

Our study confirms that selected patients with PE can be treated as outpatients with favorable short-term outcomes.

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LESS IS MORE

Oral Anticoagulant Prescription in Patients With Atrial Fibrillation and a Low Risk of Thromboembolism: Insights From the NCDR PINNACLE Registry

In patients with atrial fibrillation (AF) who are at risk for thromboembolism, anticoagulation therapy with warfarin or the newer novel anticoagulants reduces morbidity and mortality.^{1,2}

Because oral anticoagulant use carries a risk of bleeding, the drugs are not recommended in patients with AF who are at a particularly low risk for stroke. Specifically, previous AF guidelines recommend against the use of oral anticoagulation in patients younger than 60 years without heart disease or other known risk factors for thromboembolism,³ and more recently updated guidelines do not recommend the use of oral anticoagulation in patients with AF without any established risk factor for stroke.⁴ We sought to examine the prevalence of oral anticoagulant prescription that does not adhere to the guidelines in young and healthy patients with AF who were at the lowest risk for thromboembolism, as well as the clinical predictors of this practice.

Methods | Of 1 711 326 patients enrolled in the National Cardiovascular Data Registry's PINNACLE (Practice Innovation and Clinical Excellence) Registry between January 1, 2008, and December 30, 2012, a total of 359 315 (21.0%) had received a diagnosis of AF. Our final study cohort, derived from 76 cardiology practices from 287 different geographic office sites in 33 states, comprised 10 995 young (<60 years) and healthy patients with AF and no structural heart disease who were at low risk for thromboembolism. While all these patients by definition had a CHADS₂ (defined as 1 point each for congestive heart failure, hypertension, age ≥75 years, and diabetes mellitus, and 2 points for prior stroke, transient ischemic attack, or thromboembolism) score⁵ of 0, we also performed a secondary analysis restricted to those with a CHA₂DS₂-VASc (defined as 1 point each for congestive heart failure, hypertension, age 65-74 years, diabetes mellitus, vascular disease, and female sex, and 2 points each for prior stroke, transient ischemic attack, or thromboembolism and age ≥75 years) score⁶ of 0. To investigate the independent associations of various characteristics with the outcome of oral anticoagulant prescription, we constructed hierarchical modified Poisson regression models adjusted for patient demographics and clinical characteristics. Certification to use these deidentified data was obtained from the University of California, San Francisco, Committee on Human Research.

Results | In the cohort of patients with a CHADS₂ score of 0 and the cohort of those with a CHA₂DS₂-VASc score of 0, a total of 2561 (23.3%) and 1787 (26.6%) patients with AF, respectively, were prescribed an oral anticoagulant. Demographics and clinical characteristics of patients in each cohort stratified by prescription of oral anticoagulants are shown in the **Table**. In both the cohort of patients with a CHADS₂ score of 0 and the cohort of those with a CHA₂DS₂-VASc score of 0, patients with AF who were prescribed oral anticoagulants were older and more frequently insured by Medicare or were uninsured. Patients in both cohorts who were prescribed oral anticoagulation had a higher body mass index, and a greater proportion of patients received anticoagulation than not in the Northeast and West. Patients prescribed oral anticoagulants were less likely to have paroxysmal AF or to be current smokers. In only the cohort of patients with a CHADS₂ score of 0, patients who were prescribed oral anticoagulants were more likely to be male and have dyslipidemia. In multivari-

Table. Baseline Characteristics of Patients With Atrial Fibrillation at Low Stroke Risk With No Structural Heart Disease

