Tests I Wish You Had Not Ordered

Scott Girard D.O. FACOI

Hospitalist

Disclosure Information

OMED, Tests I wish You Had Not Ordered

- **I have no financial relationships to disclose.**
- **I will not discuss off label use or investigational use in my presentation.**

ACOI 75

75 YEARS OF DEDICATION TO OUR MEMBERS

Scott Girard D.O. FACOI
Charlotte, N.C.

Disclosures

- None
- No company or person has decided to pay me to be here, give this talk, or want me to represent them in any way.

Who am I?

- Hospitalist
- Worked for the past 10 years as a Hospitalist, Director and Nocturnist.
- Not a specialist
- Honored to be on the ACOI's Board of Directors

- No affiliations to any companies (drug,lab,etc)

Community Hospitalist

- No residents to worry about ordering strange tests
- Surgeons do not know how to order tests (a good thing)
- So, my nemesis? The ED Doc!!!

Courtesy of the NY times

How it all went down

- Called for an admission while working nights.
- 73 year old woman presented from home.
- History of HTN, Hyperlipidemia, and DMII controlled with oral medications
- Had never been admitted to the hospital before.

Actual Clinical Case

- There was a small kitchen fire in here home. She was no where near the flames, no smoke inhalation, carbon monoxide levels were normal.
- She was obviously distraught/anxious
- She came to the Hospital for safety
- No physical complaints (Chest pain, wheezing, shortness of breath, etc)

ED Doctor felt the need to do work

- Ordered labs, CXR, EKG (mostly driven by a protocol, that is another issue altogether)

- Everything normal except for…….

The Test

- The Troponin – I

- It was elevated to 0.046
  - Normal range 0-0.040

  - Called me to admit the patient for an MI

My Question

- Why did you even order a Troponin?

- Answer……

It was easy!!!!!!!!

Results I hate (and wish were never ordered)

- Troponin I of 0.05 and no cardiac symptoms

- Troponin I of 0.13 with a creatinine of 2.4 and vague chest complaints

Clinical Significance of Elevated Troponins

- 3rd Generation Troponin tests can detect troponin values in 95% of a reference ("normal/healthy patient" group)

- The 4th Generation can detect a troponin in 99% of the "normal" reference group

A “Positive” Troponin

- The standard for a “positive” is starting to be universal
- 99th percentile of the upper reference limit.
- In the current generation (4th generation), this allows for a high false positive rate, but helps with detection of structural cardiac abnormalities as well as any source of myocardial necrosis.

Ultra-sensitive

- Being used in Europe and now starting to be common in the US.

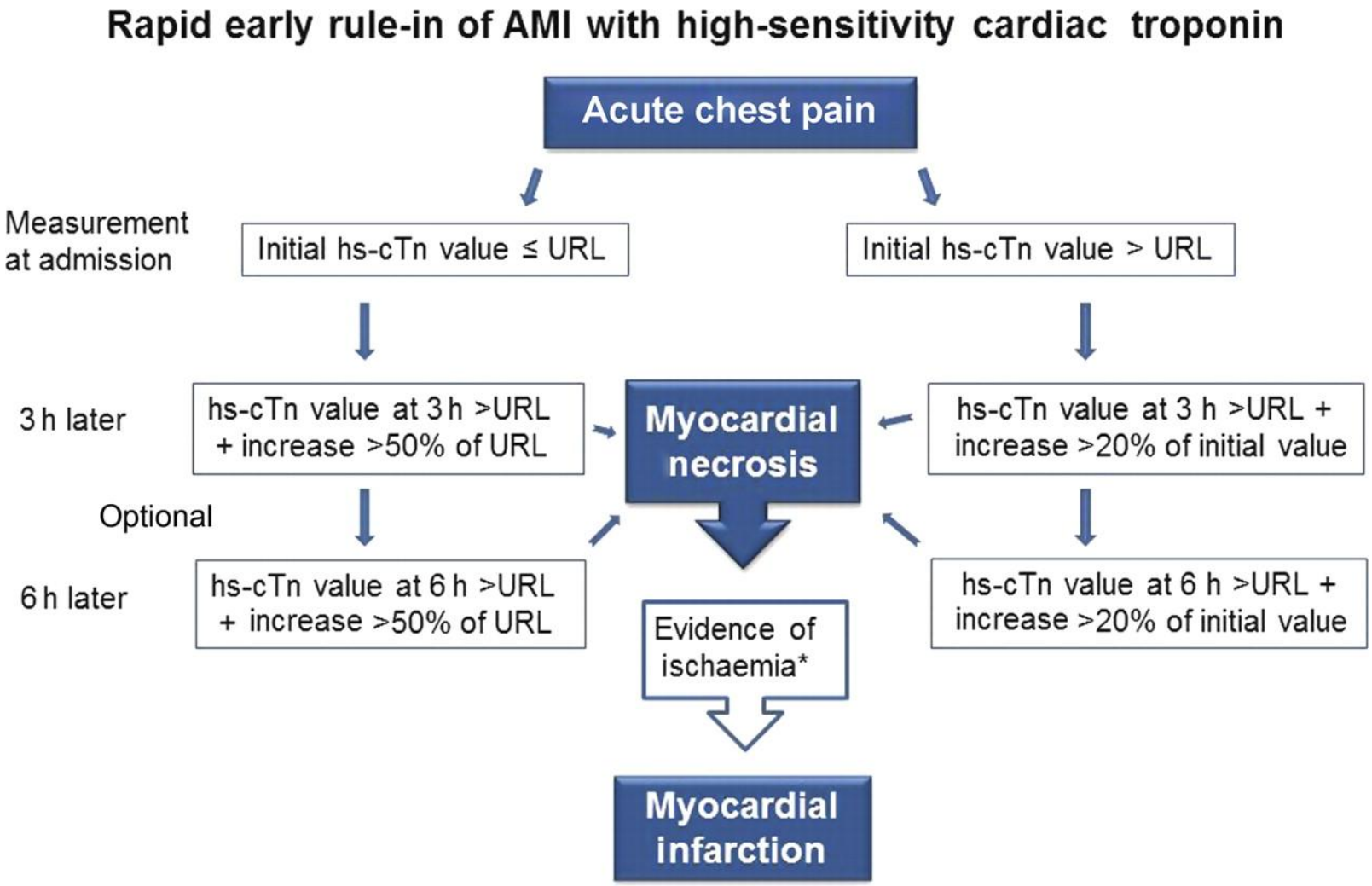
- 2% of the “normal” reference group will be “positive” with a result above the 99th percentile of the URL
- Projected that 10% or even 20% of patients who are evaluated in the ED with be positive (due to cardiac co morbidities)
- Inpatients may have an even higher positive rate

