

The value of E/e' ratio in critically ill patients should not be underestimated

Dear Editor,


We read with interest the elegant review published by Sunderji et al¹ on pitfalls related to the interpretation of the E/e' ratio for the diagnosis and grading of left ventricular diastolic dysfunction (LVDD). The E/e' ratio variable has been validated as surrogate marker of increased mean pulmonary capillary wedge pressure in certain clinical conditions. The authors nicely summarized several technical and pathophysiological factors affecting the measurement of the E/e' ratio or confounding its interpretation. Undoubtedly, the diagnosis and grading of LVDD is a clinical challenge, and even applying the most recent guidelines² a not negligible proportion of patients remains unclassified, both in the cardiology setting³ and in critical care.⁴ The authors of the review¹ stated that the use of E/e' ratio "cannot be extrapolated to other situations—such as critically ill patients or children."

The use of critical care echocardiography is rapidly growing,⁵ and much interest is directed toward the study of LVDD. We would like to point out the clinical value of measuring E/e' ratio in critically ill patients, especially in those with sepsis where a greater number of studies have been conducted. Although the diagnosis of septic cardiomyopathy remains challenging,⁶ both e' and E/e' have been strongly associated with mortality in this population of patients,⁷ further confirming the role of LVDD in the outcome of critically ill patients.⁸

While we agree that E/e' ratio suffers from several limitations (nicely explained by the authors),¹ we think that tissue Doppler imaging parameters remain very useful in critically ill patients, particularly because the other two parameters currently recommended for the diagnosis of LVDD²—left atrial (LA) volume and tricuspid regurgitant jet velocity—have lower reliability in the critical care setting.⁹ As example, LA enlargement is observed when the LVDD is chronic, but it cannot be consistently used under acute conditions. Indeed, the LA is unlikely to suddenly dilate due to acute worsening of LVDD. For instance, in patients suffering from acute myocardial infarction, at 4-month follow-up, LA remodeling was found in over one third of patients, but after one month the change in LA volume was not different between patients with or without subsequent remodeling.¹⁰ Furthermore, the LA volume is influenced by loading conditions, and critical care patients are exposed to rapid changes of their circulating volume. Also the tricuspid regurgitant jet velocity is grossly influenced in critically ill patients, and the effects of mechanical ventilation cannot be overemphasized. Indeed, pulmonary vascular resistances increase when patients are ventilated with

positive airway pressures and consequently the strain applied on the right ventricle becomes greater, even in patients with no previous myocardial disease.¹¹

In summary, while the E/e' ratio is certainly influenced by several conditions, we think that remains valuable in critically ill patients. In this population of patients, the E/e' ratio probably suffers less than other recommended parameters from confounding effects. More studies are certainly warranted.

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