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Oral Anticoagulant Use in Atrial Fibrillation Patients with a Low Risk of Thromboembolism: Insights from the NCDR® PINNACLE Registry

Jonathan C. Hsu, MD, MAS[*], **Paul S. Chan, MD, MSc**[†], **Fengming Tang, MS**[†], **Thomas M. Maddox, MD, MSc**[‡], and **Gregory M. Marcus, MD, MAS**[§]

[*]From the Cardiac Electrophysiology Section, Division of Cardiology, Department of Medicine, University of California, San Diego, San Diego, California

[†]Mid America Heart Institute and the University of Missouri, Kansas City, Missouri

[‡]VA Eastern Colorado Health Care System/University of Colorado School of Medicine, Denver, Colorado

[§]Section of Cardiac Electrophysiology, Division of Cardiology, Department of Medicine, University of California, San Francisco, San Francisco, California

Abstract

Objectives—We sought to investigate the prevalence and predictors of oral anticoagulation prescription among patients with atrial fibrillation (AF) at the lowest risk for thromboembolism, despite contemporary consensus guidelines that do not recommend anticoagulation therapy in this population.

Background—In young and healthy AF patients without significant thromboembolic risk factors, anticoagulant treatment carries bleeding risks that outweigh stroke prevention benefit.

Methods—Within a large contemporary registry of cardiology outpatients, we identified low-risk patients with AF meeting criteria for a contemporary consensus guideline class III indication against use of anticoagulation (age < 60 years, $CHADS_2$ Score=0, and no structural heart disease) between 2008–2012, and a second cohort with the same criteria and a CHA_2DS_2-VASc Score of 0. Using hierarchical modified Poisson regression models adjusted for patient characteristics, we examined predictors of oral anticoagulation treatment in these low thromboembolic risk AF patients.

Results—Oral anticoagulation was prescribed in a total of 2,561 of 10,995 (23.2%) AF patients with a $CHADS_2$ score of 0 and 1,787 of 6,730 (26.6%) AF patients with a CHA_2DS_2-VASc score

Address for Correspondence: Gregory M Marcus, MD, MAS, 505 Parnassus Ave, M1180B, San Francisco, CA, 94143-0124, Phone: 415-476-3450, Fax: 415-476-6260, marcusg@medicine.ucsf.edu.

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of 0. In multivariable analysis, older age (RR 1.48 per 10 years; 95% CI, 1.41–1.56; p<0.0001), male sex (RR 1.34; 95% CI, 1.22–1.46; p<0.0001), higher body mass index (RR 1.18 per 5 kg/m^2; 95% CI, 1.14–1.22; p<0.0001), and Medicare insurance (reference: private insurance; RR,1.32; 95% CI, 1.17–1.49; overall p<0.0001) were associated with a higher likelihood of oral anticoagulant prescription, whereas treatment in Southern states (reference: Northeast; RR 0.69; 95% CI, 0.49–0.98;overall p=0.1187) was associated with a lower likelihood of oral anticoagulant prescription.

Conclusions—In a large, real-world population of AF patients with the lowest thrombotic risk, approximately 1 in 4 were treated with oral anticoagulation against contemporary guideline recommendations.

Keywords

Atrial fibrillation; Anticoagulants; Stroke; Thromboembolism

Atrial fibrillation (AF) is the most common cardiac arrhythmia, with an estimated 1 in 4 lifetime risk in those older than 40 years of age and a projected increase in prevalence to approximately 5.6 million affected individuals in the United States by the year 2050 (1,2). In patients with AF at higher risk for thromboembolism, anticoagulation with warfarin (a vitamin K antagonist) or the newer novel anticoagulants reduces morbidity and mortality (3–6). Because oral anticoagulant use carries a risk of bleeding, including potentially fatal intracranial hemorrhage, anticoagulant treatment is not recommended in AF patients at a particularly low risk for stroke. Specifically, previous AF guidelines recommend against the use of oral anticoagulation in patients under 60 years of age without heart disease or other known risk factors for thromboembolism (7), and more recently updated guidelines do not recommend oral anticoagulation in AF patients without any established risk factor for stroke (8). Although it is well known that appropriate oral anticoagulant prescription in AF patients at risk for stroke outside clinical trial settings falls short of guideline-based expectations (9–12), it is unknown whether young and healthy AF patients with the lowest stroke risk are being treated with oral anticoagulation that may increase bleeding risk without a commensurate reduction in stroke risk. To our knowledge, a real-world evaluation of guideline adhering practice patterns of anticoagulation prescription in AF patients with the lowest stroke risk has never been performed.

