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

Letter to the Editor: Influence of right ventricular structure and function on hospital outcomes in COVID-19 patients

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To the Editor

We diligently read the article "Influence of right ventricular structure and function on hospital outcomes in COVID-19 patients" by Oweis et al. and we sincerely congratulate the authors for their bodacious efforts.[1]

As evidenced by multitudinous research on the association between right ventricular function and hospital outcomes in COVID-19 patients,[2] we acquiesce with the conclusion of the study that significant changes in right ventricular function and structure, specifically right ventricular dilatation, are associated with increased inpatient mortality as well as ICU mortality. However, we reckon it is essential to state additional noteworthy points that would enhance the quality of this article and add to existing knowledge of the crucial association being investigated.

First, a 2021 meta-analysis assessing the association between right ventricular dysfunction and mortality in COVID-19 patients denoted the importance of right ventricular ejection fraction by three-dimensional echocardiography as a comparatively more accurate and reproducible parameter to evaluate global right ventricular systolic function.[2] The authors of the current study measured left ventricular ejection fraction yet failed to assess the same parameter for the right ventricle, the inclusion of which would have strengthened the findings of the study.

Second, significantly lower right ventricular free wall longitudinal strain (RVFWLS) has been noted in survivors compared to nonsurvivors and each 1% increase of RVFWLS is linked with higher mortality.[2] Furthermore, tricuspid S' peak systolic velocity was significantly lower in survivors compared to nonsurvivors and every 1 cm/s decrease in tricuspid S' peak systolic velocity was associated with higher mortality.[2] The authors should have included these echocardiographic markers to enhance the validity of the results.

Third, a 2021 cross-sectional study in Bolivia used the critical care ultrasonography ORACLE protocol to identify the most frequent alterations in right ventricular function and their influence on adverse outcomes.[3] The algorithm allows the evaluation of left ventricular and right ventricular function, valves, pericardial effusion, diastolic function and filling pressures, pulmonary hemodynamics, and regional wall motion.[3,4] The authors should have considered using the algorithm to obtain greater prognostic certainty and thus determine the most appropriate treatment.

Fourth, postulated mechanisms for the myocardial injury resulting in right ventricular dysfunction include the expression of angiotensin-converting enzyme 2 (ACE2) in the cardiovascular system which mediates the entry of the COVID-19 virus into cardiomyocytes to cause direct damage.[5] Elevation of troponin-I levels is accompanied by an exponential increase in other inflammatory markers, such as lactate dehydrogenase, ferritin, tumor necrosis factor-α, interleukin-6, and interleukin-8.[5] This could be the underlying cause of a cytokine storm syndrome which may result in cardiac involvement. An assessment of these markers should have been carried out by the authors to explore the underpinning pathophysiology of right ventricular involvement.

Fifth, the authors should have considered a larger population sample to increase the legitimacy of their findings.[3] Sixth, data on lifestyle and nutrition such as sodium intake, smoking, alcohol consumption, and substance abuse were not reported which could result in compounding due to increased comorbidities. Finally, multifaceted approaches should be adopted to enhance investigations and treatments.

Disclaimer

None to declare.

Conflict of interest

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Declaration of interests

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CRediT authorship contribution statement

Dr. Mustafa Javaid: Conceptualization, Data curation, Methodology, Software, Writing – original draft. **Dr. Faizan Masood:** Data curation, Software, Writing – original draft. **Dr. Arsalan Nadeem:** Supervision, Software, Writing – review & editing.

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