EDITORIAL

Postoperative Atrial Fibrillation: The Challenge of Risk Prediction

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Editorial related to the article: Left Atrial Size Contribution to the Predictive Capacity of Two Scores for Atrial Fibrillation in the Postoperative Period of Cardiac Surgeries

Atrial fibrillation (AF) is the most common cardiac arrhythmia in clinical practice and is characterized by chaotic activation of the atrium, with f waves present on baseline electrocardiography. Postoperative atrial fibrillation (POAF) is a clinically important complication in patients who underwent heart surgery (coronary artery bypass grafting, or CABG surgery, or valvular surgery). The prevalence of POAF varies from 20 to 40%, with a peak incidence between days two and four after heart surgery.[1,2] Studies suggest that patients undergoing CABG alone have lower incidence of POAF (10 to 40%) compared with those undergoing CABG combined with heart valve replacement (62%).[3]

The most important risk factors associated with this condition are advanced age, heart failure, rheumatic heart disease, hypertension, previous history of AF, left atrial enlargement, chronic kidney failure, and chronic obstructive pulmonary disease (COPD).[4]

Although the POAF was initially recognized as a benign complication, several studies showed that AF in this circumstance is associated with higher mortality rates at short- and long-term follow-up.[5] The occurrence of POAF is associated with a significant increase in hospitalization time and overall costs.[1]

The $CHADS_2$ and CHA_2DS_2VASc scores are commonly used methods to predict the occurrence of thromboembolic events in AF patients. In 2014, Sareh et al.[6] reported that 344 (16.2%) out of a total of 2,120 patients developed de novo POAF during their primary hospitalization.

$CHDAS_2$ score were calculated, and patients were grouped into three groups: low (0), intermediate (1) and high risk ($\geq$ 2). A multivariate regression model was developed to account for known risk factors of AF. $CHADS_2$ score was a significant predictor of AF in multivariate regression analysis (adjusted odds ratio, 1.26; 95% confidence interval, 1.14-1.40). Compared with the low-risk group, the intermediate-risk and high-risk groups had a 1.73- and 2.58-fold increase in the odds of developing POAF, respectively ($p < 0.02$ and $p < 0.0001$). The authors concluded that patients with a $CHADS_2$ score of $\geq$ 2 have a higher probability of developing AF compared with those with a score of < 2. This scoring system could be used to develop a targeted prophylaxis strategy to reduce AF after cardiac surgery.[6]

In another recent study, Burgos et al.,[7] compared the performance of the CHA_2DS_2VASc, POAF, and HATCH scoring systems to predict new-onset atrial fibrillation after cardiac surgery. A total of 3,113 patients underwent cardiac surgery during the study period. Twenty-one percent (n = 654) had postoperative atrial fibrillation. The authors concluded that POAF, CHA_2DS_2-VASc, and HATCH scoring systems showed good discrimination and calibration to predict postoperative AF in cardiac surgery patients. Among them, the CHA_2DS_2-VASc score showed the best discriminative ability for postoperative AF, with the advantage of being easy to calculate, and hence a useful tool to identify low-risk patients during the preoperative period.

In this issue of the International Journal of Cardiovascular Sciences, Silva et al.,[8] evaluated the predictive capacity of the $CHADS_2$ and $CHAD_2DS_2VASc$ scores, alone or combined with left atrial (LA) size, for the onset of POAF in patients undergoing CABG and/ or valvular surgery. They performed a retrospective

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cohort study on 144 patients and tried to identify the cut-off values of the $CHADS_2$ and CHA_2DS_2VASc scores and LA size to calculate sensitivity, specificity, predictive value positive (PVP), and predictive value negative (PVN), in addition to regression models. In this population, half developed POAF. In the POAF group, patients were older, had reduced left ventricular ejection fraction and longer hospital length of stay. However, the $CHADS_2$ and CHA_2DS_2VASc score alone or in combination with LA size did not show good predictive capacity for POAF. The results of the study by Silva et al.,[8] are in agreement with the findings

observed in a recent meta-analysis[9] including 36,834 patients. The authors concluded that older age and history of heart failure were significant risk factors for POAF consistently, regardless of the design of the study included, i.e., whether prospective or retrospective.

It is worth mentioning that the study has several limitations, since it is a retrospective, single-center study, with a relatively small sample and based on data analysis. However, left atrial size is an important marker of AF and a potential predictor of POAF and needs to be evaluated in future studies.

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