Journal of Interventional Cardiac Electrophysiology (2022) 65:595–596
https://doi.org/10.1007/s10840-022-01366-y

COMMENTARY

CHA_2DS_2-VASc: time to settle the score?

Rachel M. Kaplan[1] · **Jeremiah Wasserlauf**[2]

Received: 28 August 2022 / Accepted: 30 August 2022 / Published online: 15 September 2022

For years, the CHA_2DS_2-VASc score (and its predecessor the $CHADS_2$ score) has been a bedrock of stroke risk prediction in atrial fibrillation (AF). With its straightforward calculation based on easily determined clinical risk factors, the CHA_2DS_2-VASc score has been evaluated for its ability to predict numerous other conditions — from mortality in patients with acute coronary syndrome to adverse events in hospitalized patients with COVID-19 infection [1, 2]. In this edition of the *Journal of Interventional Cardiac Electrophysiology*, Lohrmann et al. describe their evaluation of the CHA_2DS_2-VASc score for its ability to predict recurrence of AF after catheter ablation [3]. By analyzing the combined Optum® and Medtronic CareLink™ database, they identified 632 patients with existing cardiac implanted electronic devices (including insertable cardiac monitors) that subsequently underwent AF ablation. With continuous monitoring and a recurrence threshold of at least 1 h of AF, by 2 years post-ablation, 60–80% of patients had recurrent AF. The group with a CHA_2DS_2-VASc score of at least 5 had the highest rate of recurrence (78.2%). As would be expected in a group with greater background comorbidity, there were more patients with pacemakers and defibrillators than insertable cardiac monitors. This study reinforces what many electrophysiologists would expect: that patients with greater cardiac comorbidities will have more AF even after ablation. This increased rate of recurrence may be associated with structural or electrical remodeling such as greater left atrial dimension or longer duration of persistent atrial fibrillation.

Ultimately though, with a C-statistic of 0.53, the discriminatory ability of the CHA_2DS_2-VASc score for predicting time to recurrent AF was poor. As the authors note, numerous prior scores have been developed with the intent to better predict recurrence of AF, but have generally achieved modest performance at best. Lohrmann's study involved the most thorough available rhythm monitoring but ultimately reached a similar conclusion with respect to the discriminatory properties of the risk prediction score for time to AF recurrence.

A second finding of this study was further support for the reduction in AF burden provided by catheter ablation. The high rate of recurrent AF lasting more than 1 h across all groups may be expected in a predominantly persistent AF group that had rigorous post-ablation rhythm monitoring with implanted devices. Yet with two-thirds of the study cohort having persistent AF, the median burden of AF was reduced from 22 h per day to zero, while the mean burden was reduced from 15–17 h per day to 2–4.5 h per day. Whereas studies such as CIRCA-DOSE demonstrated a marked reduction in AF burden with catheter ablation in patients with a relatively low burden of AF, the present study substantiates a reduction in burden in higher risk patients, particularly with persistent AF [4].

Lohrmann and colleagues should be commended for evaluating the CHA_2DS_2-VASc score in a large ablation population with continuous rhythm monitoring. Even when predicting stroke risk, the CHA_2DS_2-VASc score performs modestly, with a median C-statistic of 0.673 in one meta-analysis [5]. Greater personalization of risk prediction may one day be achieved by looking beyond traditional risk factors. Serum biomarkers; AF features such as burden, density, and duration; left atrial structure and flow dynamics; and machine learning represent a sample of active areas of investigation that hold promise to advance our understanding of stroke risk in AF. Perhaps in the meantime, however, it is best for the CHA_2DS_2-VASc score to stick with its original intent: prediction of stroke risk in AF.

This comment refers to the article available at https://doi.org/10.1007/s10840-022-01326-6

✉ Jeremiah Wasserlauf
Jeremiah_Wasserlauf@rush.edu

[1] Medical University of South Carolina, Charleston, SC, USA

[2] Rush University Medical Center, Chicago, IL, USA

Declarations

Ethics approval Not applicable.

Informed consent This manuscript involved no direct research involving human participants and/or animals. Informed consent is not applicable.

Competing interests The authors declare no competing interests.

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