

## Factors associated with silent cerebral events during catheter ablation for atrial fibrillation in the era of uninterrupted oral anticoagulation therapy

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**Background:** A silent cerebral event (SCE), detected by brain magnetic resonance imaging (MRI), is defined as an acute new brain lesion without clinically apparent neurological deficit, and is frequently observed after catheter ablation in atrial fibrillation (AF) patients. Although the small number of SCEs does not cause neurocognitive dysfunction, the greater volume and/or larger number of SCE lesions are reportedly related to neuropsychological decline; SCE incidence may be a surrogate marker for the potential thromboembolic risk. Thus, strategies to reduce SCEs would be beneficial. Uninterrupted oral anticoagulation strategy for peri-procedural period reportedly reduced the risk of SCEs, but the incidence hovers at 10% to 30%. We sought factors associated with SCEs during catheter ablation for AF in patients with peri-procedural uninterrupted oral anticoagulation (OAC) therapy.

**Methods:** AF patients undergoing catheter ablation were eligible (n=255). All patients took non-vitamin K antagonist oral anticoagulants (NOACs) or vitamin K antagonist (VKA) for peri-procedural OAC (>4 weeks) without interruption during the procedure. Brain MRI was performed within 2 days after the procedure to detect SCEs. Clinical characteristics and

procedure-related parameters were compared between patients with and without SCEs.

**Results:** SCEs were detected in 59 patients (23%, SCE[+]) but not in 196 patients (77%, SCE[-]). Average age was higher in SCE[+] than SCE[-] ( $66 \pm 10$  years vs.  $62 \pm 12$  years,  $p < 0.05$ ). Persistent AF prevalence, CHADS<sub>2</sub>/CHA<sub>2</sub>DS<sub>2</sub>-VASc scores, and serum NT-ProBNP levels increased in SCE[+] vs. SCE[-]. In transthoracic/transesophageal echocardiography, left-atrial dimension (LAD) was larger and AF rhythm/spontaneous echo contrast were more frequently observed in SCE[+] than SCE[-]. SCE[+] had lower initial activated clotting time (ACT) before unfractionated heparin (UFH) injection and longer time to reach optimal ACT (>300 sec) before trans-septal puncture than SCE[-]. In multivariate analysis, LAD, initial ACT before UFH injection, and time to reach optimal ACT were predictors for SCEs.

**Conclusions:** LAD and intra-procedural ACT kinetics affect SCEs during the procedure in patients with uninterrupted OAC for AF ablation. Shortening time to achieve optimal ACT during the procedure may reduce the risk of SCEs.