Validation of Risk Scoring System Excluding Female Sex From CHA2DS2-VASc in Japanese Patients With Nonvalvular Atrial Fibrillation
– Subanalysis of the J-RHYTHM Registry –
Hirofumi Tomita, MD, PhD; Ken Okumura, MD, PhD; Hiroshi Inoue, MD, PhD; Hirotugu Atarashi, MD, PhD; Takeshi Yamashita, MD, PhD; Hideki Origasa, PhD; Eiki Tsushima, PhD on behalf of the J-RHYTHM Registry Investigators

Background: Because the current Japanese guideline recommends CHADS2 score-based risk stratification in nonvalvular atrial fibrillation (NVAF) patients and does not list female sex as a risk for thromboembolic events, we designed the present study to compare the CHA2DS2-VASc and CHA2DS2-VA scores in the J-RHYTHM Registry.

Methods and Results: We prospectively assessed the incidence of thromboembolic events for 2 years in 997 NVAF patients without warfarin treatment (age 68±12 years, 294 females). The predictive value of the CHA2DS2-VASc and CHA2DS2-VA scores for thromboembolic events was evaluated by c-statistic difference and net reclassification improvement (NRI). Thromboembolic events occurred in 7/294 females (1.2%/year) and 23/703 males (1.6%/year) (odds ratio 0.72 for female to male, 95% confidence interval (CI) 0.28–1.62, P=0.44). No sex difference was found in patient groups stratified by CHA2DS2-VASc and CHA2DS2-VA scores. There were significant c-statistic difference (0.029, Z=2.3, P=0.02) and NRI (0.11, 95% CI 0.01–0.20, P=0.02), with the CHA2DS2-VA score being superior to the CHA2DS2-VASc score. In patients with CHA2DS2-VASc scores 0 and 1 (n=374), there were markedly significant c-statistic difference (0.053, Z=6.6, P<0.0001) and NRI (0.11, 95% CI 0.07–0.14, P<0.0001), again supporting superiority of CHA2DS2-VA to CHA2DS2-VASc score.

Conclusions: In Japanese NVAF patients, the CHA2DS2-VA score, a risk scoring system excluding female sex from CHA2DS2-VASc, may be more useful in risk stratification for thromboembolic events than CHA2DS2-VASc score, especially in identifying truly low-risk patients. (Circ J 2015; 79: 1719–1726)

Key Words: CHA2DS2-VASc score; CHA2DS2-VA score; Female sex; Nonvalvular atrial fibrillation; Thromboembolism

Numerous studies have shown that female sex is a risk for thromboembolism in Caucasian patients with nonvalvular atrial fibrillation (NVAF).1–6 Accordingly, recent European and American guidelines recommend the CHA2DS2-VASc score for thromboembolic risk stratification, which includes female sex (Sc) as a risk factor.7,8 However, literature review suggests that female sex as a risk factor is still controversial,9,10 because some studies demonstrated that the odds ratio (OR) or hazard ratio (HR) of female to male sex for thromboembolism is not significant.11–15 Indeed, the recent Canadian guideline states that “female sex should not factor into antithrombotic therapy selection because of the low associated stroke risk and the nonsignificant HR compared with men” and does not use female sex as a risk factor.16 There is also an exception to the use of CHA2DS2-VASc score in the European and American guidelines, whereby female patients aged <65 years without other risk factors (still CHA2DS2-VASc score 1) do not need anticoagulation therapy.7,8

In the Asian population, there have been few studies showing female sex as a risk for thromboembolism.17–21 Our recent subanalysis of the J-RHYTHM Registry also demonstrated that

Received January 25, 2015; accepted April 3, 2015; released online May 13, 2015  Time for primary review: 22 days
Department of Cardiology, Hirosaki University Graduate School of Medicine, Hirosaki (H.T., K.O.); Second Department of Internal Medicine (H.I.), Division of Biostatistics and Clinical Epidemiology (H.O.), University of Toyama School of Medicine, Toyama; Department of Cardiology, Nippon Medical School Tama-Nagayama Hospital, Tama (H.A.); Cardiovascular Institute Hospital, Tokyo (T.Y.); and Department of Physical Therapy, Hirosaki University Graduate School of Health Sciences, Hirosaki (E.T.), Japan
Mailing address: Ken Okumura, MD, PhD, Department of Cardiology, Hirosaki University Graduate School of Medicine, 5 Zaifu-cho, Hirosaki 036-8562, Japan.  E-mail: okumura@hirosaki-u.ac.jp
All rights are reserved to the Japanese Circulation Society. For permissions, please e-mail: cj@j-circ.or.jp
female sex was not a risk for thromboembolism in the Japanese cohort. In fact, the recent revised Japanese guideline has excluded female sex as a risk factor. However, a risk score excluding female sex from the CHA2DS2-VASc score has never been evaluated. The present study aimed to validate the risk scoring system excluding female sex from the CHA2DS2-VASc score (ie, the “CHA2DS2-VA score”) in Japanese NVAF patients without warfarin treatment enrolled in the J-RHYTHM Registry.

