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Left Ventricular Deformation in β -thalassemias

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Aims

To assess the value of speckle tracking echocardiography in detecting early left ventricular deformation abnormalities in both β -thalassemia intermedia and major who were compliant to treatment since infancy, with serum ferritin <1500 ng/ml, myocardial T2* higher than 20 ms and normal left-ventricular dimensions and ejection fraction; and to illustrate the deformation pattern in each of the two β -thalassemia phenotypes and its possible difference from normal.

Methods

The study population comprised 3 groups: group-1 (26 β -thalassemia major patients), group-2 (24 thalassemia intermedia patients), and group-3 (21 age-matched normal individuals). All subjects had arterial pressure measured, serum ferritin, conventional echocardiography, and speckle tracking echocardiography. Only patients with thalassemia major had myocardial T2* measurement.

Results

Diastolic blood pressure was lower in both thalassemia groups than in normal ($P < 0.001$). All enrolled individuals, including both thalassemia groups, had normal ejection fraction. All groups showed no difference in left-ventricular dimensions, indexed volumes, or global longitudinal strain. The global radial and circumferential strain were lower in β -thalassemia groups than in the control group ($P < 0.001$), with no significant difference between both thalassemia groups. Peak twist and peak systolic apical rotation were lower in β -thalassemia groups ($P < 0.001$ for both parameters), with no significant difference between the two thalassemia groups. Serum ferritin was negatively correlated with diastolic pressure, global radial strain, global circumferential strain, peak apical rotation and peak twist.

Conclusion

Young patients with both β -thalassemia intermedia and well-treated β -thalassemia major have lower left-ventricular global radial, circumferential and basal longitudinal (but not global longitudinal) strain values than normal, as well as different rotational pattern characterized by decreased apical systolic rotation and peak twist.