We evaluated the prevalence of oral anticoagulant prescription by cardiovascular specialists in a cohort of outpatients using data from the National Cardiovascular Data Registry (NCDR)’s Practice Innovation and Clinical Excellence (PINNACLE) Registry®. Use of this prospective national registry of cardiovascular care in the United States provides a unique opportunity to examine patterns of oral anticoagulant treatment in routine practice among outpatients as well as clinical predictors of this practice.

Methods

Data Source

The NCDR PINNACLE registry was created in 2008 by the American College of Cardiology as the first national, prospective, office-based cardiac quality improvement

registry in the United States (13,14). Participating academic and private practices collect longitudinal, point-of-care data that includes patient demographics, symptoms, comorbidities, vital signs, medications, laboratory values, and recent hospitalizations with either paper forms, or modification of a practice's electronic medical record using a standardized collection tool to comprehensively obtain and transmit uniform data. Quality checks and analyses of the data are performed at St. Luke's Mid America Heart Institute (Kansas City, Missouri), the primary analytical center for the PINNACLE registry.

Study Population

Of 1,711,326 patients enrolled into the PINNACLE registry between January 1, 2008 and December 30, 2012, 359,315 (21.0%) had a diagnosis of AF. We based our inclusion criteria on the American College of Cardiology/American Heart Association/European Society of Cardiology guidelines in place during the study timeframe, which defined as a class III indication (i.e., recommended against) the use of oral anticoagulation for the primary prevention of stroke in patients below the age of 60 years without structural heart disease or any risk factors for thromboembolism (7). In order to identify these young and healthy patients, our primary cohort (referred to as the "$CHADS_2$ score = 0 cohort") was restricted to patients <60 years old [n=296,014 patients excluded], patients with non-valvular AF [n=824 patients excluded], and patients without structural heart disease (by excluding patients with coronary artery disease, prior myocardial infarction, or left ventricular ejection fraction< 50%); patients with a $CHADS_2$ Score >0 were excluded by omitting patients with congestive heart failure, hypertension, age ≥75 years, diabetes, or previous stroke/transient ischemic attack (15) [n=51,176 patients excluded]. We also excluded patients from cardiology practices with ≥10 eligible patients [n=88 patients excluded] and patients without known contraindications to oral anticoagulation [n=218 patients excluded]. Therefore, our final study cohort was comprised of 10,995 young and healthy patients with AF and no structural heart disease at low risk for thromboembolism from __ practices (Figure 1). We also conducted a secondary analysis, using the CHA2DS1-VASc score, since it has been shown to be a more sensitive tool to risk-stratify AF patients who may be at risk for stroke and benefit from anticoagulant therapy (16), use of this risk score may have influenced cardiovascular specialist prescription of oral anticoagulation during the study timeframe, as reflected in subsequently published updated guidelines after the study (8). These updated guidelines advise the use of CHA_2DS_2-VASc Score for the assessment of stroke risk and state that it is reasonable to omit antithrombotic therapy for patients with nonvalvular AF and a CHA_2DS_2-VASc Score =0 (8). As a result, we also compared anticoagulant treatment patterns in a mirrored analysis of a more strictly defined cohort (deemed the "CHA_2DS_2-VASc Score =0 Cohort") of the AF study population. In addition to carrying over all of the same exclusion criteria above, this cohort was restricted to those young and healthy patients with a CHA_2DS_2-VASc Score =0, with 1 point for congestive heart failure, hypertension, age ≥65 years [2 points if age ≥75 years], diabetes, female sex, and coronary or peripheral arterial disease, and 2 points for stroke/transient ischemic attack. Selection of this CHA_2DS_2-VASc Score =0 Cohort led to exclusion of an additional 4,265 patients, for a total cohort of 6,730 patients. To minimize over-representation by patients with multiple visits, only data from the index visit of each patient during the study period were used.

Study Outcomes

Our main study outcome was treatment with any U.S. Food and Drug Administration (FDA)-approved oral anticoagulant for stroke prevention in patients with AF, which would include warfarin, dabigatran or rivaroxaban (apixaban had not yet been approved by the U.S. FDA during the study timeframe). Among patients not treated with anticoagulant therapy, we also examined whether these patients were treated with an antiplatelet agent or were not receiving either oral anticoagulant or antiplatelet therapy. Treatment with an antiplatelet agent was defined as prescription of aspirin, clopidogrel, ticlopidine, prasugrel and/or dipyridamole.

