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Increased epicardial fat and early signs of impaired diastolic and systolic left ventricular function in non-diabetic, non-dyslipidemic, normotensive patients with Nonalcoholic Fatty Liver Disease

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Fatty liver disease

Clinical

INCREASED EPICARDIAL FAT AND EARLY SIGNS OF IMPAIRED DIASTOLIC AND SYSTOLIC LEFT VENTRICULAR FUNCTION IN NON- DIABETIC, NON-DYSLIPIDEMIC, NORMOTENSIVE PATIENTS WITH NONALCOHOLIC FATTY LIVER DISEASE

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Background and Aims: Nonalcoholic Fatty Liver Disease (NAFLD) has been associated with subclinical cardiovascular disease (CVD) and increased CVD morbidity and mortality. This study was undertaken to 1) ascertain whether NAFLD patients have abnormal epicardial fat, left ventricular (LV) morphology and function, 2) determine the relative contribution of epicardial, visceral and hepatic fat to LV dysfunction.

Methods: Nineteen non-diabetic, non-dyslipidemic, non-hypertensive patients with biopsy-proven NAFLD (17 men, age 41±8 years, BMI 26.8±3kg/m²) and 9 healthy controls (5 men, age 30±2 years, BMI 22.5±2kg/m²) underwent transthoracic echocardiography and cardiac MRI to quantify epicardial fat and cardiac morphology and function. An abdomen MRI was performed in all subjects to quantify visceral and hepatic fat.

Results: The end-systolic LV diameter (30.4±3.7 vs 27.2±3.5 mm, p=0.044) and the left atrial area (19.6±3.3 vs 14.9±2.5 cm², p=0.02) were significantly higher in patients than in controls. Indices of LV diastolic function, namely the early diastolic septal and lateral mitral annular velocities, were significantly impaired in NAFLD (9.7±2.6 vs 12.9±2.57 and 13.3±3.5 vs 16.4±1.6 cm/s, vs controls respectively; p<0.03 for both). Similarly, the ratio of early to late diastolic mitral inflow (E/A ratio) was significantly reduced in patient than in controls (1.2±0.2 vs 1.5±0.2, p=0.004) suggesting an early diastolic dysfunction. Epicardial fat in NAFLD patients was significantly increased compared to controls, both at echocardiography and at MRI (5.93±2.25 vs 0.26±0.5 mm, 228.1±112.8 vs 66.8±25.2cm³, respectively, p=0.001). In NAFLD patients, but not in controls, epicardial fat positively correlated with end-systolic LV diameter (r=0.46, p=0.046) and inversely with the ejection fraction (EF). Epicardial fat was tightly related to visceral fat (r=0.58, p=0.03), but not to hepatic fat. Visceral fat inversely correlated with EF, whereas hepatic fat directly correlated with the end systolic LV volume (r=0.63, p=0.004).

Conclusions: Non diabetic, non-dyslipidemic, normotensive NAFLD patients show early signs of both diastolic and systolic LV dysfunction. Epicardial, visceral and hepatic fat are increased and associated with parameters of early systolic dysfunction.

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