



Editorial

The results should be compared with a gold standard diagnostic test

Dear Dr J Douglas White,

The Editor of American Journal of Emergency Medicine

We appreciate the work presented in the recent study of Le et al [1] entitled “Clinical and financial impact of removing creatine kinase–MB (CK–MB) from the routine testing menu in the emergency setting”.

Their results lead to considerable cost-saving. According to the article conclusions, no acute coronary syndrome (ACS) has been missed after removing CK–MB from the routine testing menu in the emergency setting.

We confronted some points in this article that make us concerned about the conclusions:

- 1) In the study design, inclusion and exclusion criteria are not well defined. It is not clear whether the included patients have had ACS symptoms or referred to the emergency department (ED) due to other complaints.
- 2) In the same section, the other conditions that may elevate the troponin level such as congestive heart failure have not been considered [2].
- 3) In the Methods section, the results have not been compared to any gold standard diagnostic test (like angiography), so how the authors have accepted or rolled out the ACS is not obvious.
- 4) In the results part, there are 4 discrepant cases, while in Table 2, the final diagnosis of patient no. 2 is unstable angina (ACS); but the article states no ACS was missed.
- 5) According to the conclusion of the Chin et al article [3], peak CK–MB levels discriminate in-hospital mortality better than troponin in both ST-elevation myocardial infarction and non–ST-elevation myocardial infarction patients. Thus, serial measurements of CK–MB during hospitalization may better guide risk stratification and post-MI treatment intensity.

References:

- [1] Le, R.D., Kosowsky, J.M., Landman, A.B., et al., Clinical and financial impact of removing creatine kinase–MB from the routine testing menu in the emergency setting, *American Journal of Emergency Medicine* 2015; 33; 72–75.
- [2] Green, G.B., Hill, P.M., Chest pain: cardiac or not, in *Tintinalli's Emergency Medicine: A Comprehensive Study Guide*, Editor in Chief: Tintinalli, J.A., et al., McGraw-Hill, 2011.
- [3] Chin, C.T., Wang, T.W., Li, S., et al., Comparison of the prognostic value of peak CK–MB and troponin levels among patients with acute myocardial infarction, *Clinical Cardiology*. 2012; 35(7): 424–429.

THE AUTHOR RESPONDS:

We thank Dr Mojallal Najjar and his colleagues for their interest in our study [1] and the opportunity to elaborate on our study design. While trending of CK–MB levels may be valuable for risk stratification

of patients with known acute myocardial infarction during hospitalization [2], our study focused on the use of CK–MB in ED patients.

We included all patients that presented to the ED between January to June 2013 and January to June 2014 that had Troponin T or CK–MB performed in our laboratory. We excluded all patients except those with discrepant results, normal Troponin T, and elevated CK–MB or CK–MB index (see Figure 2). Since the sample was identified based on laboratory data, all conditions that could elevate Troponin T or CK–MB were considered equally, including patients that presented with congestive heart failure.

Two board-certified emergency physicians independently reviewed all available medical records within our enterprise electronic health record for all discrepant cases to determine the final diagnoses and to determine if clinically significant ACS events were missed. Our gold standard was expert consensus. We agree that an important limitation of our study is lack of a gold standard diagnostic test, such as angiography. The discrepant case in the post-intervention discrepant group with a final diagnosis of unstable angina was re-reviewed by both emergency physician reviewers and again deemed not a clinically significant miss of acute coronary syndrome. We regret not explicitly discussing clinical significance in the manuscript or including it in the tables and appreciate this opportunity to clarify. We appreciate your insight and comment.

- [1] Le, R.D., Kosowsky, J.M., Landman, A.B., et al., Clinical and financial impact of removing creatinine kinase–MB from the routine testing menu in the emergency setting, *American Journal of Emergency Medicine* 2015; 33; 72–75.
- [2] Chin, C.T., Wang, T.W., Li, S., et al., Comparison of the prognostic value of peak CK–MB and troponin levels among patients with acute myocardial infarction, *Clinical Cardiology*. 2012; 35(7): 424–429.

Milenko J. Tanasijevic, MD
Brigham and Women's Hospital
75 Francis St
Amory 2
Boston, MA 02115
USA
617-732-6360
mtanasijevic@partners.org

Reza Farahmand Rad, MD
Fatemeh Mojallal Najjar, MD*
Akram Zolfaghari Sadrabad, MD
*Emergency Medicine, School of Medicine
Shahid Sadoughi University of Medical Sciences, Yazd, Iran*
*Corresponding author. Emergency Medicine Department
Shahid Sadoughi Hospital, Safaieh, Yazd, Iran
E-mail addresses: rfarahmandrad@gmail.com
fmodjallal@yahoo.com
azolfaghari88@yahoo.com

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