

Title: TAPSE/sPAP versus RV/LV for predicting adverse in-hospital outcomes in normotensive acute pulmonary embolism

Background: Echocardiographic assessment of right ventricular dysfunction supports risk stratification in normotensive acute pulmonary embolism (APE). The tricuspid annular plane systolic excursion to systolic pulmonary artery pressure ratio (TAPSE/sPAP) reflects right ventricular–pulmonary arterial coupling, but its discrimination compared with the right-to-left ventricular diameter ratio (RV/LV) remains uncertain.

Purpose: To compare TAPSE/sPAP and RV/LV for predicting adverse in-hospital outcomes in initially normotensive patients with APE.

Methods: This single-center analysis of a prospective registry included 401 consecutive normotensive patients with APE who underwent echocardiography within 24 hours of admission. The composite endpoint comprised in-hospital all-cause mortality, cardiopulmonary resuscitation, tracheal intubation, hypotension with hypoperfusion requiring vasopressors, or reperfusion treatment. Paired receiver operating characteristic (ROC) analyses were restricted to 354 patients with complete data, including 23 endpoint events. Areas under the ROC curves (AUCs) were compared using DeLong's test. Optimal thresholds were selected using Youden's index.

Results: Median age was 64 years, and 53.1% of patients were women. The endpoint occurred in 25 patients (6.2%) overall, including seven in-hospital deaths. Patients experiencing the endpoint had lower TAPSE/sPAP and higher RV/LV. In the paired analysis, AUC was 0.74 (95% CI 0.67–0.82) for TAPSE/sPAP and 0.71 (95% CI 0.60–0.83) for RV/LV, without a significant difference ($p=0.869$). At the optimal TAPSE/sPAP threshold of 0.35 mm/mmHg, sensitivity was 68%, specificity 76%, positive predictive value 16%, and negative predictive value 97%. The corresponding values for the RV/LV threshold of 1.10 were 70%, 73%, 15%, and 97%, respectively.

Conclusions: TAPSE/sPAP and RV/LV demonstrated moderate discrimination for adverse in-hospital outcomes in normotensive APE, with no evidence of superior discrimination for TAPSE/sPAP. Both thresholds yielded high negative predictive values but low positive predictive values. These findings support further evaluation of both indices within integrated clinical risk assessment. External validation is required, particularly because the composite endpoint included treatment decisions and few events occurred.

Figure. Receiver operating characteristic curves for TAPSE/sPAP and RV/LV in predicting the clinical endpoint. Points indicate the optimal cutoff determined using Youden's index.

