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Authors: Elisa Hennings, Pascal Meyre

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Beyond the blanking period: Can biomarkers predict early AF recurrence after RFA?

Elisa Hennings[1, 2], Pascal B Meyre[1, 2]

[1]Cardiovascular Research Institute Basel, University Hospital Basel, University of Basel, Basel, Switzerland
[2]Department of Cardiology, University Hospital Basel, University of Basel, Basel, Switzerland

Related article
by Yin et al.

Correspondence to:
Pascal B. Meyre, MD, PhD,
Cardiovascular Research Institute Basel,
University Hospital Basel, University of Basel,
Petersgraben 4, 4031 Basel, Switzerland
e-mail: Pascal.Braun-Meyre@usb.ch

Radiofrequency ablation (RFA) is an established and widely used approach for the management of atrial fibrillation (AF), however, early recurrence of AF (ERAF) within the first three months remains a clinical challenge. The so-called blanking period, traditionally viewed as a phase of myocardial healing and transient arrhythmias, is a subject of ongoing debate. It is regarded as a "grace period" where recurrences do not necessarily indicate procedural failure, nevertheless ERAF may predict long-term recurrence and should not be dismissed [1]. Notably, an expert consensus statement has recently shortened the blanking period from three months to eight weeks, reflecting evolving perspectives on its clinical significance [2]. The study by Yin et al. [3], "Inflammation response post-radiofrequency ablation for atrial fibrillation: implications for early atrial fibrillation recurrence", offers new insights into the role of inflammation in this critical period.

THE ROLE OF INFLAMMATION IN EARLY RECURRENCE OF ATRIAL FIBRILLATION

Yin et al. [3] analyzed 90 patients undergoing RFA, measuring four biomarkers at multiple time points before and after the procedure: high-sensitivity C-reactive protein and fibrinogen, reflecting inflammatory and prothrombotic processes, and creatine kinase isoenzyme and cardiac troponin I, indicating myocardial injury. Their findings showed a significant post-procedural increase in all biomarkers, highlighting the acute inflammatory response and myocardial stress induced by RFA.

The study further assessed the predictive value of the four biomarkers for ERAF. ERAF occurred in 38.9% of patients, underscoring its clinical relevance. They found that elevated levels of all four biomarkers were associated with ERAF in univariate analysis. However, after multivariable adjustment for age, history of hypertension, electric cardioversion, and RF ablation time, only high-sensitivity C-reactive protein remained an independent predictor. This finding strengthens the hypothesis that inflammation plays a key role in atrial remodeling and arrhythmogenesis [4].

IMPLICATIONS FOR POST-ABLATION MANAGEMENT

The study's findings suggest potential strategies for refining post-ablation management. First, given the association between inflammation and ERAF, targeted anti-inflammatory strategies — such as corticosteroids or colchicine — may help mitigate post-ablation inflammation [5, 6]. Biomarker-guided therapy could help identify patients most likely to benefit. Second, patients with persistently elevated inflammatory biomarkers may warrant intensified rhythm monitoring using wearable electrocardiogram technology or continuous telemetry. Third, while RFA remains the dominant strategy, alternative technologies such as cryoballoon ablation and pulsed-field ablation may offer advantages in reducing inflammation and myocardial injury. Pulsed-field ablation, in particular, is gaining attention for its ability to create precise lesions with minimal collateral damage. Comparative studies evaluating inflammatory responses following different ablation modalities could provide valuable insights into optimizing procedural approaches [7].

Limitations

Despite its valuable insights, the study by Yin et al. [3] has limitations. The single-center design and relatively small cohort size suggest that these findings need to be validated in larger, multi-center studies. Additionally, standardized cutoff values for biomarkers are yet to be defined, which is critical for clinical implementation.

CONCLUSION

The study by Yin et al. [3] highlights inflammation as a key factor in post-ablation AF recurrence, challenging the conventional view of the blanking period as merely a phase of transient recovery. If inflammatory biomarkers can reliably predict ERAF, they may serve as critical tools for personalized patient management. Moving forward, large-scale prospective studies are needed to confirm these findings and to define how best to incorporate biomarker data into routine clinical practice.

Article information

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