Pacemaker-detected atrial fibrillation burden and risk of ischemic stroke or thromboembolic events - a cohort study

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Introduction: Atrial fibrillation burden might link to impaired heart function and increased risk of systemic embolism. Current scoring systems for evaluating stroke risks such as CHA2DS2-VASc do not incorporate atrial fibrillation burden partly because of the difficulty to assess these data. Patients with dual-chamber pacemakers implanted have opportunities to acquire incidence and duration of atrial fibrillation. We aimed to evaluate atrial fibrillation burden and its association with thromboembolism in patients with dual-chamber pacemaker.

Methods: This retrospective cohort study enrolled patients who underwent dual-chamber pacemaker implantation at our center between October 2003 and May 2017. We excluded patients with prior thromboembolism or receiving anticoagulants. The incidence and duration of pacemaker-detected atrial fibrillation were compared between patients with and without thromboembolic outcomes. Propensity score matching (1:1) was conducted based on clinical characteristics. Logistic regression and Cox regression were conducted to determine the predictors of thromboembolic outcomes. Survival free from stroke and thromboembolism was assessed using Kaplan-Meier analysis in groups with different atrial fibrillation burden.

Result: Among the 152 patients enrolled (43.4% women; age, 73.2±13.3 years), ten experienced thromboembolic events within a median follow-up of 67 months. Patients with thromboembolisms had higher CHA2DS2-VASc score but not higher atrial fibrillation burden. Higher CHA2DS2-VASc score was associated with increased risk for systemic thromboembolism (hazard ratio, 1.865; 95% confidence interval, 1.073–3.240; P=0.027). In the propensity score-matched cohort with comparable CHA2DS2-VASc score, patients with thromboembolism had higher atrial fibrillation burden. Pacemaker-detected atrial fibrillation was associated with increased risk for thromboembolism (propensity-adjusted hazard ratio, 9.333; 95% confidence interval, 1.193–72.991; P=0.033). Experiencing atrial fibrillation episodes lasting >6 minutes was a predictor of significantly higher risk of a future stroke or thromboembolism (propensity-adjusted hazard ratio, 6.7456; 95% confidence interval, 1.296–35.109; P=0.023).

Conclusion: In patients with dual-chamber pacemakers and comparable CHA2DS2-VASc score, pacemaker-detected atrial fibrillation burden is associated with elevated risk for thromboembolism and might warrant intervention.