Inter-atrial block and atrial fibrillation predict cardiac adverse events in heart failure with preserved ejection fraction

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Background: Atrial fibrillation (AF) is a prognostic risk-factor in heart failure with preserved ejection fraction (HFpEF). Earlier stages of atrial dysfunction identified by the ECG, particularly inter-atrial block (IAB), may provide additional risk predictions in HFpEF patients in sinus rhythm.

Purpose: To assess the prevalence of IAB in patients diagnosed with HFpEF compared to non-HFpEF, and to evaluate the prognostic association of IAB and AF in patients diagnosed with HFpEF.

Methods: Consecutive symptomatic patients referred for a systematic diagnostic work-up to rule-in or rule-out HFpEF were included. The diagnosis of HFpEF was based on current guidelines (including HFA-PEFF and H2FPEF algorithms) and confirmed by consensus of multiple experienced HF specialists. Patients in whom HFpEF was ruled-out were included as non-HFpEF. We excluded patients with cardiac valve interventions before or up to 1 year after baseline, or with paced rhythm during IAB assessment. ECGs at baseline were assessed in detail for P-wave duration, morphology, and presence of IAB using digital calipers by investigators blinded to clinical data. IAB was defined based on a P-wave duration of >120ms. Patients with HFpEF and non-HFpEF were grouped into either i) AF based on ECG or medical history, ii) IAB based on ECG, or iii) no IAB or AF based on ECG. Adverse events were evaluated only in HFpEF patients and included HF hospitalization, cardiac or sudden death, and a composite of both.

Results: 372 patients with HFpEF and 68 non-HFpEF were included (females: 67.7% vs. 64.7%, p = 0.726; mean age: 75±7 vs. 67±10 years, p<0.001). AF was more common in HFpEF than non-HFpEF (64.8% vs. 23.5%, p<0.001). In sinus rhythm, presence of IAB was comparable between HFpEF and non-HFpEF (87.0% vs. 80.8%). During a mean follow-up of 3.2±1.6 years in HFpEF patients, more adverse cardiac events were observed when AF was present (23.7%, HR 10.6 [95%CI 1.5-1334.4]) compared to IAB (10.5%, HR 4.2 [95%CI 0.56-542.6]) and no IAB (0%), p = 0.0004 (Figure 1). Pairwise comparisons confirmed these observations: AF vs. IAB p = 0.006, AF vs. no IAB p = 0.031. In HFpEF patients with sinus rhythm, a trend was found for more adverse events when IAB was present versus no IAB (p = 0.06).

Conclusion: Patients with HFpEF have a higher prevalence of AF and similar prevalence of IAB compared to symptomatic patients ruled-out for HFpEF. Presence of IAB or AF in HFpEF may predispose to adverse cardiac events in patients without severe valve disease. IAB may enrich cardiac risk stratification in addition to AF in HFpEF.
Adverse cardiac events in HFpEF patients based on inter-atrial block and atrial fibrillation

Survival curves for no IAB, IAB, and AF