Methods

Study Subjects

The J-RHYTHM Registry is an observational cohort study that aims to determine the current status of anticoagulation therapy with warfarin and the optimal anticoagulation levels for preventing thromboembolic events in Japanese AF patients (mean age 69.7 years, n=7,937).

Thromboembolic Risk Stratification

Table 1. Clinical Characteristics Included in the mCHA2DS2-VASc Score and mCHA2DS2-VA Score

<table>
<thead>
<tr>
<th>Acronym Score</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>mCHA2DS2-VASc score</td>
<td>Congestive heart failure/left ventricular dysfunction 1, Hypertension 1, Age (≥75 years) 2, Diabetes mellitus 1, Stroke/TIA 2, Vascular disease (coronary artery disease) 1, Age (65–74 years) 1, Sex category (female) 1</td>
</tr>
<tr>
<td>mCHA2DS2-VA score</td>
<td>Congestive heart failure/left ventricular dysfunction 1, Hypertension 1, Age (≥75 years) 2, Diabetes mellitus 1, Stroke/TIA 2, Vascular disease (coronary artery disease) 1, Age (65–74 years) 1</td>
</tr>
</tbody>
</table>

mCHA2DS2-VA, modified CHA2DS2-VA; mCHA2DS2-VASc, modified CHA2DS2-VASc; TIA, transient ischemic attack.

The CHADS2 score was determined in each patient at enrollment, as previously described. The CHA2DS2-VASc score was also determined according to the 2012 ESC Guidelines for the management of AF, in which V was replaced by coronary artery disease, because the J-RHYTHM Registry stratified thromboembolic risk by CHADS2 score and therefore no data were available regarding peripheral artery disease and aortic plaque. The risk score excluding female sex (St) from the CHA2DS2-VASc score was defined as the CHA2DS2-VA score. Because these risk scores were modified from the original ones, they were defined as the modified CHA2DS2-VASc (mCHA2DS2-VASc) score and the modified CHA2DS2-VA (mCHA2DS2-VA) score, respectively (Table 1).

Table 1

Thromboembolic events occurred in 23 of the 703 male patients (3.3%) and 7 of the 294 female patients (1.2%/year), and no sex difference was found (OR 0.72 for female to male, 95% CI 0.28–1.62, P=0.44) (Figure 2). Even when the patients

Statistical Analysis

Data are expressed as mean±standard deviation or n (%). The unpaired t-test or chi-square test was used to compare differences between 2 groups. The CHADS2, mCHA2DS2-VASc, and mCHA2DS2-VA scores were assessed as a categorical variable (0, 1, 2, and ≥3). The OR and 95% confidence interval (CI) for the annual incidence of thromboembolic events were evaluated. The predictive value of the CHADS2, mCHA2DS2-VASc, and mCHA2DS2-VA scores for thromboembolic events was compared by c-statistic difference and the net reclassification improvement (NRI). Statistical analyses, including the c-statistic analysis, were performed using JMP 10 software (SAS, Cary, NC, USA). The NRI was calculated using R software. A P-value <0.05 was considered statistically significant.

Results

Distribution of the Patients Stratified by Each Scoring System

As shown in Figure 1A, 37% of the study patients were classified into CHADS2 score 1, followed by 29% into score 0 and 21% into score 2. Therefore, 66% of the study patients were classified into CHADS2 scores 0 and 1. On the other hand, only 37% of the patients were classified into mCHA2DS2-VASc scores 0 and 1, and 43% into mCHA2DS2-VA scores 0 and 1 (Figures 1B, C). The difference in the distribution pattern indicates that the mCHA2DS2-VASc and mCHA2DS2-VA scores would be more appropriate for identifying truly low-risk patients.

