

Editorial



Gender Difference in Catheter Ablation: Atrial Fibrillations from Mars and Venus?

Hee Tae Yu , MD, PhD, and Hui-Nam Pak , MD, PhD

Division of Cardiology, Department of Internal Medicine, Yonsei University Health System, Seoul, Korea

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Correspondence to

Hui-Nam Pak, MD, PhD

Yonsei University Health System, 50-1,

Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea.

E-mail: hnpak@yuhs.ac

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ORCID iDs

Hee Tae Yu

<https://orcid.org/0000-0002-6835-4759>

Hui-Nam Pak

<https://orcid.org/0000-0002-3256-3620>

Conflict of Interest

The authors have no financial conflicts of interest.

Author Contributions

Conceptualization: Pak HN; Data curation: Yu HT, Pak HN; Investigation: Yu HT, Pak HN; Methodology: Pak HN; Project administration: Pak HN; Software: Yu HT; Supervision: Pak HN; Writing - original draft: Pak HN; Writing - review & editing: Yu HT.

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► See the article "Gender-related Difference in Clinical Outcome of the Patient with Atrial Fibrillation after Radiofrequency Catheter Ablation" in volume 48 page on 605.

The prevalence of atrial fibrillation (AF) in Korea is continuously increasing with the elderly society and the survival improvement of the patients with heart disease.¹⁾ In Korea, projected prevalence of AF will increase to 3.5% in 2030, even when population decline is expected, and will increase for a considerable period thereafter.²⁾ From 2006 to 2015, the prescription rate of antiarrhythmic drugs increased by 81% and AF radiofrequency catheter ablation (RFCA) by 110%. The proportion of AF patients receiving active rhythm control is also increasing.²⁾

Then, is there a gender difference in AF management? The prevalence of AF has been known to be higher in males than in women. However, the prevalence of female AF has been increasing steadily with aging: 0.7% in 2006 to 1.4% in 2015.²⁾ AF is linked with an almost 2-fold higher risk of stroke in women compared with men through the meta-analysis of 30 cohort studies.³⁾ Women are more vulnerable to left ventricular (LV) diastolic dysfunction compared to men, especially associated with hypertension.⁴⁾ We have found that LV diastolic dysfunction is associated with reduced left atrial (LA) appendage flow and LA remodeling, and advanced atrial remodeling is related to the risk and event of stroke in patients with AF.⁵⁾ Yu et al.⁶⁾ recently demonstrated that LA remodeling and poor contractile function of LA appendage are more predominant in women than in men among AF patients with stroke risk. Therefore, in women, AF occurs later than in men, but suggests rapid AF progression related to hypertension, LV diastolic dysfunction, and LA remodeling. That is the reason why more aggressive rhythm control might be required in women.

Roh et al.⁷⁾ compared outcomes of AF catheter ablation between men and women by propensity score matching. In this study, there was no difference in the overall rhythm outcome between men and women, but the complication rate was higher in women and AF recurrence rate was higher in women under 55 years of age compared to their counter parts. It has been consistently reported that procedure related complication rates after AF ablation are higher in females than males, which might be associated with heart size and atrial wall thickness.⁸⁾ In the study of Roh et al.,⁷⁾ the higher number of cardiac tamponade after treatment in women than in men supports this hypothesis. The occurrence of major complications during the procedure may also contribute to a high recurrence rate because of the restriction of ablation and complete pulmonary vein isolation.

