Abstract Session -- Young Investigator Award session

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Pulmonary transit time is a better predictor of cardiovascular mortality and HF hospitalization in HF-rEF patients than left and right ventricular ejection fraction or feature tracking GLS

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Background: Right ventricular (RV) ejection fraction and hemodynamic congestion are known as powerful predictor of mortality in HF-rEF. Pulmonary transit time (PTT) assessed by cMR is a novel parameter, which reflects multiple indicators of cardiopulmonary status, including not only left ventricular(LV) and RV function but also hemodynamic congestion.

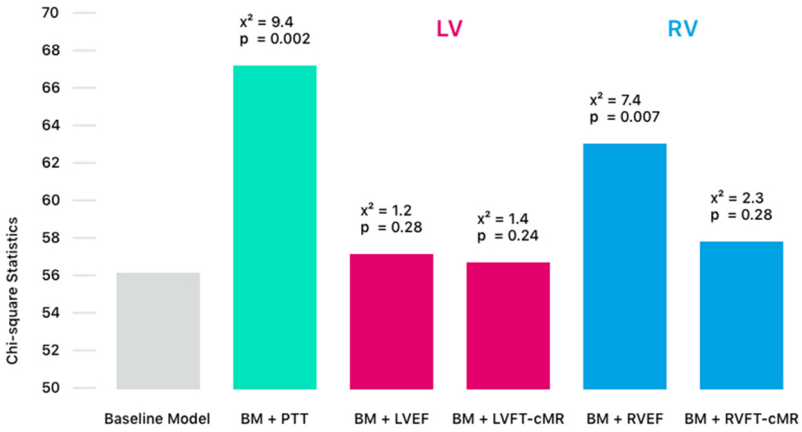
Purpose: We sought to explore the prognostic value of the PTT above well-known risk factor for predicting outcomes in HF-rEF in direct comparison with cardiac function assessed either by the conventional cMR-systolic parameters or by cMR-feature tracking (FT).

Methods: 401 patients in sinus rhythm with a LVEF< 35% (age 61 ± 13 years; 25% female) underwent a cMR and an echocardiography. Patients were followed for a composite endpoint of CV death and HF hospitalization.

Results: Average cMR-LVEF was 23% ± 7%, average cMR-RVEF was 43 ± 15%, average cMR-FT-RVGLS was -12 ± 4.4%, average cMR-FT-LVGLS was-6.5 ± 2.5% average estimated systolic pulmonary pressure (eSPAP) was 33 ± 12mmHg and PTT was 11± 6s. After a median follow-up of 6 years, 191 (48%) patients reached the composite endpoint. In univariate cox regression, age, female sex, ischemic cardiomyopathy, diabetes, NYHA class III-IV, eSPAP> 40mmHg, E/A ratio, e/e'ratio, cMR-RVEF, LVEF, LV scar, PTT, GFR, beta blockers and diuretics were associated with the composite endpoint. For the multivariate analysis, a baseline model was created where age, female sex, ischemic etiology, diabetes, eSPAP > 40mmHg, diuretics, beta blockers were found to be significantly associated with the endpoint. PTT (X2 to improve = 9.41, HR: 1.04; 95%CI: [1.02; 1.06]; P = 0.002) showed a significantly higher additional prognostic value over the baseline model than cMR-LVEF (X2 to improve = 1.15, HR: 0.99; 95%CI: [0.97; 1.01]; P = 0.28), cMR-RVEF (X2 to improve = 7.36, HR: 0.99; 95%CI: [0.97; 0.99]; P = 0.007), LV-FT-cMR(X2 to improve = 1.36, HR: 1.03; 95%CI: [0.98; 1.08]; P = 0.24) and RV-FT-cMR (X2 to improve = 2.32, HR: 1.03; 95%CI: [0.99; 1.06]; P = 0.28).

Conclusion: Pulmonary transit time provides higher prognostic information than cardiac function assessed by cMR or by cMR feature tracking over well-known risk factors with high power to stratify prognosis in HF-rEF and might be promising tools to identify patients at higher risk among HF patients.

Abstract 203 Figure.



The additional value of the pulmonary transit time (PTT), left ventricular ejection fraction (LVEF), left ventricular feature tracking cardiac magnetic resonance (LVFT-cMR), right ventricular ejection fraction (RVEF) and right ventricular feature tracking (RVFT) over a baseline model (BM) including age, female sex, ischemic etiology, diabetes, estimated systolic pulmonary pressure >40mmHg, diuretics and beta blockers in predicting cardiovascular death and heart failure hospitalization. LV and RV indicate left ventricle and right ventricle respectively.

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