Clinical Profiles of the Study Patients

Sex differences in each of the clinical profiles of the study patients are briefly summarized in Table 2. Mean age was significantly higher in female than in male patients. There was no sex difference in the type of AF. The CHADS2 and mCHA2DS2-VASc scores were both significantly higher in female patients. Although a 1-point decrease was found in the mCHA2DS2-VASc score in female patients compared with the mCHA2DS2-VASc score by definition, the mCHA2DS2-VA score was still significantly higher in female than in male patients. Antiplatelet use was significantly higher in male than in female patients. Treatment with warfarin was initiated in 234 (23%) patients during the follow-up period and there was no sex difference in the proportion of patients with warfarin initiation.

Annual Incidence of Thromboembolic Events

Thromboembolic events occurred in 23 of the 703 male (1.6%/year) and 7 of the 294 female patients (1.2%/year), and no sex difference was found (OR 0.72 for female to male, 95% CI 0.28–1.62, P=0.44) (Figure 2). Even when the patients
Validation of CHA\textsubscript{2}-DS\textsubscript{2}-VA in Japanese NVAF

Thromboembolic events were analyzed using each risk scoring system. As shown in Figure 3A, there was a significant age effect on the incidence of thromboembolism (OR 2.87 for patients aged 75 years, 95% CI 1.18–8.20, P=0.02), but no interaction between age and sex (P=0.55).

Figure 1. Distribution of NVAF patients stratified by CHADS\textsubscript{2} (A), mCHA\textsubscript{2}-DS\textsubscript{2}-VASc (B), and mCHA\textsubscript{2}-DS\textsubscript{2}-VA (C) scores. The number (%) is shown on each bar. Notably, 66% of the study patients were classified into CHADS\textsubscript{2} scores of 0 and 1 (A), while 37% and 43% were classified into mCHA\textsubscript{2}-DS\textsubscript{2}-VASc scores of 0 and 1 (B) and into mCHA\textsubscript{2}-DS\textsubscript{2}-VA scores of 0 and 1 (C), respectively. mCHA\textsubscript{2}-DS\textsubscript{2}-VA, modified CHA\textsubscript{2}-DS\textsubscript{2}-VA; mCHA\textsubscript{2}-DS\textsubscript{2}-VASc, modified CHA\textsubscript{2}-DS\textsubscript{2}-VASc; NVAF, nonvalvular atrial fibrillation.

Table 2. Sex Differences in the Clinical Profiles of the Study Patients With NVAF

<table>
<thead>
<tr>
<th></th>
<th>Total (n=997)</th>
<th>Male (n=703)</th>
<th>Female (n=294)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>68±12</td>
<td>66±12</td>
<td>71±10</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Type of AF</td>
<td></td>
<td></td>
<td></td>
<td>0.18</td>
</tr>
<tr>
<td>Paroxysmal (%)</td>
<td>603 (60%)</td>
<td>414 (59%)</td>
<td>189 (64%)</td>
<td></td>
</tr>
<tr>
<td>Persistent (%)</td>
<td>108 (11%)</td>
<td>83 (12%)</td>
<td>25 (9%)</td>
<td></td>
</tr>
<tr>
<td>Permanent (%)</td>
<td>286 (29%)</td>
<td>206 (29%)</td>
<td>80 (27%)</td>
<td></td>
</tr>
<tr>
<td>CHADS\textsubscript{2} score</td>
<td>1.3±1.2</td>
<td>1.2±1.2</td>
<td>1.4±1.2</td>
<td>0.007</td>
</tr>
<tr>
<td>mCHA\textsubscript{2}-DS\textsubscript{2}-VASc score</td>
<td>2.3±1.6</td>
<td>1.9±1.5</td>
<td>3.3±1.5</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>mCHA\textsubscript{2}-DS\textsubscript{2}-VA score</td>
<td>2.0±1.5</td>
<td>1.9±1.5</td>
<td>2.3±1.5</td>
<td>0.0005</td>
</tr>
<tr>
<td>History of stroke/TIA</td>
<td>67 (7%)</td>
<td>46 (7%)</td>
<td>21 (7%)</td>
<td>0.73</td>
</tr>
<tr>
<td>Antiplatelet use</td>
<td>577 (58%)</td>
<td>424 (60%)</td>
<td>153 (52%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Warfarin initiation</td>
<td>234 (23%)</td>
<td>168 (24%)</td>
<td>66 (22%)</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Data are shown as mean±standard deviation or n (%). NVAF, nonvalvular atrial fibrillation. Other abbreviations as in Table 1.
Comparison of the Risk Scoring Systems