Statistical Analysis

Normally distributed continuous variables are expressed as means and standard deviations, whereas categorical variables are expressed as proportions. Unadjusted differences were compared using the χ^2 test for categorical variables and t-tests for continuous variables.

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 demographic and clinical characteristics. These models included site as a random effect to account for patient clustering within sites. Covariates considered to be potential predictors were entered as fixed effects in the multivariable model and included age, sex, U.S. geographical region, health insurance, body mass index (BMI), AF classification, peripheral arterial disease, dyslipidemia, and tobacco use. Covariates selected for the multivariate analyses were chosen based on the plausibility that they could be associated with differential prescription of anticoagulation. Because sex is inherent to the CHA_2DS_2-VASc Score, it was not included as a predictor in related models.

Race was not included in the multivariable model due to a high rate of missing data (42.3%). The highest missing rate for other variables included BMI (32.0%), tobacco use (35.7%), and insurance payer (14.2%), therefore, a missing indicator was included in models that contained these variables. Additionally, missing data were assumed to be missing at random and were imputed with 10 imputation data sets (17), in which all patient variables were used to inform the imputation model (18).

Since the rate of oral anticoagulant prescription exceeded 10%, we used modified Poisson regression models at all steps to estimate relative risks (RRs) with 95% confidence intervals (CI) directly (instead of odds ratios obtained from logistic regression, which may overestimate effect differences) (19,20). Statistical tests were 2-sided and considered significant if they yielded a p value <0.05. Analyses were performed using the SAS statistical package version 9.3 (SAS Institute, Cary, NC), R version 2.15.3 (Foundation for Statistical Computing, Vienna, Austria), and IVEWare (Institute for Social Research, University of Michigan, Ann Arbor).

Results

A total of 10,995 patients without structural heart disease and a $CHADS_2$ score of 0 ($CHADS_2$ cohort), and 6,730 with a CHA_2DS_2-VASc Score of 0 (CHA_2DS_2-VASc cohort)

were identified. In $CHADS_2$ cohort, a total of 2,561 (23.2%) AF patients were prescribed an oral anticoagulant. Warfarin was the most commonly used therapy (n=____ [__%]), followed by dabigatran (n=_____ [___%]) and rivaroxaban (n=___ [___%]). In the CHA_2DS_2-VASc cohort, a total of 1,787 (26.6%) AF patients were prescribed an oral anticoagulant. Similarly, warfarin was the most commonly used therapy (n=____ [__%]), followed by dabigatran (n=_____ [___%]) and rivaroxaban (n=___ [___%]).

Demographic and clinical characteristics among patients in each cohort stratified by prescription of oral anticoagulation are shown in Table 1. In both the $CHADS_2$ Score =0 Cohort and CHA_2DS_2-VASc Score =0 Cohort, AF patients without structural heart disease who were prescribed oral anticoagulation were older and more frequently insured by Medicare or were uninsured. Compared with those AF patients who were not prescribed oral anticoagulation, patients in both cohorts who were prescribed oral anticoagulation had a higher BMI and were more likely to reside in the Northeast and West. Patients prescribed oral anticoagulation were less likely to have paroxysmal AF or to be current smokers. In the $CHADS_2$ Score =0 Cohort only, patients who were prescribed oral anticoagulation were more likely to be male and have dyslipidemia.

In the $CHADS_2$ Score =0 Cohort, of all 2,561 patients who were prescribed an oral anticoagulant, 31.2% of patients (n=799) were also taking an antiplatelet agent. The same was true in the CHA_2DS_2-VASc Score =0 Cohort of 1,787 patients who were prescribed an oral anticoagulant, with 30.0% of patients (n=589) also taking an antiplatelet agent. In both the $CHADS_2$ Score =0 Cohort and the CHA_2DS_2-VASc Score =0 Cohort, more than one-third of patients were prescribed antiplatelet therapy only (34.8% and 38.1%, respectively) or no antithrombotic agent at all (41.9% and 35.3%, respectively) (Table 2).

