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Right ventricle in severe sepsis and septic shock

To the Editor,

We read with interest an article by Dr. Cirulis and colleagues recently published in this Journal [1]. They included 146 consecutive ICU patients admitted with septic shock or severe sepsis who have an echocardiogram within 48 h of admission. The authors admitted the ratio of right ventricular end-diastolic diameter (EDD) to left ventricular EDD (RV/LV) is a measure predictive of right ventricular failure. They found that an increased RV/LV does not predict mortality in severe sepsis or septic shock. However, there are considerable discrepancies between results of this study and other studies carried out in different countries. For example, Vallabhajosyula and colleagues evaluated 388 patienst with sepsis and septic shock and detected right ventricular dysfunction in 214 (55.2%) of the patients [2]. They used American Society of Echocardiography criteria for echocardiographic assessment. New onset RV dysfunction was assessed using multimodality parameters including semiquantitative size and function, tricuspid annular plane systolic excursion (TAPSE) < 16 mm by M-mode ricuspid lateral annulus tissue Doppler systolic velocity < 0.15 cm/s and right ventricle fractional area change <35%. The results of this study revealed that isolated right ventricular dysfunction was an independent predictor of worse 1-year survival. Therefore, we think that potential infuence of echocardiographic results on clinical care and outcomes could not be assessed with Cirulis and colleagues' study due to underuse of different echocardiographic parameters such as TAPSE, and right ventricle fractional area for the assessment of right ventricular function in patients with sepsis and sepic shock.

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RV/LV ratio in severe sepsis and septic shock: Response to Letter to the Editor

To the Editor,

Thank you for the opportunity to respond to the issues raised by Dr. Çil and colleagues regarding our recent publication in the *Journal of Critical Care* [1]. Dr. Çil and colleagues cite a recent publication by Vallabhajosyula et al. as a comparison [2]. There are substantial differences in exclusion criteria and baseline patient characteristics between our papers that might have led to major differences in findings. Nevertheless, there are many similarities between the investigations. Most striking was the common finding that no echocardiographic parameter assessing right ventricular (RV) function was able to identify patients at increased risk of early mortality. In our study, this was defined as 30-day mortality; Vallabhajosyula et al. used in-hospital mortality without further definition.

We specifically set out to assess the utility of RV/LV EDD ratio as a measure of RV dysfunction and predictor of mortality in sepsis and septic shock. An elevated RV/LV ratio predicts poor short- and long-term outcomes in patients with pulmonary hypertension and acute pulmonary embolism [3,4]; we investigated whether this parameter would perform similarly in a more heterogenous population of sepsis patients with a focus on 30-day mortality. The potential benefit of finding a predictor of early mortality is a point on which we agree with Vallabhajosyula, but equally were unable to ascertain.

In our efforts to identify a specific predictor of early mortality using echocardiography, Vallabhajosyula et al. and we encountered difficulties in evaluating right ventricular dysfunction. In contrast to left ventricular dysfunction, there is a general lack of agreement on how to best quantify RV dysfunction using available echocardiographic measures (TAPSE, RV ejection fraction, RV size, RV diastolic dysfunction). Furthermore, prior studies of individual parameters (such as RV ejection fraction) in sepsis and septic shock have shown mixed results [5-9]. Our finding that RV/LV ratio has no predictive ability for 30-day mortality adds to the conclusion that more investigation is required to determine whether there exists a sensitive and specific combination of echocardiographic abnormalities associated with adverse outcomes. From some positive finding of an association, a more precise and standardized definition of clinically important RV failure might be derived.

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