CRP and Lactate individually are better predictors of mortality than Troponin I

Abnormal Troponin I adds additional prognostication for in hospital death

Elevated Troponin I is associated with a 2.5 day increase in length of stay, and increased likelihood of ICU admission

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Prognostic significance of troponin I elevation and other biomarkers in patients hospitalized with COVID-19

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BACKGROUND

Troponin I (TnI) elevation has been found to portend worse outcomes in patients with hospitalized with COVID-19 infection. We analyzed initial TnI level as a prognostic indicator compared to other biomarkers in a large cohort of patients from 4 hospitals comprising the Mainline Health System (MLHS).

METHODS

We identified 1424 adult patients, admitted to MLHS hospitals between 03/05/2020 and 05/31/2020 with COVID-19 infection. We compared outcomes of patients with initial abnormal TnI (≥0.05ng/ml, defined as >99th percentile upper reference limit) to patients with normal TnI levels using multivariable regression. Akaike information criterion (AIC) was used to compare Cox proportional hazard models of troponin I with other biomarkers. Smaller value indicates better model fit.

RESULTS

At baseline, patients with initial abnormal TnI were older in age (median(IQR) 80y (70-88) vs 68y (56-81) p <.0001), likely male (32% vs 25%, p =0.016), with higher prevalence of coronary artery disease (CAD) (4.4% vs 1.7%, p=0.0014). In models adjusting for age, gender, BMI, history of CAD, diabetes mellitus, hypertension, heart failure, stroke, abnormal TnI was associated with 2.5 days longer hospitalization(p=0.0015), higher odds of ICU admission (OR 2.5, 95% CI 1.8-3.3 p<0.001). Using AIC to compare multiple Cox proportional hazard models, TnI (3054) was a better predictor of death during hospitalization, than creatinine (3210) and hemoglobin (3209) but not C-reactive protein (CRP) (2819) or lactate (2859).

CONCLUSION

Abnormal TnI was associated worse outcomes in hospitalized COVID patients. However, CRP and lactate were better predictors of adverse outcomes than TnI, indicating systemic inflammation as the possible pathogenic basis of worse outcomes.

DISCUSSION

- Troponin elevation may indicate ventricular dysfunction in the setting of myocardial inflammation. Elevated NT pro-BNP levels have also been associated with worse in-hospital outcomes.(1)
- Although abnormal CRP and Lactate are alone better predictors of in-hospital mortality, the addition of troponin I should be considered for all admitted patients regardless of known history of coronary artery disease.