In multivariable analysis of the $CHADS_2$ Score =0 Cohort assessing clinical predictors of oral anticoagulant prescription adjusted for clustering of patients within sites, older age (adjusted RR, 1.48 per 10 years; 95% CI, 1.41–1.56; $p<0.0001$), male sex (adjusted RR, 1.34; 95% CI, 1.22–1.46; $p<0.0001$), higher BMI (adjusted RR, 1.18 per 5 kg/m^2; 95% CI, 1.14–1.22; $p<0.0001$), and Medicare compared to private insurance (adjusted RR, 1.32; 95% CI, 1.17–1.49; overall $p<0.0001$) were associated with a higher likelihood of being prescribed oral anticoagulation, whereas treatment in the South compared to the Northeast of the United States was associated with a lower likelihood of being prescribed oral anticoagulation (adjusted RR, 0.69; 95% CI, 0.49–0.98; overall p=0.1187) (Figure 2a). In multivariable analysis of the CHA_2DS_2-VASc Score =0 Cohort, older age (adjusted RR, 1.44 per 10 years; 95% CI, 1.36–1.54; $p<0.0001$), higher BMI (adjusted RR, 1.19 per 5 kg/m^2; 95% CI, 1.15–1.23; $p<0.0001$), Medicare compared to private insurance (adjusted RR, 1.29; 95% CI, 1.13–1.47; overall $p<0.0001$), and no insurance compared to private insurance (adjusted RR, 1.19; 95% CI, 1.03–1.37; overall $p<0.0001$) were associated with a higher likelihood of being prescribed oral anticoagulation, whereas treatment in the South compared to the Northeast of the United States was associated with a lower likelihood of being prescribed oral anticoagulation (adjusted RR, 0.67; 95% CI, 0.47–0.96; overall p=0.0745) (Figure 2a).

Discussion

In a large, nationally representative sample of young (<60 years of age) and healthy outpatients with AF at the lowest risk of stroke (both $CHADS_2$ Score =0 and CHA_2DS_2-VASc Score =0) 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 AF patients at the lowest risk of stroke are felt to have an unfavorable risk/benefit profile when prescribed oral anticoagulation.

Despite a well-established association of AF with stroke, significant failure of guideline-adherence in the prescription of oral anticoagulation to reduce thromboembolism in at-risk candidates has been demonstrated in several large-scale studies (10,21,22). While improved educational campaigns and awareness of this important issue may help to reduce the risk of cardioembolic stroke and systemic thromboembolism, the “spill over” effects that might lead to inappropriate prescription in those who need oral anticoagulation the least has not previously been examined. Because oral anticoagulants bring the potential for both substantial benefit and harm, practitioner decision-making in regards to stroke prophylaxis in AF patients presents a unique clinical challenge. Clinical risk scores have been developed to elucidate and quantify stroke risk in AF patients to aid in the decision to prescribe antithrombotic therapies (15,16), realizing that the ultimate decision for oral anticoagulation involves a shared-decision making process supported by formal guidelines (7,8). Prescription of oral anticoagulation by cardiovascular specialists in a significant proportion of patients at the lowest thrombotic risk suggests that these providers may not be fully aware of the potential risks associated with oral anticoagulation or the particularly low risk of stroke in this population.

Previous studies evaluating oral anticoagulation (predominantly vitamin K antagonists such as warfarin) in AF patients at risk for thromboembolic stroke have shown that significant adverse events related to drug administration including the combination of intracranial hemorrhage and other major bleeding to occur in at least 1 to 3% of drug recipients per year (3). In more recent clinical trials of novel oral anticoagulants including dabigatran and rivaroxaban, the rate of significant bleeding was incrementally less, but overall similar to warfarin at approximately 2 to 3% per year (5,6). In a population-based study of Olmsted County, Minnesota patients with “lone” AF (defined as patients <60 years with no clinical history of echocardiographic evidence of concomitant overt cardiopulmonary disease) who were similar to the two low risk cohorts in our study, the overall thromboembolic stroke risk was much less than 1% at approximately 0.35% per year, with a 15-year cumulative stroke risk of 1.3% (23). In comparison, the intracranial hemorrhage risk was higher in several contemporary studies during treatment with warfarin, approaching 0.6–0.7% per year (5,6,24). Use of the novel oral anticoagulants, which are generally regarded as safer than warfarin regarding intracranial hemorrhage, still resulted in an absolute intracranial hemorrhage risk approaching 0.3–0.5% per year (5,6). Taken together, these studies suggest that the risk of intracranial hemorrhage itself from administration of oral anticoagulation may outweigh any benefit of thromboembolic stroke reduction in these low thromboembolic

risk patients. In fact, using a recent cohort in an analysis of an administrative dataset, Friberg et al. evaluated 182,678 patients with AF and found that those with a CHA_2DS_2-VASc Score =0 did not derive a net clinical benefit from anticoagulation (25), suggesting that the patients identified in our current study may indeed be placed at unnecessary risk when exposed to full oral anticoagulation.