The predictive value of the CHADS2, mCHA2DS2-VASc, and mCHA2DS2-VA scores for thromboembolic events was compared by c-statistic and the NRI in all patients (n=997). The c-statistic in each risk scoring system was 0.638 (95% CI, 0.534–0.730), 0.595 (95% CI, 0.504–0.680), and 0.624 (95% CI, 0.531–0.709), respectively (Table 3A). Importantly, there was a significant difference in the c-statistic (0.029, Z=2.3, P=0.02) and a significant NRI (0.11, 95% CI 0.01–0.20, P=0.02) between mCHA2DS2-VASc and mCHA2DS2-VA scores, whereas no differences were found in the other combinations of risk scores (Table 3B). To determine the usefulness
cant increase in the annual incidence of thromboembolic events with increasing CHADS2 score (OR 1.65 by 1-category increase, 1.16–2.37, P=0.006). No sex difference was found in this scoring system (OR 0.65 for female to male, 95% CI 0.25–1.46, P=0.31) (Figure 3B). Furthermore, there was a significant increase in thromboembolic events with increasing mCHA2DS2-VASc score (OR 1.43 by 1-category increase, 1.00–2.15, P=0.04) (Figure 4A) and mCHA2DS2-VA score (OR 1.56 by 1-category increase, 1.09–2.31, P=0.01) (Figure 4B). No sex differences were found in both scoring systems (OR 0.51 for female to male in mCHA2DS2-VASc score, 95% CI 0.20–1.20, P=0.13; OR 0.63 in mCHA2DS2-VA score, 95% CI 0.25–1.42, P=0.28) (Figures 4C, D). No thromboembolic events occurred in female patients with mCHA2DS2-VASc score 1 or mCHA2DS2-VA score 0 (n=39). Also, there were no thromboembolic events in female patients aged <65 years with mCHA2DS2-VASc score 2 or mCHA2DS2-VA score 1 (n=23).

Figure 2. Odds ratio of female to male patients in the incidence of thromboembolism among those with nonvalvular atrial fibrillation. Analyses were performed in all study patients and in those divided at the age of 75 years.

Figure 3. Thromboembolic events stratified by CHADS2 score in all nonvalvular atrial fibrillation patients (A) and in male and female patients separately (B). The thromboembolic event rate (%/year) in each category is shown on each bar. CI, confidence interval; OR, odds ratio.
of the *mCHA*2DS2-VASc and *mCHA*2DS2-VA scores for identifying truly low-risk patients, patients with CHADS2 scores 0 and 1 (n=653) were analyzed. The c-statistic in the CHADS2, *mCHA*2DS2-VASc, and *mCHA*2DS2-VA scores was 0.577 (95% CI, 0.451–0.694), 0.632 (95% CI, 0.479–0.763), and 0.631 (95% CI, 0.491–0.751), respectively (Table S1). Although no significant difference in the c-statistic and no significant NRI were found among these risk scoring systems, c-statistic values of both the *mCHA*2DS2-VASc and *mCHA*2DS2-VA score showed a trend to be higher than that of the CHADS2 score. When only patients with *mCHA*2DS2-VASc scores 0 and 1 (n=374) were analyzed, there were a markedly significant difference in the c-statistic (0.053, Z=6.6, P<0.0001) and a significant NRI (0.11, 95% CI 0.07–0.14, P<0.0001) between the *mCHA*2DS2-VASc and *mCHA*2DS2-VA scores (Table 4B).

**Discussion**

**Major Findings**

The present subanalysis of the J-RHYTHM Registry aimed to validate the *mCHA*2DS2-VA score, a risk scoring system excluding female sex from the *mCHA*2DS2-VASc score, in Japanese NVAF patients without warfarin treatment. We found that there was no sex difference in thromboembolic events...
showed that female sex is a risk factor for thromboembolism. Previous cohort studies in Denmark, Sweden, and Canada also showed female sex as a risk factor for thromboembolism. The ATRIA and Framingham studies in the American population showed female sex as a risk factor for thromboembolism; that is, the older age, the higher risk in female patients. However, no sex difference and no such an interaction were found in the present Japanese cohort, although there was a significant age effect on the incidence of thromboembolism.