Characteristic	Cohort		P Value	CHA ₂ DS ₂ -VASC Score = 0 (n = 6730) ^a		P Value
	CHADS ₂ Score = 0 (n = 10 995) ^a			CHA ₂ DS ₂ -VASC Score = 0 (n = 6730) ^a		
	Prescribed Oral Anticoagulant (n = 2561)	No Oral Anticoagulant (n = 8434)		Prescribed Oral Anticoagulant (n = 1787)	No Oral Anticoagulant (n = 4943)	
Age, mean (SD), y	50.9 (7.6)	46.3 (10.4)	<.001	50.7 (7.7)	46.6 (10.1)	<.001
Male sex	1811 (70.8) ^b	5020 (59.6) ^b	<.001	0	0	
Race						
White	1100/1190 (92.4)	3614/3904 (92.6)	.11	770/825 (93.3)	2162/2301 (94.0)	.56
Black	61/1190 (5.1)	228/3904 (5.8)		37/825 (4.5)	102/2301 (4.4)	
Other	29/1190 (2.4)	62/3904 (1.6)		18/825 (2.2)	37/2301 (1.6)	
Hispanic ethnicity ^b	25 (2.3)	78 (2.4)	.87	13 (1.8)	40 (2.1)	.60
Insurance						
Private	1845/2270 (81.3)	5896/7159 (82.4)	.002	1314/1581 (83.1)	3631/4282 (84.8)	.002
Medicare	160/2270 (7.0)	373/7159 (5.2)		101/1581 (6.4)	180/4282 (4.2)	
Medicaid	54/2270 (2.4)	237/7159 (3.3)		24/1581 (1.5)	91/4282 (2.1)	
Other	60/2270 (2.6)	220/7159 (3.1)		42/1581 (2.7)	144/4282 (3.4)	
Uninsured	151/2270 (6.7)	433/7159 (6.0)		100/1581 (6.3)	236/4282 (5.5)	
Region						
Northeast	361/2561 (14.1)	874/8434 (10.4)	<.001	266/1787 (14.9)	540/4943 (10.9)	<.001
Midwest	662/2561 (25.8)	2127/8434 (25.2)		452/1787 (25.3)	1354/4943 (27.4)	
South	906/2561 (35.4)	3823/8434 (45.3)		615/1787 (34.4)	2064/4943 (41.8)	
West	632/2561 (24.7)	1610/8434 (19.1)		454/1787 (25.4)	985/4943 (19.9)	
Body mass index, mean (SD) ^c	31.6 (7.3)	29.0 (6.3)	<.001	31.5 (6.7)	29.3 (5.7)	<.001
Atrial fibrillation classification						
First episode detected	413/891 (46.4)	1156/2901 (39.8)	.003	272/594 (45.8)	758/1770 (42.8)	.002
Paroxysmal	385/891 (43.2)	1405/2901 (48.4)		254/594 (42.8)	863/1770 (48.8)	
Persistent	93/891 (10.4)	340/2901 (11.7)		68/594 (11.4)	149/1770 (8.4)	
Comorbidities						
Peripheral arterial disease	12 (0.5)	43 (0.5)	.80	0	0	
Dyslipidemia	503 (19.6)	1505 (17.8)	.04	349 (19.5)	918 (18.6)	.38
Tobacco use						
Never	802/1522 (52.7)	2938/5546 (53.0)	<.001	521/1051 (49.6)	1723/3290 (52.5)	<.001
Current	273/1522 (17.9)	1250/5546 (22.5)		206/1051 (19.6)	761/3290 (23.2)	
Quit <12 mo ago	75/1522 (4.9)	195/5546 (3.5)		50/1051 (4.8)	113/3290 (3.4)	
Quit >12 mo ago	372/1522 (24.4)	1163/5546 (21.0)		274/1051 (26.1)	693/3290 (20.8)	

Abbreviations: CHADS₂, 1 point each for congestive heart failure, hypertension, age 75 years or older, and diabetes mellitus, and 2 points for prior stroke, transient ischemic attack, or thromboembolism; CHA₂DS₂-VASC, 1 point each for congestive heart failure, hypertension, age 65 to 74 years, diabetes mellitus, vascular disease, and female sex, and 2 points each for prior stroke, transient ischemic attack, or thromboembolism and age 75 years or older.

^a Data are given as number/total number (percentage) unless otherwise noted.

Where values do not total the number in the cohort, this is owing to missing values. Some percentages within a category do not total 100% due to rounding.

^b Missing data for each category are not shown; percentages are calculated based on the denominator of participants with known values for each variable.