Because dabigatran and rivaroxaban were approved towards the end of our study timeframe, the majority of patients prescribed oral anticoagulation in our study were taking warfarin. Although three novel anticoagulants are now currently available in clinical practice, warfarin remains the most common drug prescription for anticoagulation in AF (26). Pooled analyses have found an overall lower major bleeding risk with the novel oral anticoagulants compared to warfarin, with significantly reduced risks of intracranial hemorrhage but higher risk of gastrointestinal hemorrhage with two of the three newer agents (27). Notably, the bleeding risk may be lower with apixaban, and the overall risk versus benefit of that drug in low risk AF patients remains unknown. However, there remains a 2.1% per year risk of major bleeding and 0.3% per year risk of intracranial hemorrhage with apixaban (28), and it is not unreasonable to suggest that this may not adequately balance protection against a 0.35% per year risk of stroke in those AF patients at particularly low risk of thromboembolism (23). Indeed, the most recent 2014 AF guidelines clearly state that it is reasonable to omit oral anticoagulation in AF patients without any established risk factor for stroke (8).

We discovered several clinical predictors of oral anticoagulant prescription in our cohort of young and healthy AF patients at the lowest risk of stroke. Interestingly, males with AF at the lowest risk of stroke were more likely to be prescribed oral anticoagulation than females despite previous studies that suggest an increased stroke risk in females (16,29). This is a clear indication that the important enhanced stroke risk in females remains largely unappreciated, even among cardiovascular specialists. Older AF patients (albeit within those less than 60 years of age) were also more likely to be prescribed oral anticoagulant therapy, which may reflect practitioner perception of age as a risk factor that has a more continuous spectrum rather than strict cutoff values. Higher BMI patients without stroke risk factors were also more often prescribed oral anticoagulation, which may suggest that physicians generally perceive overweight patients as less healthy or at higher risk for adverse events from AF. Although higher BMI has not been incorporated into any major clinical risk tool evaluating stroke risk in AF, there has been previously published evidence that suggests a potential link (30). More frequent prescription of oral anticoagulation in Medicare insured patients and differences in likelihood of oral anticoagulation prescription across regions of the United States in these low stroke risk AF patients may reflect social, economic, or cultural effects that should be the focus of future investigations.

Study limitations

Our study has several 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. However, as such misclassification (if present) would have represented a small proportion of patients in our

study, we do not believe it could be responsible for a meaningful contribution to the substantial number receiving anticoagulation. Using all of the data available whenever possible, we did take care to exclude patients from the analysis that would warrant anticoagulation independent of AF, such as patients with mechanical heart valves. Second, the PINNACLE Registry did not capture any procedural data on electrical cardioversion or catheter ablation for AF. Since oral anticoagulation is often administered in the post-procedural time period for 1–2 months, patients who recently underwent these procedures may have been categorized as taking oral anticoagulation despite the actual intention to treat only transiently. Once again, although this miscategorization would potentially inflate the overall number of lowest risk AF patients prescribed oral anticoagulation, we do not believe this would realistically comprise approximately 1 in 4 patients of the study cohort. Third, the PINNACLE program enrolled patients from motivated cardiology practices dedicated to quality improvement. Therefore, antithrombotic therapy prescription patterns in other U.S. practices may differ from those reported in this study, potentially reducing the generalizability of our results. Such bias may in fact lead to an underestimate of inappropriate anticoagulation in these low risk patients. Fourth, some may argue that the PINACCLE data collection form may not reflect actual prescription of the drug much less what patients actual receive or consume—however, that distinction is arguably minimally relevant for the purposes of this study as the data recorded on the form likely more purely mirrors the *intent* or perceived “correct” prescription of medications. Finally, there was limited registry data available regarding the cardiovascular specialists providing care for these AF patients, including the type of cardiologist (e.g. general, interventional, or cardiac electrophysiologist), board certification of treating specialist, or whether treated by cardiologists in a training program. This last limitation does not undermine our primary findings, but rather may limit our ability to identify accurate predictors of anticoagulation prescription in these patients.

Conclusions

In a large, real-world national registry of cardiology outpatients with AF and no structural heart disease who were at the lowest risk of stroke, cardiovascular disease specialists prescribed oral anticoagulation in approximately 1 out of 4 patients against contemporary evidence-based guideline recommendations. These findings draw attention to potential inappropriate prescription of oral anticoagulation in young and healthy patients with AF in whom bleeding risks may outweigh an antithrombotic benefit and highlight opportunities to reduce the risks of severe bleeding complications through better physician education. In short, contrary to previous reports documenting failure of physicians to take a recommended action, this study reveals an area where physicians should potentially *withhold* prescription in select patients in order to “do no harm” to those at particularly low risk.