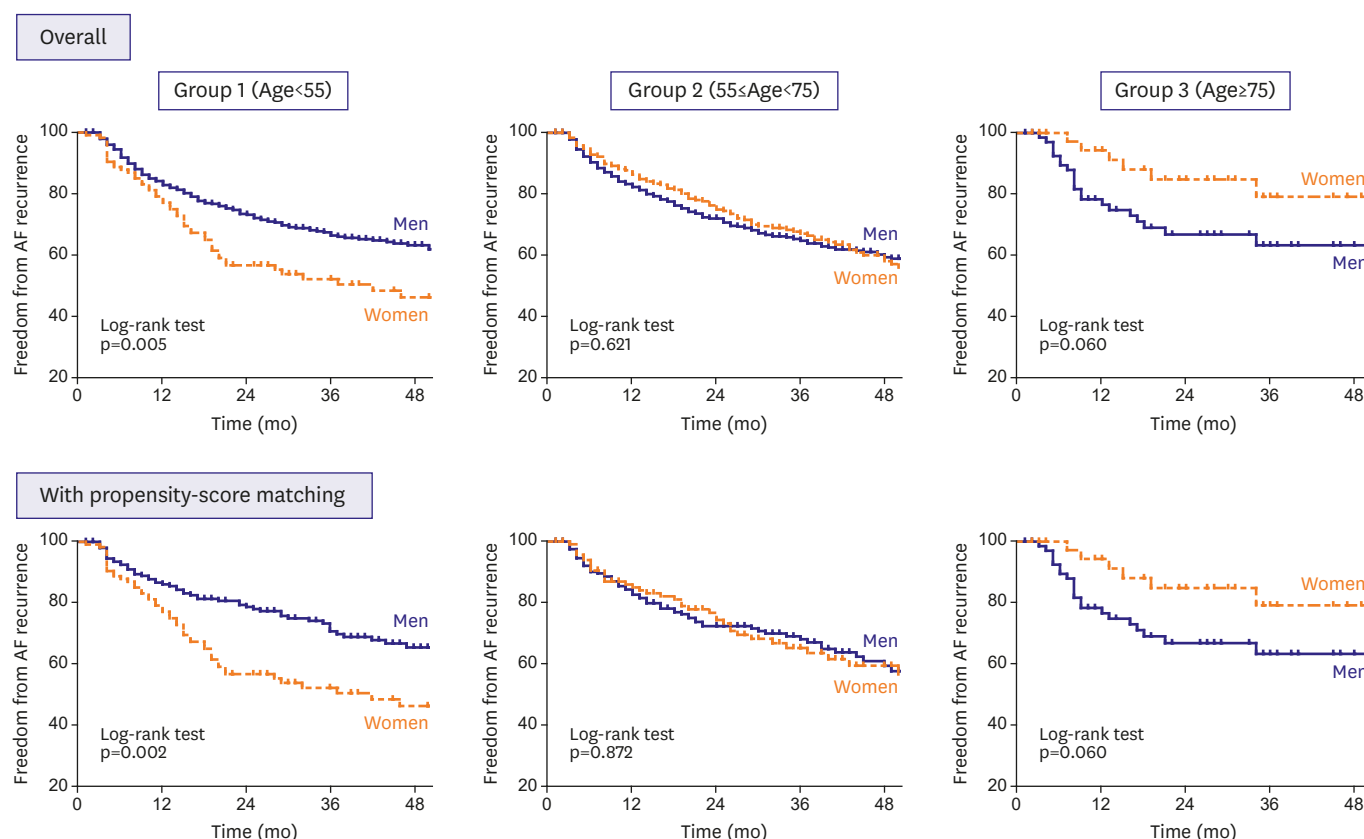


Figure 1. Kaplan-Meier analyses for the differences on atrial fibrillation-free survival between genders in each subgroup of Age<55 (group 1), 55≤Age<75 (group 2), and Age≥75 (group 3) among total population (upper) and propensity score matched population (lower).

Women are less likely to undergo rhythm-control treatment than men. Even among individuals undergoing rhythm-control, women are less likely to undergo catheter ablation.⁹⁾ Previous studies reported higher AF recurrence rate after AF ablation among women, but, those women tended to be older and have a higher prevalence of persistent AF and a longer duration of AF before RFCA. An analysis of our single center experience (unpublished data) also showed that the recurrence rate was higher in women under 55 years of age, but lower in women than in men over 75 years of age after catheter ablation for AF (**Figure 1**).

If so, why is the AF ablation rhythm outcome worse in young female patients? Although Roh et al.⁷⁾ suggested a referral bias as the main cause, the fact that gender differences are present in young women under 55 years of age, those were referred relatively early for ablation, indicates that this explanation is not enough. In contrast, Yu et al.¹⁰⁾ have reported that higher parasympathetic nerve activity in young women is associated with a higher recurrence rate after AF ablation. Another explanation is the early onset AF was identified as a heritable disease, and genetic traits may affect early onset AF differently than AF in elderly patients.

In conclusion, the number of AF patients receiving catheter ablation has been steadily increasing in Korea due to the expansion of medical insurance coverage, reduction of self-pay, simplification of procedures, and development of efficient catheters and mapping systems. The number of female patients receiving AF ablation is expected to grow even more as socioeconomically gender equality increases. More systematic research on AF ablation technique, such as gender specific radiofrequency energy titration, and post-procedural

management is needed for more effective and safe rhythm management for women. We will see if there is still difference in the risk of complications or rhythm outcome after AF catheter ablation even on the day when humans will come and go on Mars and Venus.

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