints were stratified into 3 groups:
  1) patients who had no further work-up for their elevated troponin and
  2) patients who underwent cardiology consultation only (inpatient or outpatient). These were further divided into 3 subgroups:
   Group 1: no further diagnostic testing for ischemia or cardiac disease
   Group 2: cardiology consultation only
   Group 3: further diagnostic testing for ischemia or cardiac disease

・No further work-up for cardiac disease

・Data was collected on major adverse cardiac events within 1-year of follow up.

DISCUSSION

・Overall, in patients with isolated elevated TNI and non-cardiac complaints, our data showed no difference in mortality or cardiac event rates between those who had further testing and/or cardiac consultations and those who did not.

・TNI ordering could be cautiously limited to patients who had further testing and/or cardiac consultations and those who did not.

METHODS

OBJECTIVE

To assess the outcomes of patients with non-cardiac presentations who have elevated troponin levels in the ED.

RESULTS

Table 1. Comparison of Cardiac Outcomes

<table>
<thead>
<tr>
<th>Cardiac Outcomes</th>
<th>No further diagnostic testing (N=1,552)</th>
<th>Cardiology consultation only (N=153)</th>
<th>Further diagnostic testing (N=297)</th>
<th>P-value of proportions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unstable Angina</td>
<td>2.0 (0.2%)</td>
<td>1.0 (0.3%)</td>
<td>0.0 (0.0%)</td>
<td>0.776</td>
</tr>
<tr>
<td>STEMI</td>
<td>11.1 (0.7%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
<td>0.325</td>
</tr>
<tr>
<td>NSTEMI</td>
<td>15.3 (1.5%)</td>
<td>2.0 (0.3%)</td>
<td>0 (0.0%)</td>
<td>0.869</td>
</tr>
<tr>
<td>Stroke/TIA</td>
<td>16 (1.4%)</td>
<td>4 (0.5%)</td>
<td>0 (0.0%)</td>
<td>0.560</td>
</tr>
<tr>
<td>Revascularization</td>
<td>11 (0.7%)</td>
<td>2.0 (0.3%)</td>
<td>0 (0.0%)</td>
<td>0.171</td>
</tr>
<tr>
<td>Cardiac Hospitalization</td>
<td>20 (1.3%)</td>
<td>1.2 (0.2%)</td>
<td>0 (0.0%)</td>
<td>0.476</td>
</tr>
<tr>
<td>Death</td>
<td>241 (12.3%)</td>
<td>10 (13.2%)</td>
<td>59 (20.0%)</td>
<td>0.157</td>
</tr>
</tbody>
</table>

REFERENCES

2. Worrall, Andrew D. "Cardiac biomarkers: clinical implications and cost of care comparison with other cardiac tests in the evaluation of patients with suspected acute coronary syndrome." Journal of Cardiac Failure 11 (2005): 253–263.