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Abbreviations List

AF	Atrial fibrillation
CI	Confidence interval
NCDR	National Cardiovascular Data Registry
PINNACLE	Practice Innovation and Clinical Excellence
RR	Risk ratio

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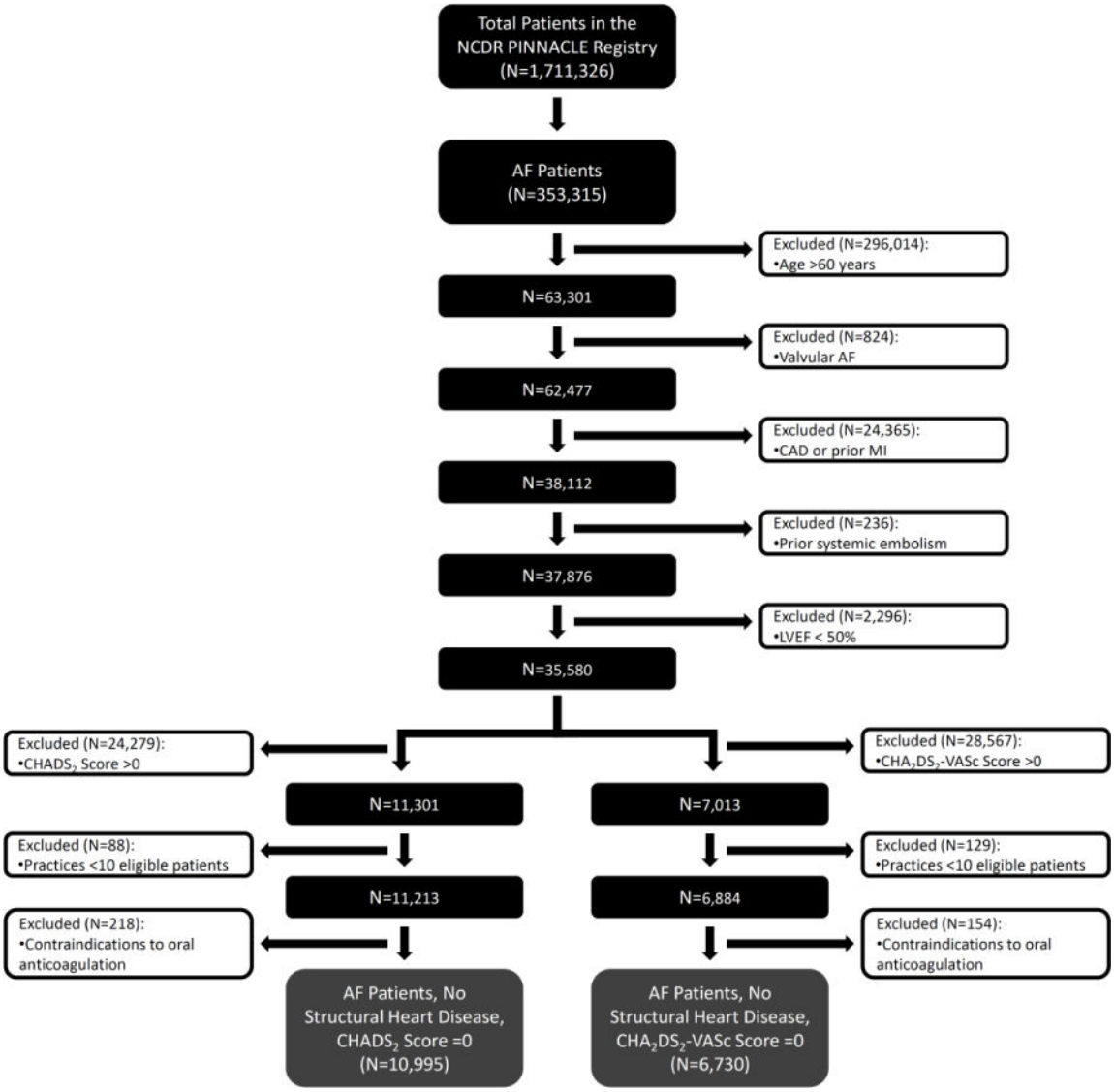

Figure 1. Flowchart of Practice Innovation and Clinical Excellence (PINNACLE) Registry Patients Included in the Analyses

The flowchart depicts the total cohort of patients in the PINNACLE Registry from which exclusion criteria were administered to arrive at the final cohorts.