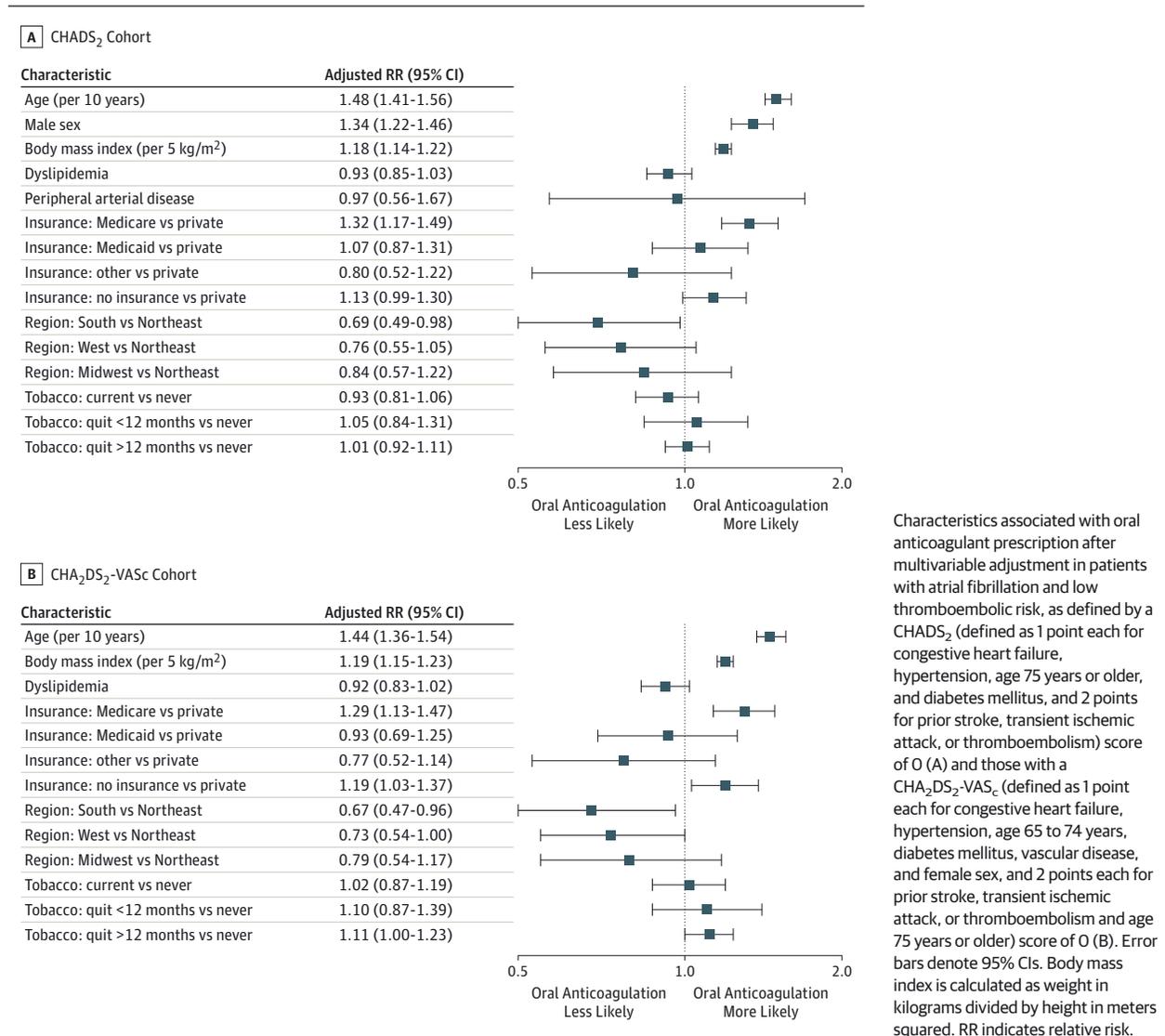
^c Calculated as weight in kilograms divided by height in meters squared.

able analysis of the cohort of patients with a CHADS₂ score of 0 that assessed clinical predictors of oral anticoagulant prescription adjusted for clustering of patients within sites, older age (adjusted relative risk [RR], 1.48 per 10 years; 95% CI, 1.41-1.56, $P < .001$), male sex (adjusted RR, 1.34; 95% CI, 1.22-1.46, $P < .001$), higher body mass index (adjusted RR, 1.18 per 5 kg/m²; 95% CI, 1.14-1.22, $P < .001$), and Medicare compared with private insurance (adjusted RR, 1.32; 95% CI, 1.17-1.49, $P < .001$) were associated with a higher likelihood of being prescribed oral anticoagulants, whereas treatment in the South compared with the Northeast of the United States was

associated with a lower likelihood of being prescribed oral anticoagulants (adjusted RR, 0.69; 95% CI, 0.49-0.98, $P = .04$) (Figure, A).

