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Determinants of early subclinical systolic dysfunction in patients with type 2 diabetes

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Aim: Type 2 Diabetes (DM2) is a risk factor for the development of heart failure (HF). Global longitudinal strain (GLS) is more sensitive than ejection fraction (EF) in diagnosing subclinical left ventricular systolic dysfunction (LVSD). Metabolic-associated fatty liver disease has been involved in the development of subclinical LVSD-GLS. However, determinants of subclinical LVSD-GLS in DM2 remain poorly known. Our aim was to identify variables associated with altered GLS values in a cohort of DM2 individuals without heart disease and with normal EF.

Methods: The study was performed on DM2 patients (n=150) recruited in the TESEO cohort study with available data on GLS (Speckle Tracking Echocardiography, Epiq CVx Philips), hepatic steatosis (CAP), and liver stiffness (LS) (Fibroscan). Subjects with symptomatic HF, cardiovascular disease (CVD), other heart diseases, EF<50%, eGFR<30 ml/min/1.73 m², alcohol abuse, non-metabolic liver disease, and hepatic cirrhosis were excluded. Multiple regression and logistic regression analyses were used to identify GLS determinants and variables associated with subclinical LVSD-GLS (GLS≥-18%).

Results: Recruited subjects (age 61.39±7.89 years, male 57.3%) had a short DM2 duration (3.93±5.06 years) and good metabolic control (HbA1c 6.57%±1.00). Subclinical LVSD-GLS was present in 20% of subjects. Patients with LVSD-GLS had significantly higher LS values (5.77±1.75 vs 4.94±1.25, p=0.003). In multivariate regression analysis, LS values were a significant determinant of GLS, independent of age, waist circumference, diabetes duration, blood pressure, and e' lateral. In logistic regression analysis, LS was associated with a 61% (95% CI 1.15-2.25) increased OR of LVSD-GLS independent of age, gender, WC, diabetes duration, blood pressure, ACR, LVH, and e' lateral.

Conclusions: This study demonstrated that LS is independently associated with LVSD-GLS in DM2 patients with normal HF and without CVD. Abnormal LS values may identify a subgroup of DM2 patients at higher risk of symptomatic HF, who may benefit from closer clinical and echocardiographic monitoring.

SELECTED ABSTRACTS

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