Abbreviations: AF, atrial fibrillation; CAD, coronary artery disease; LVEF, left ventricular ejection fraction; MI, myocardial infarction

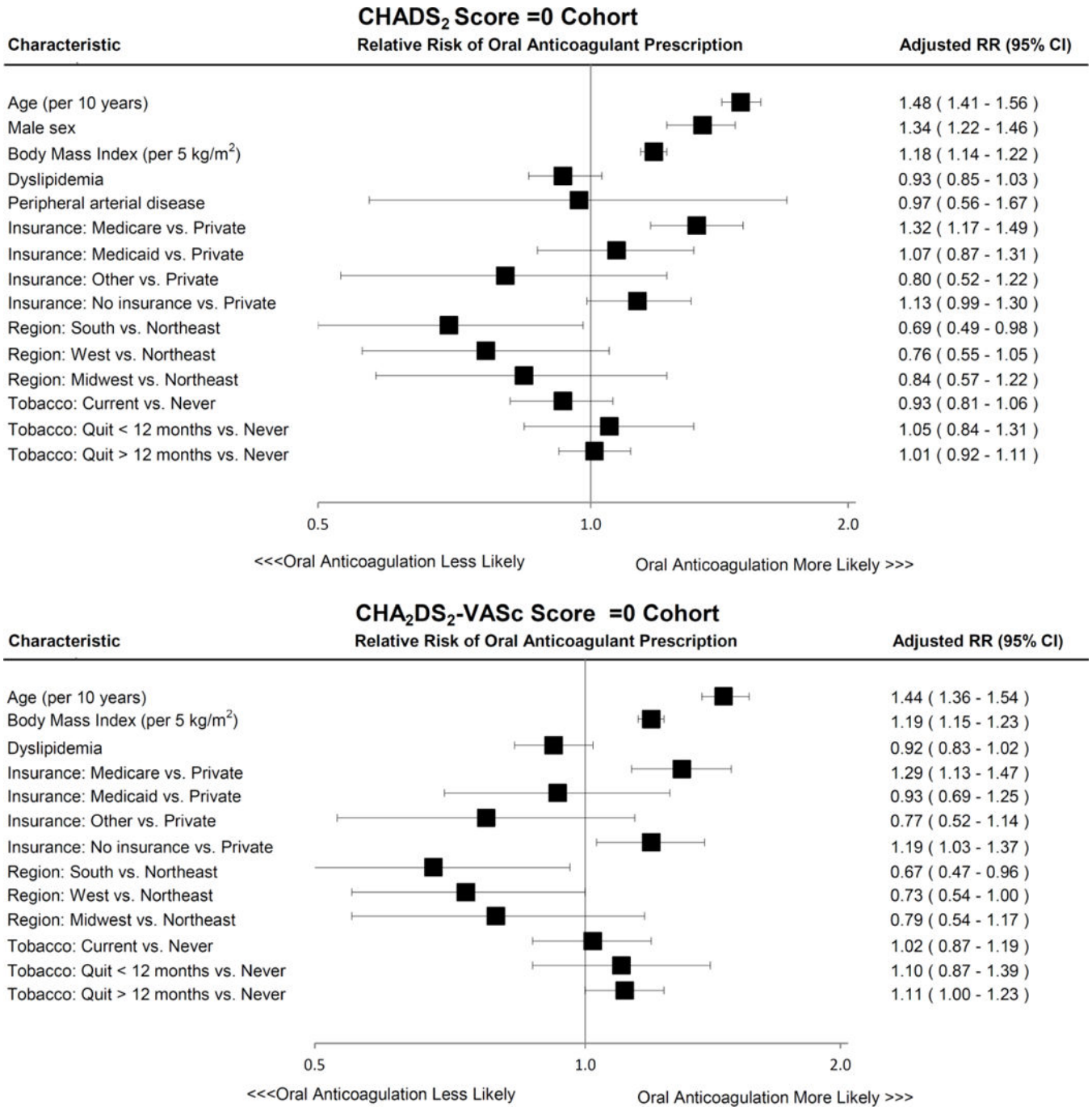

Figure 2. Predictors of Oral Anticoagulant Prescription in Atrial Fibrillation Patients at Low Stroke Risk Among Both $CHADS_2$ Score =0 and CHA_2DS_2-VASc Score =0 Cohorts

Characteristics associated with oral anticoagulant treatment after multivariable adjustment in AF patients with low thromboembolic risk, as defined by $CHADS_2$ Score =0 **(Panel A**, and CHA_2DS_2-VASc Score =0 **(Panel B)**. Error bars denote 95% confidence intervals. Abbreviations: AF, atrial fibrillation; CI, confidence interval; RR, relative risk