In contrast, Asian cohort studies in NVAF patients without any antithrombotic therapy in China, Hong Kong, and Taiwan showed that female sex is not a risk factor for thromboembolism (HR 1.92 for female to male in China (n=885), 95% CI 0.66–5.58, P=0.23; HR 1.03 in Hong Kong (n=3882), 95% CI 0.88–1.20, P=0.72; OR 0.94 in Taiwan (n=7920), 95% CI 0.79–1.13, P=0.51). Our previous analysis of the combined patients with and without warfarin treatment in the J-RHYTHM Registry (n=7,406) also showed no sex difference after adjustment for warfarin use and other covariates. Another small Japanese cohort study further demonstrated that male sex is a higher risk for thromboembolism rather than female. All these cohort studies suggest that there may be a racial difference in the incidence of thromboembolism between Asian and Caucasian NVAF patients. Namely, female sex is a risk in patients aged ≥75 years in the Caucasian population, whereas there is no risk at any age in the female Asian population. Although possible mechanisms for higher risk of female sex, including hormone therapy and menopause, are discussed, there are no studies available with a racial difference in the incidence of thromboembolism. The latest paper by the same research group as for the cohort study in Hong Kong showed female sex as a risk in high-risk patients only (CHA2DS2-VASc score ≥2) by multivariate analysis after adjustment for antithrombotic therapy and other covariates (HR 1.16 (n=8,754), 95% CI 1.05–1.29, P=0.003), but more clinical evidence regarding this important issue is needed.

### Table 3. Comparison of Risk Scores for Predicting Thromboembolism in All NVAF Patients (n=997)

<table>
<thead>
<tr>
<th>Risk score</th>
<th>c-statistic</th>
<th>SE</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHADS2</td>
<td>0.638</td>
<td>0.050</td>
<td>0.534–0.730</td>
<td>0.006</td>
</tr>
<tr>
<td>mCHA2DS2-VASc</td>
<td>0.595</td>
<td>0.045</td>
<td>0.504–0.680</td>
<td>0.047</td>
</tr>
<tr>
<td>mCHA2DS2-VA</td>
<td>0.624</td>
<td>0.046</td>
<td>0.531–0.709</td>
<td>0.013</td>
</tr>
</tbody>
</table>

Each risk score was assessed as a categorical variable (0, 1, 2, and ≥3). (A) C-statistic for predicting thromboembolism in each score. (B) Comparison of risk scores for predicting thromboembolism using the c-statistic and the NRI. CI, confidence interval; NRI, net reclassification improvement; SE, standard error. Other abbreviations as in Tables 1, 2.

### Table 4. Comparison of Risk Scores for Predicting Thromboembolism in NVAF Patients With mCHA2DS2-VASc Scores of 0 and 1 (n=374)

<table>
<thead>
<tr>
<th>Risk score</th>
<th>c-statistic</th>
<th>SE</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>mCHA2DS2-VASc</td>
<td>0.522</td>
<td>0.106</td>
<td>0.322–0.716</td>
<td>0.82</td>
</tr>
<tr>
<td>mCHA2DS2-VA</td>
<td>0.575</td>
<td>0.106</td>
<td>0.367–0.760</td>
<td>0.46</td>
</tr>
</tbody>
</table>

(A) C-statistic for predicting thromboembolism in each score. (B) Comparison of risk scores for predicting thromboembolism using the c-statistic and the NRI. Abbreviations as in Tables 1–3.
Validation of CHA2DS2-VA Score in Japanese NVAF Patients

We previously demonstrated that the mCHA2DS2-VASc score is useful in risk stratification for thromboembolism in Japanese NVAF patients with and without warfarin treatment.26 However, in the present analysis, more appropriate stepwise thromboembolic event rate per incremental score and higher OR were found in patients stratified by the mCHA2DS2-VA score (Figure 4B) compared with those stratified by mCHA2DS2-VASc score (Figure 4A). Furthermore, detailed analyses showed that there was a significant difference in the c-statistic and a significant NRI between the mCHA2DS2-VASc and mCHA2DS2-VA scores in all study patients. Although we previously validated the use of the mCHA2DS2-VASc score in Japanese NVAF patients,28 the present analyses further validate that the mCHA2DS2-VA score may be more useful in risk stratification for thromboembolism in Japanese NVAF patients. Notably, the c-statistic in the CHADS2 score showed the highest value among the 3 risk scoring systems in all patients (Table 3A). This finding suggests the usefulness of the CHADS2 score for identifying patients at risk of thromboembolism, which further supports the current Japanese guideline using a CHADS2 score-based risk stratification system.23

