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Is Right Ventricle–to–Left Ventricle Diameter Ratio, A Static Parameter Measured by Computed Tomography Pulmonary Angiography, An Effective Index of Right Ventricular Function?

LETTER TO THE EDITOR

To the Editors,

I have read with great interest the recent article by Erol et al,[1] in which the authors investigated agreement between transthoracic echocardiography (TTE) and computed tomography pulmonary angiography (CTPA) for detection of right ventricular dysfunction in pulmonary embolism. In this article, the researchers have reported that "both TTE and CTPA, with TTE being more specific, are reliable imaging methods to detect right ventricular dysfunction (RVD). Additionally, the combination of CTPA parameters rather than individual RV/LV ratio increases the sensitivity of CTPA." The reseachers defined TTE findings of RVD as the enlarged right ventricle (RV), flattened interventricular septum (IVS), RV hypo/akinesia, pulmonary arterial systolic pressure ≥40 mm Hg, or right heart thrombus. RV/left ventricle (LV) diameter ratio ≥1 or IVS flattening/bulging or IVC contrast material reflux were considered criteria for RVD according to CTPA.

As can be understood, the RV/LV diameter ratio measured by CTPA is a static measurement and cannot directly reflect right ventricular performance. An enlarged RV may have normal contractions/ejection fraction. Conversely, a small-sized RV may not have normal function. In other words, the RV/LV ratio measured by CTPA does not provide precise quantitative information about more understandable and functional parameters of the RV, such as tricuspid annular plane systolic excursion (TAPSE) and RV fractional area change (FAC). Therefore, its use in clinical practice is limited.

In many PEs, the fact that the RV is not enlarged but there is dysfunction at the tissue level can be considered another limitation of RV/LV diameter ratio. In addition, during a comprehensive literature review,[2-5] it was noticed that the RV/LV diameter ratio specificity and prediction of mortality were low, as in the above-mentioned article.[1] In addition, RVD measured by TTE and CTPA was compared simply, and the RV/LV diameter ratio measured by CTPA and the functional parameters of the RV were not examined separately on an individual basis.

Therefore, studies are needed to determine numerical cut-offs between the RV/LV diameter ratio and other quantitative parameters of RV function, including TAPSE and FAC. For example, it may be useful to present results such as "1.05 RV/LV diameter ratio is approximately equal to 13 mm/s TAPSE" so that the RV/LV diameter ratio can be understood more easily and can be used in daily practice.

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