above-mentioned points should be evaluated and included in the statistical analysis. It would be helpful if the authors provide this information.

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Tissue Doppler assessment of left ventricular function in asymptomatic diabetic patients

To the Editor,

Left ventricular diastolic dysfunction (LVDD) is very common in the diabetic population, even in the absence of coronary artery disease, valve pathology, or hypertension. It is an indicator of myocardial damage before heart failure becomes apparent and serves as a predictor of adverse cardiac events. Hence, early identification of myocardial dysfunction and correction of potentially modified risk factors are very important in order to delay the onset of heart failure. Unfortunately, subclinical cardiomyopathy is often still unrecognized in asymptomatic diabetic patients (1). Tissue Doppler imaging (TDI) is a non-invasive cardiac imaging technique that measures the velocity of the longitudinal motion of the mitral annulus and has the capability for early detection of LVDD (2).

A total of 48 patients were included in a cross-sectional, single-center study. Twenty-five asymptomatic patients with diabetes mellitus type 2 (DM) comprised the target (diabetic) group, and the control group included 23 patients with hyperlipidemia and obesity but without DM. All patients underwent echocardiographic analysis [conventional pulsed-wave (PW) Doppler echocardiography and TDI] of left ventricular function. We compared the results of both techniques and demonstrated that TDI is superior to PW Doppler in early detection of subclinical left ventricular diastolic dysfunction ($z=2.02$; $p<0.04$).

Also, we noted statistically significant reduction of E´ wave in diabetic group versus control group ($p<0.04$). The advantages of TDI over PW Doppler have also been demonstrated in other studies (3).

We evaluated the relationship of LVDD to various risk factors: age, gender, duration of DM, glycated hemoglobin (HbA1c), lipid profile, and obesity indices body mass index (BMI), body surface area (BSA), and waist-to-hip ratio (WHR).

Patients with poor glycemic control (HbA1c >7%) had higher prevalence of LVDD than patients with HbA1c <7% ($z=-4.3$; $p<0.004$). LVDD was significantly higher in patients with longer duration of DM (up to 5 years) ($p<0.001$), in patients older than 40 years of age ($p<0.000$), in female gender ($p<0.001$), and obesity indices of BMI and BSA ($p<0.000$; $p<0.000$). Statistically significant relationship was also found in control group between LVDD and age, female gender, and obesity indices of BMI and WHR ($p<0.002$; $p<0.004$; $p<0.002$; $p<0.003$).

Our findings are comparable to other studies. Rodríguez-Vigil et al. (4) also confirmed relationship between cardiovascular complications and gender, age, disease duration, and glycemic control in diabetic patients.

Although many studies suggest correlation between hyperlipidemia and LVDD, our analysis did not confirm this relationship in both groups ($p<0.1$ for diabetic and $p<1$ for control group) (5). We have no clear explanation why this was so, but if we take into consideration the fact that patients with good glucose regulation have a lower rate of LVDD, we can assume that it may be due to the treatment. Namely, the majority of study subjects with dyslipidemia were already on statins.

Our study supports the assumption that detection of subclinical LVDD and initiation of early treatment for potentially modifiable risk factors will delay the progression to heart failure and will improve the outcome of diabetic cardiomyopathy.

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