The CHA2DS2-VASc score was originally recognized as a risk scoring system to identify truly low-risk patients for thromboembolism. Indeed, the c-statistic values of both the mCHA2DS2-VASc and mCHA2DS2-VA score showed a trend to be higher than that of the CHADS2 score in patients with CHADS2 scores 0 and 1 (Table S1). However, the thromboembolism event rate in patients with CHADS2 score 0 and in those with mCHA2DS2-VASc score 0 was the same (0.70%/year and 0.71%/year) in the present study, although the patient population classified into mCHA2DS2-VASc scores 0 and 1 was smaller than that into CHADS2 scores 0 and 1 (37.3% vs. 66.0%). This indicates that the CHA2DS2-VASc score may not be a risk scoring system for identifying truly low-risk patients. Our scoring system excluding female sex as a risk factor from the mCHA2DS2-VASc score (ie, mCHA2DS2-VA score) showed that thromboembolic events occurred in 2/180 patients (0.56%/year) with mCHA2DS2-VA score 0 (Figure 4B), which was 21% lower than that in patients with mCHA2DS2-VASc score 0. We also found that there was a highly significant c-statistic difference and a highly significant NRI between the mCHA2DS2-VASc and mCHA2DS2-VA scores in patients with mCHA2DS2-VASc scores 0 and 1. Furthermore, there were no thromboembolic events in female patients aged <65 years without other risk factors (ie, mCHA2DS2-VASc score 1) in the present study. All these findings partly support the European and American guidelines for the management of AF in female patients with CHA2DS2-VASc score 1, who do not need to have an anticoagulation therapy, and indicate that in the Japanese population the CHA2DS2-VA score may be more useful in identifying truly low-risk patients for thromboembolism rather than the CHA2DS2-VASc score.

Study Limitations

First, the number of enrolled patients without warfarin treatment was relatively small and they were at relatively low risk of thromboembolism, because of lower mean CHADS2 score and younger age, although the patients were prospectively followed up for 2 years. The small number of lost patients (n=5, 0.5%) during follow-up may minimize the effect on the overall results of the study. Also, more detailed analyses using the pooled data of 3 Japanese AF cohorts regarding a low incidence of thromboembolic events have been recently reported.35 Second, clinical characteristics comprising the original CHA2DS2-VASc score could not be obtained from the database at enrollment. Therefore, we used a modified CHA2DS2-VASc score instead of the original score. Third, only information regarding warfarin treatment at baseline was used in the analyses, and therefore the effects of warfarin initiation observed in 23% of the study patients were not considered. Although there was no sex difference in the warfarin-initiated patients, the incidence of thromboembolic events might be underestimated. Finally, the diagnosis of the endpoints was determined by participating physicians, and not validated by an independent committee.

Conclusions

In Japanese NVAF patients, female sex is not a risk factor for thromboembolism. A modified CHA2DS2-VA score, a risk scoring system excluding female sex from a modified CHA2DS2-VASc score, may be more useful in risk stratification for thromboembolic events than the modified CHA2DS2-VASc score, especially in identifying truly low-risk patients.

Acknowledgments

This study was planned by the Japanese Society of Electrocardiology and supported by a grant from the Japan Heart Foundation.

Disclosures

K.O. reports receiving research fund from Boehringer Ingelheim and Daiichi-Sankyo, and remuneration from Boehringer Ingelheim, Bayer Healthcare, Daiichi-Sankyo, and Pfizer; H.I., receiving research fund from Boehringer Ingelheim and Daiichi-Sankyo, and remuneration from Daiichi-Sankyo, Bayer Healthcare and Boehringer Ingelheim; H.A., receiving research fund from Daiichi-Sankyo and Boehringer Ingelheim, and lecture fees from Bayer Healthcare and Boehringer Ingelheim; T.Y., receiving research fund from Boehringer Ingelheim and Daiichi-Sankyo, and remuneration from Boehringer Ingelheim, Daiichi-Sankyo, Bayer Healthcare, Pfizer, Bristol-Myers Squibb, and Eisai; H.O., receiving lecture fee from Boehringer Ingelheim, and consultancy fees from Daiichi-Sankyo and Bayer Healthcare; H.T. and E.T. have no disclosures.

References


Circulation Journal Vol.79, August 2015
Supplementary Files

Supplementary File 1

Table S1. Comparison of risk scores for predicting thromboembolism in NVAF patients with CHADS2 scores of 0 and 1 (n=653)

Please find supplementary file(s):