Abstract: P982

Arrhythmogenic atrial substrate in suspected heart failure with preserved ejection fraction: implications for development of future atrial fibrillation

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Topic(s):
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Introduction: Atrial fibrillation (AF) increases morbidity and mortality in heart failure with preserved ejection fraction (HFpEF), yet identification of arrhythmia-naïve HFpEF-patients at highest risk to develop new-onset AF is challenging. Amplified p-wave duration >150 ms (APWD) was previously demonstrated to non-invasively identify arrhythmogenic atrial substrate with high sensitivity and specificity.

Purpose: To investigate the importance of APWD to predict new-onset AF in HFpEF.

Methods: Ninety-nine consecutive patients with symptomatic heart failure and left ventricular ejection fraction >50% underwent exercise testing with concomitant right-heart catheterization, left-heart catheterization and echocardiography. Significant arrhythmogenic atrial substrate was diagnosed when APWD was >150 ms. Patients without history of AF (n=87) were followed for new-onset AF in 6-12 months intervals.

Results: 87% of patients with advanced HFpEF (pulmonary capillary wedge pressure [PCWP] at rest >12 mmHg) had evidence of arrhythmogenic atrial substrate (figure 1; APWD 175±29 ms vs. 132±14 ms with PCWP<12 mmHg, p<0.0001). The presence of arrhythmogenic atrial substrate as evidenced by an APWD >150ms was associated with a ten-fold increased risk for new-onset AF during a 4.6 years follow-up (hazard ratio [HR] 9.684, 95% CI: 2.61-35.89, p<0.0001), comparable to advanced HFpEF (HR 7.20, 95% CI 2.24-23.10, p<0.001). Early HFpEF with normal resting PCWP, but pathological increase to exercise >25.5 mmHg/W/kg was not related to arrhythmogenic atrial substrate (figure 1; APWD 131±13 ms vs. 134±15 ms with normal pressures, p=0.395) and did not carry an elevated risk for incident AF (HR 3.44, 95% CI: 0.57-20.72, p=0.178).

Presence of arrhythmogenic substrate was independent of left atrial indexed volume (LAVI) and largely (85,7%) occurred in normal sized atria (LAVI <34ml/m2). LAVI did not predict future AF (HR 2.099, 95% CI: 0.27-16.27, p=0.478).

Conclusions: APWD-analysis identifies arrhythmogenic atrial substrate in a large part of of HFpEF-patients, who carry an incremental risk to develop future AF.
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Figure 1