

Study of Left Ventricular Function in Diabetic Patients with Normal Ejection Fraction: Evaluation by Tissue Doppler and Speckle Tracking Echocardiography

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Abstract

Background: The effect of Diabetes Mellitus (DM) on the left ventricular (LV) diastolic function is still controversial. The aim of this study was to demonstrate the effect of type 2 DM on the LV diastolic function according to the latest recommendations of the American Society of Echocardiography, and on LV systolic function assessed by speckle tracking echocardiography among asymptomatic normotensive patients with preserved LV ejection fraction (EF).

Methods: LV diastolic function was assessed by pulsed Doppler and tissue Doppler echocardiography. LV systolic function was assessed by speckle tracking echocardiography in 40 patients with type 2 DM and LVEF >50%. The results were compared with 20 healthy control subjects.

Results: Average LV global longitudinal strain (GLS) was lower in diabetic persons in comparison to control subjects (16.9 ± 1.6 versus 19.4 ± 1.9 , $p < 0.001$). Doppler echocardiography showed that diabetic group in comparison with controls had a higher peak A (61.25 ± 13.7 versus 47.9 ± 7.7 , $p < 0.001$) and a lower E/A ratio (1.12 ± 0.40 versus 1.49 ± 2.9 , $p = 0.001$). Tissue doppler imaging showed lower e' septal (8.1 ± 2 versus 11.2 ± 2.1 , $p < 0.001$), lower e' lateral (10.1 ± 2.3 versus 13.4 ± 2.2 , $p < 0.001$), a higher E/ e' (7.4 ± 1.6 versus 5.9 ± 0.9 , $p < 0.001$), and a higher LAVI (28.2 ± 4.5 versus 25.5 ± 3.7 , $p = 0.01$) than controls. The mean values of e' septal, e' lateral and LAVI didn't reach the recommended values to diagnose LV diastolic dysfunction.

Conclusions: In asymptomatic normotensive patients with type 2 DM and preserved LVEF, the LV GLS was reduced, while there was no significant evidence of diastolic dysfunction.

Keywords: Diabetes Mellitus; Diastolic dysfunction; Speckle tracking echocardiography; Global longitudinal strain