

Right Ventricular Diastolic Function in Patients with Thalassemia Major

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Dear Editor,

We read with great interest the article "Echocardiography in Thalassemic Patients on Blood Transfusions and Chelation without Heart Failure" written by Rodrigues et al¹. They aimed to evaluate cardiac structure and function by conventional Doppler echocardiography and tissue Doppler imaging in patients with thalassemia major (TM) and no clinical evidence of heart failure. They found that left atrium volume index, mitral septal E/Em ratio and duration of reverse pulmonary vein flow were significantly higher in TM than in anemia and healthy groups. However, no differences were found in left and right ventricular structures and systolic function indexes between the groups. We believe that these findings will act as a guide for further studies regarding echocardiographic evaluation of left and right ventricular functions in patients with TM.

Contrary to common belief, the right ventricle is not a passive chamber. A large number of acute and chronic diseases have been associated with RV diastolic dysfunction, including both pressure and volume overload pathologies such as primary lung disease, congenital heart disease, cardiomyopathies, ischemic heart disease, systemic diseases^{2,3}. Only a few studies assessed the RV diastolic function. In those studies, the RV diastolic function has been evaluated using Doppler velocities of the transtricuspid flow (E, A, and E/A), tissue Doppler velocities of the tricuspid annulus (E', A', E'/A'), deceleration time, and IVRT. Most commonly used in recent studies are the tricuspid E/E' ratio, RA area or volume, and diastolic strain rate. A good correlation was shown between the tricuspid E/E' ratio and RA volume, and hemodynamic parameters. An E/E' ratio ≥ 4 had high sensitivity and specificity for predicting RA pressure ≥ 10 mm Hg in non-cardiac surgery intensive care unit patients⁴. The current study¹ did not evaluate RV diastolic function and RA volume. Further studies should be conducted to assess RA volume and RV tissue Doppler diastolic parameters such as tricuspid E/E' ratio.

Keywords

Ventricular Function, Right; beta-Thalassemia; Echocardiography.

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Reply

In response to the letter, we appreciate the interest shown and comments made on our work.¹ We hope that our data will stimulate new research especially in the field of biventricular diastolic function in individuals with thalassemia major.

We fully agree with comments in the letter on cardiac right chambers evaluation. According to Efthimiadis et al², patients with thalassemia major and right ventricular (RV) restrictive filling pattern had a 15-year cumulative survival rate of 34%, whereas in those without restrictive pattern, survival rate was 82%. Iron deposition is the main cause of cardiac injuries and can affect all structures, including papillary muscles, conduction system, pericardium, and all cardiac cavities. However, as the left ventricular free wall epicardium is the most affected site³, the left ventricle is the cavity generally evaluated.

We would like to take this opportunity to state that we have analyzed some echocardiographic parameters related to RV systolic and diastolic functions in our patients (unpublished data), but we have failed to demonstrate any significant difference between groups (Thalassemia, Healthy, and Anemia). These parameters include ejection fraction,

Tei index, tricuspid annulus plane systolic excursion, and tissue Doppler velocities of the tricuspid annulus (S', E', A', and E'/A'). We believe that new techniques for evaluating ventricular and atrial functions, such as speckle tracking, strain, and strain rate⁴⁻⁶ will be useful in future studies of patients with thalassemia major to identify early signs of right heart structural and functional changes.

Sincerely,

Alexandre Rodrigues,
Fabio Villaça Guimarães-Filho,
João Carlos Ferreira Braga,
Cássia Spínola Custódio Rodrigues,
Paulo Waib,
Antonio Fabron-Junior,
Doralice Marville Tan,
Ana Cristina C V França,
Marina Politi Okoshi,
Katashi Okoshi.

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