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Title: Accurate monitoring of the right ventricular ejection fraction by echocardiography in pulmonary hypertension

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Body: Background Right ventricular ejection fraction (RVEF) is an emerging prognostic predictor of patients with pulmonary hypertension (PH). Aim We sought to evaluate the accuracy and suitability of two echocardiographic parameters of right ventricular systolic function: tricuspid annular plane systolic excursion (TAPSE) and systolic lateral tricuspid annular motion velocity (TVlat) in the monitoring of RVEF of PH patients. Methods Consecutive 37 patients with PH (median pulmonary arterial pressure 36 (28 -43) mmHg) were studied. We measured TAPSE and TVlat as echocardiographic indices of RVEF. TAPSE and TVlat measured at baseline and at follow-up, and the changes during follow-up were compared with those of magnetic resonance imaging (MRI)-derived RVEF. Receiver operating characteristic (ROC) analysis was conducted to calculate the cut-off levels of TAPSE and TVlat for the identification of patients with improved RVEF. Results TAPSE and TVlat were significantly correlated with MRI-derived RVEF at baseline (TAPSE: $r=0.90$, TVlat: $r=0.69$) and at follow-up (TAPSE: $r=0.87$, TVlat: $r=0.64$). The changes during follow-up were also significantly correlated with that of MRI-derived RVEF for TAPSE ($r=0.80$) and for TVlat ($r=0.71$). Twenty-seven of 29 patients (78%) exhibited improved RVEF at follow-up by MRI, and the ROC analysis showed that Δ TAPSE > -0.9 mm and Δ TVlat > 0.1 cm/sec identified PH patients with improved RVEF with high sensitivity (TAPSE 90%, TVlat 90%) and specificity (TAPSE 88%, TVlat 100%), and with high AUC (TAPSE 0.95, TVlat 0.97). Conclusion TAPSE and TVlat are accurate indices of RVEF that allows for identifying PH patients with improved RVEF by PH-targeted therapy.