What to do with the hs-cTn?

- Serial testing is required. Even if the first is positive (unless “very positive”) it is not AMI.

- The Europeans have a protocol:

Template for rapid early rule-in of acute myocardial infarction with high-sensitivity cardiac troponin displaying an algorithm for clinical use of high-sensitivity cardiac troponin testing based on current knowledge.



Thygesen K et al. Eur Heart J 2012;eurheartj.ehs154

European Heart Journal

Things to keep in mind about hs-cTn

- It is a marker of myocardial necrosis and not a specific marker for AMI
- AMI requires a change in cTn levels, over time *AND* characteristic symptoms, EKG changes, and/or imaging indicative of AMI

- We should consider other causes of myocardial necrosis if the troponin is elevated, but does not meet this definition.

The Confusion

- We are used to the old generations of Troponins

- What does the ED do with the 1st "positive" troponin of 0.04?
- Does that patient get Anticoagulation?
- Will this positive test distract us from another disease process occurring in the patient?

Why have we moved to this Test?

- Very sensitive, and will hopefully identify all patients with ACS
- Often, it is a “Point of Care” test, with a rapid turn around time
- This will also hopefully identify patients early in the disease process

- And….

The Joint Commission!

- To be certified as a Chest Pain Center of Excellence you need to use this assay.

- This allows for “best practices” to be standardized across the Healthcare delivery system.

Causes of Elevated Plasma Cardiac Troponin Other Than Acute Coronary Syndromes

Cardiac Causes

- Cardiac contusion resulting from trauma
- Cardiac surgery
- Cardioversion
- Endomyocardial biopsy
- Acute and chronic heart failure
- Aortic dissection Cardiotoxic drugs
- Aortic valve disease
- Hypertrophic cardiomyopathy
- Tachyarrhythmia
- Bradyarrhythmia, heart block
- Apical ballooning syndrome
- Post–percutaneous coronary intervention
- Rhabdomyolysis with myocyte necrosis
- Myocarditis or endocarditis/pericarditis

Noncardiac Causes

- Pulmonary embolism
- Severe pulmonary hypertension
- Renal failure
- Stroke, subarachnoid hemorrhage
- Infiltrative diseases, eg, amyloidosis
- Critical illness
- Sepsis
- Extensive burns
- Extreme exertion

Clinical usefulness of Troponin

- Not all elevations of troponins are Acute MIs.
- A rising troponin over time is indicative of cardiac injury (AMI)
- A stable, but elevated troponin may be an indication of structural or other stable heart disease, and requires short term follow up
- Patients with a rising Troponin have a higher mortality rate than patients with a negative troponin, no matter what the underlying cause.

New Definitions

- Type II MI and Type II troponin leak are starting to be replaced with the term, “Demand Ischemia”

- Important for coding and quality measures
- What does it mean for the patient?

References

- *Preparing the US for High-Sensitivity Cardiac Troponin Assays*, JACC Vol. 61 No. 17, 2013.

- *How to interpret Elevated Cardiac Troponin Levels*, Circulation 2011;124:2350-2354.

- *How to use high-sensitivity cardiac troponins in acute cardiac care*, European Heart Journal. Doi:10.1093/euheartj/ehs154.