

## Letter to the Editor

## Right Ventricular Strain in Patients with Moderate Heart Failure

YAVUZER KOZA, OGUZHAN BIRDAL

*Ataturk University Faculty of Medicine, Department of Cardiology, Erzurum, Turkey*

Key words: **Right ventricular function, longitudinal strain.**

*Manuscript received:*  
May 15, 2014;  
*Accepted:*  
November 4, 2014.

*Address:*  
Yavuzer Koza

*Ataturk University  
Faculty of Medicine  
Department of  
Cardiology  
Yakutiye, Erzurum,  
Turkey 25100  
[yavuzerkoza@hotmail.com](mailto:yavuzerkoza@hotmail.com)*

We have read with interest the article entitled “Long-term prognostic value of longitudinal strain of right ventricle in patients with moderate heart failure” by Vizzardi et al<sup>1</sup> in a recent issue of the Hellenic Journal of Cardiology. These authors investigated the prognostic value of several echocardiographic parameters for evaluating right ventricular (RV) function in patients with chronic heart failure (HF) who were on optimal medical treatment. Among the investigated parameters – tricuspid annular plane systolic excursion (TAPSE), right ventricular fractional area change (RV-FAC), right myocardial performance index (MPI), tissue Doppler peak myocardial velocity (Sm), Doppler tissue imaging (DTI) longitudinal RV strain – only DTI RV strain, which was measured in the basal and the middle region, was associated with outcomes in patients with moderate HF.

The RV is usually thin-walled, making the assessment of strain and strain rate more difficult.<sup>2</sup> Another important consideration is the interventricular septum. Although the interventricular septum forms part of the RV, whether it should be included as part of the assessment of global RV function is debatable, as the interventricular septum is affected more by the left ventricle than the RV except in advanced RV dysfunction or severe pulmonary hypertension.<sup>3</sup> Because the study of Vizzar-

di et al included mainly moderate HF patients with no advanced RV dysfunction or pulmonary hypertension, it would have been very useful to assess the interventricular septum.

The authors mentioned that RV strain appears to be a more reliable and specific method for evaluating RV performance, because of its lesser dependency on pulmonary artery pressure and loading conditions. However, loading conditions should be considered when deformation measurements are interpreted. In the context of marked changes in afterload, reduced RV deformation is not synonymous with myocardial injury.<sup>4</sup>

Although an assessment modality has not been fully established, in patients with HF the role of RV diastolic function should also be considered when drawing conclusions from the current and other RV strain studies.<sup>5</sup> In patients with left sided HF, ventricular interdependence is another important caveat, as the evaluation of its effect is quite difficult. Therefore, the ideal parameter for evaluating RV function should be a load-independent one that includes assessment of both RV systolic and diastolic function. It is clear that a new parameter, rather than RV MPI or TEI index (also load dependent, inadequate in high or irregular heart rate rhythms), is needed to assess RV systolic and diastolic functions.<sup>6</sup>

In conclusion, assessment of RV func-

tion by strain in patients with HF should be further evaluated by large scale-prospective studies.

## References

1. Vizzardi E, D'Aloia A, Caretta G, et al. Long-term prognostic value of longitudinal strain of right ventricle in patients with moderate heart failure. *Hellenic J Cardiol.* 2014; 55: 150-155.
2. Marwick TH. Measurement of strain and strain rate by echocardiography: ready for prime time? *J Am Coll Cardiol.* 2006; 47: 1313-1327.
3. Leung DY, Ng AC. Emerging clinical role of strain imaging in echocardiography. *Heart Lung Circ.* 2010; 19: 161-174.
4. La Gerche A, Jurcut R, Voigt JU. Right ventricular function by strain echocardiography. *Curr Opin Cardiol.* 2010; 25: 430-436.
5. Haddad F, Hunt SA, Rosenthal DN, Murphy DJ. Right ventricular function in cardiovascular disease, part I: Anatomy, physiology, aging, and functional assessment of the right ventricle. *Circulation.* 2008; 117: 1436-1448.
6. Pasipoularides A. Fluid dynamics of ventricular filling in heart failure: overlooked problems of RV/LV chamber dilatation. *Hellenic J Cardiol.* 2015; 56: 85-95.