In multivariable analysis of the cohort of patients with a CHA₂DS₂-VASC score of 0, older age (adjusted RR, 1.44 per 10 years; 95% CI, 1.36-1.54, $P < .001$), higher body mass index (adjusted RR, 1.19 per 5 kg/m²; 95% CI, 1.15-1.23, $P < .001$), Medicare compared with private insurance (adjusted RR, 1.29; 95% CI, 1.13-1.47, $P < .001$), and no insurance compared with private insurance (adjusted RR, 1.19; 95% CI, 1.03-1.37, $P = .02$) were associated with a higher likelihood of being pre-

Figure. Relative Risk of Oral Anticoagulant Prescription in Patients With Atrial Fibrillation Who Have Low Stroke Risk



scribed oral anticoagulants, whereas treatment in the South compared with the Northeast of the United States was associated with a lower likelihood of being prescribed oral anticoagulants (adjusted RR, 0.67; 95% CI, 0.47-0.96, *P* = .03) (Figure, B).

Discussion | In a large, nationally representative sample of young (<60 years) and healthy outpatients with AF who were at the lowest risk of stroke treated by cardiovascular specialists, approximately 25% of patients were prescribed oral anticoagulant therapy, contrary to contemporary guideline recommendations. Specific patient characteristics predicted an increased likelihood of oral anticoagulant prescription. These findings may have important public health implications since young and healthy patients with AF who are at the lowest risk of stroke have an unfavorable risk-benefit profile when prescribed oral anticoagulants.

Our study has limitations. First, the PINNACLE Registry did not capture data on certain diagnoses, such as previous pulmonary embolism or deep vein thrombosis, which may have warranted use of oral anticoagulation independent of AF. Second, the PINNACLE Registry did not include procedural data regarding electrical cardioversion or catheter ablation for AF. Since oral anticoagulation is often administered for 1 to 2 months after these procedures, patients who recently underwent these procedures may have been categorized as taking oral anticoagulants despite the actual intention for the treatment to be only transient.

Because oral anticoagulants have the potential for substantial benefit and harm, decision making for health care professionals regarding stroke prophylaxis in patients with AF presents a unique clinical challenge. Prescription of oral anticoagulants by cardiovascular specialists in a significant proportion of patients at the lowest thrombotic risk suggests

that these health care professionals may not be fully aware of the potential risks associated with oral anticoagulation or the particularly low risk of stroke in this population.

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LESS IS MORE

Unnecessary Hospitalization and Related Harm for Patients With Low-Risk Syncope

Testing in patients admitted for syncope rarely identifies an underlying cause.^{1,2} The San Francisco Syncope Rule (SFSR) was developed to identify patients with syncope at low risk for short-term serious outcomes who were unlikely to benefit from hospital admission.³ During hospitalization, many patients experience adverse events.⁴ Admission and testing can also lead to incidental findings of unclear clinical significance (“incidentalomas”) that can trigger clinical cascades of further testing.⁵ We performed a retrospective cohort study examining outcomes of patients who presented with low-risk syncope and were unnecessarily admitted to the hospital.

Methods | From January 1, 2010, to December 31, 2012, all patients with an *International Classification of Disease, Ninth Revision (ICD-9)* diagnosis of syncope (codes 780.2, 780.0, 458.0, or 780.4) were reviewed by internal medicine physicians (J.V.C., E.A., H.H., and C.K.). Hospitalizations were excluded if there was an obvious alternative reason for admission on presentation; the admission involved drug intoxication, alcohol intoxication, or trauma; patients were directly admitted or transferred; or determinants of SFSR were not available.

We focused on patients with SFSR ratings of 0 (systolic blood pressure >90 mm Hg on triage, hematocrit >30% [to convert to proportion of 1.0, multiply by 0.01], no history of congestive heart failure, no shortness of breath, and no nonsinus rhythm or new electrocardiographic changes) because they are at low risk for bad outcomes and likely did not require admission.^{5,6} Data abstraction included length of stay, laboratory testing, imaging testing, procedures, and consultations (Table 1). Adverse events were determined using the Institute for Healthcare Improvement tool.⁴ Reviewers also noted unexpected incidental findings during patient evaluation.

Descriptive statistics were computed using Microsoft Excel (Microsoft Corp). This study was approved by the institutional review board of the University of Maryland, Baltimore. The need for informed consent was waived by the institutional review board. Data were not deidentified because it would not have been possible to access medical records without the information.

Results | A total of 507 admissions were identified by ICD-9 codes, of which 213 met inclusion criteria. Of 213 admissions