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Table 1

Baseline Characteristics of Atrial Fibrillation Patients at Low Stroke Risk with No Structural Heart Disease Categorized by $CHADS_2$ Score =0 and CHA_2DS_2-VASc Score =0, Stratified by Prescription of Oral Anticoagulation

	$CHADS_2$ Score =0 Cohort (N=10,995)			CHA_2DS_2-VASc Score =0 Cohort (N=6,730)		
Characteristic	**Prescribed Oral Anticoagulant (n=2,561)**	**No Oral Anticoagulant (n=8,434)**	***P* Value**	**Prescribed Oral Anticoagulant (N=1,787)**	**No Oral Anticoagulant (N=4,943)**	***P* Value**
Patient demographic characteristics						
Age, years	50.9 ± 7.6	46.3 ± 10.4	<0.001	50.7 ± 7.7	46.6 ± 10.1	<0.001
Male sex	70.8%	59.6%	<0.001	—	—	—
Race			0.105			0.558
White	92.4%	92.6%		93.3%	94.0%	
Black	5.1%	5.8%		4.5%	4.4%	
Other	2.4%	1.6%		2.2%	1.6%	
Hispanic ethnicity	2.3%	2.4%	0.866	1.8%	2.1%	0.597
Insurance			0.002			0.002
Private	81.3%	82.4%		83.1%	84.8%	
Medicare	7.0%	5.2%		6.4%	4.2%	
Medicaid	2.4%	3.3%		1.5%	2.1%	
Other	2.6%	3.1%		2.7%	3.4%	
Uninsured	6.7%	6.0%		6.3%	5.5%	
Region			<0.001			<0.001
Northeast	14.1%	10.4%		14.9%	10.9%	
Midwest	25.8%	25.2%		25.3%	27.4%	
South	35.4%	45.3%		34.4%	41.8%	
West	24.7%	19.1%		25.4%	19.9%	
Body mass index	31.6 ± 7.3	29.0 ± 6.3	<0.001	31.5 ± 6.7	29.3 ± 5.7	<0.001
Atrial fibrillation classification			0.003			0.002
First episode detected	46.4%	39.8%		45.8%	42.8%	
Paroxysmal	43.2%	48.4%		42.8%	48.8%	
Persistent	10.4%	11.7%		11.4%	8.4%	

Characteristic	$CHADS_2$ Score =0 Cohort (N=10,995)			CHA_2DS_2-VASc Score =0 Cohort (N=6,730)		
	Prescribed Oral Anticoagulant (n=2,561)	No Oral Anticoagulant (n=8,434)	*P* Value	Prescribed Oral Anticoagulant (N=1,787)	No Oral Anticoagulant (N=4,943)	*P* Value
Comorbidities						
Peripheral arterial disease	0.5%	0.5%	0.795	—	—	—
Dyslipidemia	19.6%	17.8%	0.039	19.5%	18.6%	0.375
Tobacco use			<0.001			<0.001
Never	52.7%	53.0%		49.6%	52.5%	
Current	17.9%	22.5%		19.6%	23.2%	
Quit within 12 months	4.9%	3.5%		4.8%	3.4%	
Quit more than 12 months ago	24.4%	21.0%		26.1%	20.8%	

Categorical data are reported as percentages. Continuous data are reported as mean ± SD.

Abbreviations: CABG, coronary artery bypass grafting; PCI, percutaneous coronary intervention; TIA, transient ischemic attack.

Table 2

Prevalence of Antithrombotic Prescription in Atrial Fibrillation Patients at Low Stroke Risk with No Structural Heart Disease in Both the $CHADS_2$ Score =0 and CHA_2DS_2-VASc Score =0 Cohorts

Therapy	$CHADS_2$ Score =0 Cohort (N=10,995)	CHA_2DS_2-VASc Score =0 Cohort (N=6,730)
Antithrombotic therapy		
Any oral anticoagulant therapy only	16.0%	17.8 %
Any oral anticoagulant therapy and any antiplatelet therapy	7.3%	8.8%
Any antiplatelet therapy only	34.8%	38.1%
No therapy	41.9%	35.3%

Categorical data are reported as percentages.

Oral anticoagulant therapy was defined as prescription of either warfarin, dabigatran, or rivaroxaban. Antiplatelet therapy was defined as prescription of either individual or combination of aspirin, clopidogrel, ticlopidine, prasugrel, and/or dipyridamole.