Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Letter to the Editor

Using TAPSE (tricuspid annular plane systolic excursion) as a predictor of poor prognosis of COVID-19: is it enough?

Dear Editor,

We have read with great interest the study by Martha et al. (Martha et al., 2021) recently published in the *Journal*, where the authors studied the association between the tricuspid annular plane systolic excursion (TAPSE) and mortality in patients with COVID-19. In their systemic review, the authors confirmed that TAPSE was lower in non-survivors than survivors and that each 1 mm decrease in TAPSE led to an increase in mortality of approximately 20%. These findings are undoubtedly of great practical importance.

TAPSE reflects the longitudinal shortening of the right ventricle (RV) and is a simple and reproducible parameter of RV systolic function (Kaul et al., 1984). In severe COVID-19, the most important cause of RV dysfunction is pulmonary hypertension (PH) due to pulmonary endothelial injury (Varga et al., 2020), widespread small pulmonary arteriolar thrombi (Ciceri et al., 2020) and hypoxic pulmonary vasoconstriction (Pagnesi et al., 2020). On the other hand, severe systemic inflammation can cause myocardial injury (Santoso et al., 2020), and the RV is particularly susceptible to SARS-CoV-2 infection (Szekely et al., 2020).

Initially, with developing PH, RV responds to a significantly elevated afterload by increasing its contractility (homeometric response). This response may be accompanied by an increased TAPSE. However, with persistent and progressive PH, TAPSE may not correspond to an increase in pulmonary artery pressure (Tello et al., 2019). In this case, even with a small increase in afterload, a decrease in the contractility of the RV may be observed, which may be accompanied by a decrease in TAPSE. Thus, in COVID-19, it is important to evaluate TAPSE and the ratio of TAPSE to pulmonary artery systolic pressure (PASP) (TAPSE/PASP).

The indicator TAPSE/PASP is a valid surrogate for the assessment of RV-pulmonary arterial coupling (Tello et al., 2019). Previous studies have revealed a high predictive value of this parameter in patients with heart failure and PH (Guazzi, 2018). In a recent study, D'Alto et al. showed that the TAPSE/PASP ratio was an independent predictor of mortality of patients with COVID-19; moreover, the TAPSE/PASP ratio significantly added to the prognostic relevance of the PaO2/FiO2 ratio in these patients (D'Alto et al., 2020).

Given the multifaceted and complex pathways of pathogenesis in COVID-19, we believe that the determination of the TAPSE/PASP will improve the assessment of the prognosis of the disease. Further research is needed for systemic analysis.

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Author contributions

All authors contributed equally to the conception, drafting and final editing of this manuscript.

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