Relevance of myocardial injury biomarkers to the prognosis of COVID-19 patients

Relevancia de marcadores de daño miocárdico en la evolución de los pacientes con COVID-19

To the Editor,

Pneumonia caused by the coronavirus disease of 2019 (COVID-19) was initially identified in December 2019 in patients with pneumonia of unknown etiology. Since then, the illness has become a worldwide pandemic and has exerted considerable pressure on healthcare systems.[1] The first wave of infections around the world in 2020 and subsequent waves of infections have required reorganizing health centers and redistributing available resources. In this context, indicators would aid in adequately determining the prognosis of seriously ill COVID-19 patients and identifying those at lower risk.

The cohort study by Calvo-Fernández et al.[2] shows that 2 myocardial injury markers produced by different mechanisms, namely N-terminal propeptide brain natriuretic fraction (NT-proBNP) and high-sensitivity troponin-T (hs-TnT), are related to COVID-19 infection severity, expressed as the need for mechanical ventilation (MV) and as death events (DE). Recent research has shown an association between cardiac injury markers and COVID-19 infection severity.[3] High hs-TnT levels indicate myocardial ischemia, produced by both viral infections and inflammation, whereas NT-proBNP levels indicate ventricular dysfunction or overload (also related to pulmonary hypertension, hypoxic vasoconstriction, and acute dyspnea, among others). Therefore, both markers are complementary and can be used to build better models incorporating injury markers for other organs as well.[4,5] Nevertheless, several recent studies have been unable to show that including brain natriuretic peptide values improves prothrombin-based models.[6]

The results of Calvo-Fernández et al.[2] with 872 patients show that both markers are independent predictors of MV need and DE. NT-proBNP figures improve hs-TnT-based predictive models for MV and aggregate MV + DE.Table 1 of the additional material for the article by Calvo-Fernández et al.[2] shows a high negative predictive value for both markers versus DE and MV + DE at both 30 and 50 days, although this is not true when considering only the need of MV. Patients with NT-proBNP or hs-TnT below the threshold showed a higher proportion of MV than patients with high concentrations of both markers, which indicate greater severity and a higher rate of ICU admission.

We would like to congratulate the authors for their brilliant article, highly relevant at this time. However, there are certain limitations, some already mentioned by the study authors, that should be taken into account to properly interpret the results and potential extrapolation thereof to clinical practice. First, there is a possible selection bias because the study only considered hospitalized patients and does not reflect the general population. A measurement bias may also be present because many NT-proBNP (42%) or hs-TnT (25.3%) determinations were missing. Moreover, causality cannot be inferred because it is an observational, single-center study, hence the observations should be confirmed by other authors. Last, pharmacological treatments may be a confounding factor, as some drugs prescribed to more severe patients, such as hydroxychloroquine, have proven to be effective.

In view of the serious health situation caused by the COVID-19 pandemic, reliable indicators are needed to establish an adequate prognosis and to aid in decision-making. The study by Calvo-Fernández et al.[2] describes results consistent with other cohort studies[3] and reports an independent association between 2 myocardial injury markers (NT-proBNP and hs-TnT) produced by different mechanisms and the severity of COVID-19 infection. Future research may experimentally determine age- and sex-adjusted marker thresholds for the purpose of evidence-based patient screening.

AUTHORS' CONTRIBUTIONS

E. Alcaide had the original idea and contributed to writing the article. L. Álvarez Bota contributed with article correction and supervision. R. Salas contributed with article correction and supervision.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

Eric Alcaide,[a,]* Laia Álvarez Bota,[a] and Rosario Salas[b]

[a]Departament de Medicina, Universitat de Barcelona, Barcelona, Spain
[b]Servicio de Medicina Interna, Hospital Universitari Sagrat Cor-Grupo Quirónsalud, Barcelona, Spain

*Corresponding author:
E-mail address: ericalcaicaide1@gmail.com (E. Alcaide).

REFERENCES

1. Ibáñez B. Infartos en tiempos de la COVID-19. *Rev Esp Cardiol.* 2020;73:975–977.
2. Calvo-Fernández A, Izquierdo A, Subirana I, et al. Markers of myocardial injury in the prediction of short-term COVID-19 prognosis. *Rev Esp Cardiol.* 2021;74:576–583.
3. Qin JJ, Cheng X, Zhou F, et al. Redefining cardiac biomarkers in predicting mortality of inpatients with COVID-19. *Hypertension.* 2020;76:1104–1112.
4. Caro-Codón J, Rey JR, Buño A, et al. Characterization of NT-proBNP in a large cohort of COVID-19 patients. *Eur J Heart Fail.* 2021;23:456–464.
5. Khan S, Rasool S, Ahmed S. Role of cardiac biomarkers in COVID-19: what recent investigations tell us? *Curr Probl Cardiol.* 2021. http://doi.org/10.1016/j.cpcardiol.2021.100842.
6. d'Alessandro M, Bergantini L, Cameli P, et al. Peripheral biomarkers' panel for severe COVID-19 patients. *J Med Virol.* 2021;93:1230–1232.