



## Editorial

## Is rhythm control superior to rate control in patients with heart failure and preserved ejection fraction?☆

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**Keywords:**

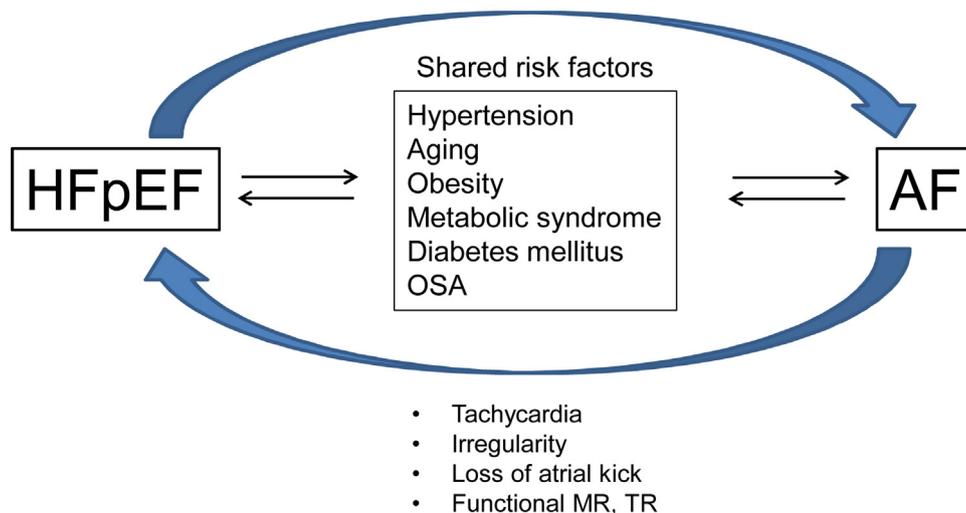
Atrial fibrillation  
Catheter ablation  
Heart failure with preserved ejection fraction  
Sinus rhythm

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Heart failure with preserved ejection fraction (HFpEF) and atrial fibrillation (AF) has increased with aging populations in developed countries. Prevalence of AF was reportedly higher in patients with HFpEF than in those with HF with reduced EF (HFrEF), and comorbid AF and HFpEF appears to be associated with high

morbidity and mortality [1]. AF and HFpEF share risk factors such as hypertension, aging, obesity, metabolic syndrome, diabetes mellitus, and obstructive sleep apnea (Fig. 1). HF-related atrial remodeling causes conduction disturbance that facilitates AF. AF itself can be involved in the development of HFpEF due to tachycardia, irregularity, left atrial fibrosis, and left atrial dysfunction [2,3]. AF is also associated with left ventricular fibrosis, which contributes to diastolic dysfunction and HFpEF. Atrioventricular annular remodeling with progressive mitral and tricuspid regurgitation may be another mechanism by which AF causes HFpEF. Although evidence-based treatment guidelines for both HF and AF exist, consensus treatment strategies are less clear for comorbid AF and HFpEF [4,5]. Recently, evidence has emerged that AF catheter ablation can improve clinical outcomes in patients

- Atrial structural remodeling
- Atrial electrical remodeling
- Calcium handling impairment
- Neurohormonal activation
- Oxidative stress/inflammation



- Tachycardia
- Irregularity
- Loss of atrial kick
- Functional MR, TR

**Fig. 1.** Vicious cycle of development of AF and HFpEF. AF, atrial fibrillation; HFpEF, heart failure with preserved ejection fraction; OSA, obstructive sleep apnea; MR, mitral regurgitation; TR, tricuspid regurgitation.

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with HFrEF [6,7]. However, there have been few observational studies evaluating the utility of AF ablation therapy in HFpEF with AF [8,9].

In this issue of the *Journal of Cardiology*, a retrospective, observational, multicenter study utilizing data from 11 participating institutions was demonstrated to investigate the efficacy and safety of rhythm control therapy mainly by catheter ablation in 283 Japanese HFpEF patients with AF [10]. The authors used a propensity score matched cohort consisting of 79 patients with rhythm control therapy and 79 patients with rate control therapy. In the rhythm control group, 66 (83.5%) patients underwent catheter ablation and 13 (16.5%) patients were treated with only anti-arrhythmic drugs. Over half of patients required repeat ablation procedures. During the median follow-up period of 24 months, there were no differences in all-cause death and cardiovascular death between rhythm control group and rate control group. However, rhythm control therapy significantly reduced HF hospitalization. With respect to cardiac function, rhythm control therapy improved left atrial remodeling, and left ventricular systolic and diastolic function at 12-months of follow-up. Further, rhythm control therapy decreased serum B-type natriuretic peptide levels while rate control therapy did not.

The AFFIRM (Atrial Fibrillation Follow-up Investigation of Rhythm Management) trial revealed no survival advantage of rhythm control compared with rate control strategy in patients with AF, regardless of HF status [11]. Current guidelines of AF management recommend initial rate control therapy with anticoagulation followed by rhythm control therapy in case symptoms of AF persist [12]. AF-CHF (Atrial Fibrillation in Congestive Heart Failure) trial revealed that there was no difference in cardiovascular mortality between rate control and rhythm control with anti-arrhythmic drugs such as amiodarone [13]. On the other hand, a subgroup analysis of the AFFIRM trial suggested that maintaining sinus rhythm was associated with lower mortality [14]. The beneficial effect of rhythm control with anti-arrhythmic drugs in HF was limited because of their low efficacy of maintenance of sinus rhythm and toxicities. In the present study [10], the rates of sinus rhythm maintenance were relatively high (72.2%) in the rhythm control group. A recent meta-analysis showed that AF catheter ablation can improve left ventricular EF, and reduce all-cause mortality, and HF hospitalizations in HFrEF patients with AF [7]. In the recent open-label, multicenter, randomized CABANA trial, a total of 2204 symptomatic patients with AF aged  $\geq 65$  years or  $< 65$  years with 1 or more risk factors for stroke were included to determine whether AF ablation is more effective than conventional medical therapy for improving outcomes [15]. Although AF ablation did not significantly reduce the primary composite end point of death, disabling stroke, serious bleeding, or cardiac arrest compared with medical therapy, AF ablation significantly reduced death or cardiovascular hospitalization. It is suggested that maintenance of sinus rhythm may at least reduce HF hospitalization in patients with HFpEF. Larger prospective randomized trials are needed to fully understand whether catheter ablation can improve clinical outcomes in HFpEF patients with AF.

#### Conflict of interest

The author declares no conflicts of interest.

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