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Predictors of left ventricular diastolic dysfunction in type 2 diabetes patients: a 4-year prospective study

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Letter to the editor

Patients with type 2 diabetes mellitus (T2DM) may develop a cardiomyopathy characterized by left ventricular diastolic dysfunction (LVDD) at the early stages, often called diabetic cardiomyopathy [1,2]. According to the results of a study, among T2DM patients with good glycemic control, 47% were found to have diastolic dysfunction [3]. High sensitivity C-reactive protein (hsCRP) has been related with subclinical LVDD in patients with cardiovascular (CV) risk factors [4]. Therefore, the aim of the present study was to determine possible risk factors that could predict the new onset of LVDD within 48 months of follow up in a T2DM patient cohort.

We enrolled 48 patients (26 males) with T2DM [mean age (±standard deviation, SD): 55.4±10.0 years, HbA1c: 7.5±1.5%, body mass index (BMI): 29.4±5.1 Kg/m^2, T2DM duration: 6.8±0.8 years] with normal both systolic and diastolic cardiac function that were followed up for 48 months. Exclusion criteria were coronary artery disease, inflammatory states and active malignancy. Demographic characteristics and medical history were recorded and fasting blood samples were analysed for B-type Natriuretic Peptide (BNP), soluble ST2, hsCRP, HbA1c, glucose and lipid profile at baseline visit. All subjects underwent resting transthoracic 2-dimensional echocardiography and doppler imaging to assess LVDD, left ventricular myocardial index (LVMI) and left ventricular mass at baseline and yearly for 48 months. Echocardiography (and especially Tissue Doppler Imaging) was used to diagnose subjects with left ventricular systolic and/or diastolic dysfunction (according to the revised guidelines of A.C.C. / A.H.A. 2009). Studies were performed on a Vivid 7 echocardiography machine (Vingmed, Norway). All measurements were made by a single experienced echocardiographer blinded to the diabetic status of the patients according to the ASE recommendations for chamber quantification 20051. The LV ejection fraction was estimated using the Simpson biplane method. From the mitral inflow profile, the E- and A-wave peak velocities and DT were measured. The E' velocity from the septal and lateral mitral valve annulus and the mean value were determined, and the respective E/E' ratios were derived. An E/E'septal ratio >15 was considered indicative of elevated LV filling pressure. Diastolic function was categorized using mitral inflow and Doppler Tissue Imaging parameters.

At baseline 41.7% of study recruits had arterial hypertension, 45.8% dyslipidemia and 45.8% were current smokers. The majority of study patients were on oral antihyperglycemic agents (OADs) (95.8%); 91.7% metformin, 27.1% sulfonylurea, 8.3% dipeptidyl peptidase 4 (DPP-4) inhibitors and 8.3% glinides. Regarding the anti-hypertensive therapy, 18.8% were on angiotensin-converting-enzyme (ACE) inhibitors, 16.7% on angiotensin receptor blockers (ARBs), 4.2% on diuretics and 4.2% on beta-blockers.