Epicardial adipose tissue is associated with an increased risk of mortality and hospitalizations in patients with heart failure with preserved ejection fraction

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Background: Accumulating evidence suggests that epicardial adipose tissue (EAT) plays a critical role in heart failure (HF). Previous studies raised the possibility of an association with mortality and hospitalizations, but data in preserved ejection fraction (HFpEF) is sparse.

Purpose: To investigate the association of epicardial fat measured by cardiac magnetic resonance imaging (CMR) with the combined end point of heart failure hospitalizations and cardiovascular death in patients with heart failure with preserved ejection fraction

Methods: In this secondary analysis of a prospective cohort study recruiting participants with HFpEF between July 2012 and March 2018 at a tertiary care centre. Patients with cardiac amyloidosis were excluded. The combined primary endpoint of this analysis consists of heart failure hospitalizations and cardiovascular mortality. The statistical analysis plan consisted of a Cox proportional hazard regression adjusted for multiple potential confounders. Adjustments were predefined and selected by their clinical relevance. EAT volume was measured using a modified Simpson rule, EAT area was measured in the four-chamber view. EAT was defined from visceral (immediately adhering the myocardium) to the parietal layer of the pericardium. Epi-pericardial tissue was excluded. We used dark blood steady-state free precision (SSFP) at end-diastole. If unavailable we used bright blood SSFP or true fast imaging with steady-state free precession.

Results: We studied 206 patients (69% women, mean age 71±9 years, median N-terminal prohormone of brain natriuretic peptide [NT-proBNP]: 1090 IQR 420 – 1997pg/mL). During mean follow-up of 78±35 months, 78 patients (37%) died of a cardiovascular cause. In multivariate analysis adjusting for age, gender, atrial fibrillation, left-ventricular ejection fraction (EF), right ventricular (RV) end-diastolic volume index, RVEF and NT-proBNP, EAT was significantly associated with a higher risk of the composite outcome (HR 1.07 [95% CI 1.02-1.12], P = 0.007). Additional adjustments for hepatic-, renal- and pulmonary function as well as metabolic biomarkers did not materially change the results. There was no statistically significant association with pulmonary pressures on right heart catheterization.

Conclusions: EAT accumulation is associated with increased risk for mortality and hospitalizations in patients with HF with preserved ejection fraction. This finding supports the rational for future interventional studies of EAT in HFpEF.

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