Doppler Echocardiographic Index of Global Right Ventricular Function

To the Editor:

In pulmonary disease, right ventricular dysfunction has an important bearing on prognosis. Incalzi et al recently demonstrated the prognostic implications of echocardiographic signs of chronic cor pulmonale in patients with chronic obstructive pulmonary disease. Two electrocardiographic features in particular, an S1S2S3 pattern and a P-wave axis of $>90^\circ$, suggesting right atrial overload, predicted mortality over 13 years of follow-up. This well-conducted study illustrates the importance of an inexpensive diagnostic technique in risk stratification and is of particular value since the clinical signs of cor pulmonale are too insensitive for routine clinical application. It has been preceded by a wealth of work highlighting the considerable effort that has gone into the identification of a prognostic marker that is widely applicable, noninvasive, and easily interpretable and repeatable.

Of note, the authors indicate the failings of echocardiographic evaluation of the right heart in this setting. They refer to the technical difficulties of transthoracic studies in patients with lung hyperinflation and to the high error when pulmonary artery pressure is estimated based on a tricuspid regurgitant jet, which is present in only a minority of patients. Tei et al recently described a Doppler echocardiographic index of global right ventricular function based on tricuspid and pulmonary flow dynamics. Assessment of right ventricular function has been confounded by the asymmetrical geometry of the chamber, but since this index is derived from pulsed-wave Doppler measurements, evaluation can be made independently of 2-D imaging, a further advantage given poor patient echogenicity. The index is reproducible and not affected by heart rate or the severity of tricuspid regurgitation. Among a variety of clinical and echocardiographic variables, the index was the most powerful predictor of prognosis in a study of patients with primary pulmonary hypertension. We have calculated the index in patients with chronic cor pulmonale: a negative prognostic finding in chronic obstructive pulmonary disease. Circulation. 1999;99:1600–1605.


Response

We have read with great interest the letter by Dr Burgess and colleagues. The proposed method of assessing right ventricular function looks quite promising, especially because of its alleged applicability in various clinical and hemodynamic conditions. The authors demonstrated that this index is easily measurable both in chronic obstructive pulmonary disease (COPD) and in interstitial lung disease and qualifies as a reliable indirect measure of pulmonary hypertension. However, the available evidence supports its role as a prognostic tool only in primary pulmonary hypertension, which is a relatively uncommon condition. Thus, we think that efforts should be made to verify whether this index carries autonomous prognostic implications in COPD as well as in pulmonary hypertension complicating congestive heart failure. Eventually, the response of this index to acute changes in pulmonary artery pressure should be assessed to clarify its predictive power.

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