Re: Conversations in Cardiology – Is There Value in Post-PCI Troponin Measurements?

Clinical Editor's Corner, January 2023

To the Clinical Editor:

Mort,

The January 2023 "Conversations in Cardiology"[1] was timely and interesting. I recently discussed this very issue on CCU rounds.

A point that I do not believe was brought up by any of the contributors is the role of the "pre-discharge" troponin. To me, this is the most important post-PCI (especially post-STEMI/NSTEMI) troponin value. It is not unusual for a patient to re-present to the emergency department in the first week following hospital discharge. This is especially true for the population of patients we treat at a safety net hospital (underserved, underinsured, limited medical literacy). Peak troponin and 72-hour value also can have prognostic significance.

My strategy/protocol is as follows:

- Elective PCI/ACS: No post-procedure troponin measurement without a good reason. Such as when there is concern for Type 4a MI; major side-branch loss, prolonged <TIMI-3 flow, failed CTO-PCI with concern for collateral compromise, etc.

- NSTEMI: Case-by-case basis; Type I NSTEMI with rising troponin at time of catheterization usually warrants post-procedure troponin measurements.

- STEMI: Serial troponin to peak (which by definition requires at least 1 troponin after the peak) and then a pre-discharge troponin. If the patient is going to be in the hospital longer than 72 hours, I get a 72-hour troponin and do not worry too much about getting a pre-discharge.

My reasoning is based on the following:

1. As mentioned in the article, troponin peak correlates with infarct size, left ventricular remodeling and LV function. I practice at an integrated hospital system where demand for outpatient resources far exceeds availability. Despite performing >600 echocardiograms per month, there is still a >4-month wait for an outpatient echo. It usually takes 4-6 weeks for patient to get an outpatient cardiology clinic follow-up appointment after hospital discharge. Predicting which patients will have a higher likelihood of persistent LV dysfunction requiring closer follow-up and imaging allows for triage of these patients into the limited available earlier times for clinic follow-up and echocardiography. The PREDICTS trial found peak troponin along with EF at presentation to be the strongest predictors of EF recovery at 90 days.[2]

2. Analysis of the data from the EVOLVE trial found that 72-hour troponin I level not only correlated with infarct size, but also patients in the highest 72-hour troponin tertile suffered a significantly higher rate of clinical events (death, reinfarction, CHF, rehospitalization, ventricular arrhythmias, and new cardiogenic shock). Clinical events were nearly twice as common in patients in the highest tertile compared to those in the lowest or middle range tertile of troponin elevation (42% versus 23% versus 23%).[3]

3. Finally, knowledge of the pre-discharge troponin aids with clinical decision making when the patient re-presents to the ED early in the post-discharge timeframe. Frequently patients present with nonspecific or atypical complaints and almost always the ED provider orders a troponin. Troponin I (including high sensitivity) is known to follow a log linear decrease after reaching its peak (likely affected somewhat by renal function).[4] This allows for relatively accurate calculation of the expected troponin at the time of the unplanned ED visit. Together with the clinical scenario, I find this to be useful information when evaluating these patients.

I strongly agree with the tenant expressed by most colleagues that you should not order a test that will not provide useful information. It is true that in-hospital post-procedure troponin values rarely offer information that is immediately useful. However, for the reasons stated above I find value in trending troponin to the peak and obtaining a 72-hour or pre-discharge troponin measurement. This strategy might not be necessary for systems with more robust follow-up capabilities and who are caring for a different patient demographic.

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Response from the Clinical Editor:

Matt,

Great observation and indeed none [of the article contributors] mentioned this scenario. My feeling is that if the trops are high at discharge, the return visit 1 week later to the ED for some symptoms will also have a high trop and is no value by itself. If the trop is normal at discharge, then an elevated ED trop on the next visit would accelerate your care pathway back to the lab. For NSTEMI/STEMI patients who got stents, the trops don't matter. For the UA or others, the question of post-PCI trops at discharge would have a role in the return visit, but your need to return to the lab would be based on the presentation with some additional push from a newly elevated trop.

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References

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Abbreviations:
CCU, cardiac care unit; PCI, percutaneous coronary intervention; STEMI, ST-elevation myocardial infarction; NSTEMI, non STEMI; ACS, acute coronary syndromes; CTO, chronic total occlusion; LV, left ventricular; EF, ejection fraction; CHF, congestive heart failure; ED, emergency department; trop, troponin.

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