

Atrial function discriminates paroxysmal AF patients with HFpEF from those without HFpEF: subanalysis from AF-RISK study

Artola V.¹; Santema B.¹; De With R.¹; Nguyen B.¹; Linz D.²; Schotten U.³; Van Gelder I.¹; Crijns H.¹; Voors A.¹; Rienstra M.¹

¹University Medical Center Groningen, Groningen, Netherlands (The)

²Maastricht University Medical Centre (MUMC), Cardiology, Maastricht, Netherlands (The)

³Cardiovascular Research Institute Maastricht (CARIM), Maastricht, Netherlands (The)

Funding Acknowledgements: Type of funding sources: Public grant(s) – EU funding. Main funding source(s): European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie. Grant support from the Dutch Heart Foundation [NHS2010B233]

Background. Atrial fibrillation (AF) and heart failure with preserved ejection fraction (HFpEF) are two cardiovascular conditions that often coexist. Overlapping symptoms, biomarker profile, and echocardiographic changes hinder the diagnosis of underlying HFpEF in patients with AF and suggest that both conditions might reflect similar remodelling processes in the heart.

Purpose. To assess cardiac remodelling in AF patients with versus without concomitant HFpEF by transthoracic echocardiography, focusing on atrial dimension and strain.

Methods. We selected 120 patients included in AF-RISK, a prospective, observational, multicentre study aiming to identify a risk profile to guide atrial fibrillation therapy study. Patients had paroxysmal AF diagnosed within three years before inclusion, had a left ventricular ejection fraction (LVEF) $\geq 50\%$ and were in sinus rhythm at the moment of performing echocardiography and blood sampling. Patients were matched by nearest neighbour by age and sex with a 1:1 ratio and were classified into two groups: 1) AF with HFpEF (n = 60) and 2) AF without HFpEF (n = 60). The diagnosis of HFpEF was based on the 2016 ESC heart failure guidelines, including symptoms and signs of heart failure, N-terminal pro-B-type natriuretic peptide (NT-proBNP) $\geq 125\text{pg/ml}$, and one of the following echocardiographic measures: left atrium volume index (LAVI) $>34\text{ml/m}^2$, left ventricular mass index $\geq 115\text{g/m}^2$ for men and $\geq 95\text{g/m}^2$ for women, average $E/e' \geq 13\text{cm/s}$ and average $e' < 9\text{cm/s}$. Measurements of reservoir, conduit and contraction strain of both atria were performed in apical four-chamber by echocardiography (GE, EchoPac BT12). Associations of clinical and echocardiographic characteristics were tested for collinearity by multivariable logistic regression analyses. LAVI, LV mass index and NT-proBNP were excluded from multivariable analysis since these markers were part of the HFpEF diagnostic criteria.

Results. Patients with paroxysmal AF and concomitant HFpEF had more often hypertension (72% vs. 45%, $P = 0.005$), had more impaired strain phases of both the left and right atria (figure 1), had comparable LVEF and global longitudinal strain (GLS) ($P = 0.168$ and $P = 0.212$, respectively). In a model adjusted for the number of comorbidities and sex, LA contraction decrease was associated with presence of HFpEF (odds ratio per 1% LA contraction-percent was 0.94, 95% confidence interval 0.87–0.99, $P = 0.042$). LA contraction was not explained by LAVI in patients with concomitant HFpEF (Spearman’s rho = -0.07, $P = 0.08$). Conclusion. Our results show that atrial function may differentiate paroxysmal AF patients with HFpEF from those without HFpEF. In patients with paroxysmal AF, more impaired strain phases of the left and right atria were associated with concomitant HFpEF, whereas ventricular function, reflected by LVEF and GLS, did not differ.

Abstract Figure. Strain distribution of both atria

