

## Editorial



# Enhancing Prognostication in Acute Heart Failure: Significance of RV-PA Coupling and the TAPSE/PASP Ratio

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In patients with heart failure (HF), understanding the relevance of right ventricular (RV) function and its interaction with the pulmonary artery (PA) is crucial due to their significant impact on patient outcomes.<sup>1-3)</sup> The RV, intricately connected to pulmonary circulation, experiences dynamic hemodynamic changes during HF that affect its contractility, compliance, and overall performance. Recognizing the intricate interplay between RV function and the hemodynamic burden imposed by the PA is emerging as a pivotal aspect for predicting clinical outcomes and tailoring HF management strategies.<sup>4)5)</sup>

Numerous studies have underscored the pivotal role of RV-PA coupling in patients with HF, establishing a robust correlation between it and mortality risk, hospitalization rates, and exercise capacity.<sup>6-8)</sup> Within this context, the tricuspid annular plane systolic excursion to pulmonary artery systolic pressure ratio (TAPSE/PASP) emerges as an invaluable non-invasive marker that offers a comprehensive understanding of RV function and its intricate interplay with PA dynamics across diverse hemodynamic loading conditions, while also bearing crucial prognostic implications.<sup>9)15)</sup>

In this issue of the *Journal of Cardiovascular Imaging*, Bok et al.<sup>16)</sup> provide further insight into the significance of RV-PA coupling in patients with acute HF (AHF). The study cohort, consisting of 1,147 patients hospitalized with AHF, demonstrated a significant association between the TAPSE/PASP ratio and echocardiographic parameters such as left ventricular ejection fraction, left atrial diameter, left atrial global longitudinal strain, mitral E/E' ratio, as well as right ventricular fractional area change, offering a comprehensive understanding of complex cardiac dynamics. Over a median follow-up of 29.0 months, the study recorded a mortality rate of 33.7%, emphasizing the critical need for prognostic markers in AHF. The analysis revealed that PASP, TAPSE, and the TAPSE/PASP ratio individually emerged as significant predictors of mortality in univariate assessments. After multivariate analysis, the TAPSE/PASP ratio retained its statistical significance as an independent predictor for all-cause mortality, highlighting its potential as a valuable prognostic marker, even when considering other factors. Receiver operating curve analysis identified a TAPSE/PASP ratio threshold of 0.33, yielding a sensitivity of 65% and specificity of 47% in predicting mortality. Importantly, a TAPSE/PASP ratio below this threshold correlated with an elevated risk of mortality, a

finding of substantial clinical importance. These findings build upon previous research and align with recent studies that underscore the prognostic value of the TAPSE/PASP ratio in HF and pulmonary hypertension.<sup>13,15</sup> This study enhances our ability to identify high-risk patients, potentially enabling more precise management strategies and tailored interventions to improve patient outcomes.

In light of Bok et al.'s study,<sup>16</sup> which adds a new dimension to the existing body of cardiovascular research, it builds upon prior research momentum, elevating the TAPSE/PASP ratio from a mere parameter to a potentially essential diagnostic and prognostic tool. By highlighting the significance of TAPSE/PASP within the context of AHF, this study contributes vital insights that resonate within the realm of clinical practice, urging us to heed the symphony orchestrated by the TAPSE/PASP ratio in cardiovascular assessment.

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#### Conflict of Interest

The author has no financial conflicts of interest.

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