HHS Public Access

Author manuscript

Am J Cardiol. Author manuscript; available in PMC 2024 September 15.

Published in final edited form as:

Am J Cardiol. 2023 September 15; 203: 339–342. doi:10.1016/j.amjcard.2023.07.037.

Trends in the Longitudinal Utilization of Oral Anticoagulants Among Newly Diagnosed Atrial Fibrillation Patients With Commercial, Medicare, and Medicaid Insurance

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Long-term oral anticoagulation (OAC) is recommended for stroke prevention for most patients with atrial fibrillation (AF) and elevated stroke risk.[1] While trends in initiation of OAC have been described,[2,3] long-term trends in utilization of OAC in patients continuously followed for AF have not been adequately explored. Some healthcare systems adapted anticoagulation services to respond to disruptions during the COVID-19 pandemic.[4] We thus investigated how OACs were utilized in patients with newly diagnosed AF from 2018 to 2021 across 3 insurance types: Medicare, Medicaid, and commercial.

Methods

All data were deidentified and the study was exempt from review by the Institutional Review Board of the Centers for Disease Control and Prevention.

Data were extracted from the Merative MarketScan Commercial Claims and Encounters, Medicare Supplement, and Medicaid databases from January 1, 2018 to June 30, 2021.[5] Patients with a new diagnosis of AF from January 1, 2014, to December 31, 2017 (i.e., patient selection period), in the databases were selected. International Classification of Diseases, Ninth Revision, Clinical Modification of 427.3 (from January 2014 to September 30, 2015) and International Classification of Diseases, Tenth Revision, Clinical Modification

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Declaration of Competing Interest

The authors have no conflicts of interest to declare.

Supplementary materials

Supplementary material associated with this article can be found in the online version at https://doi.org/10.1016/j.amjcard.2023.07.037.

of I48 (from October 1, 2015, to December 31, 2017) were used to identify AF diagnosis. Patients were identified as AF if there were at least one inpatient or emergency department visits or 2 outpatient visits at least 7 to 365 days apart from January 1, 2014, to December 31, 2017. We restricted patients to those continuously enrolled beginning 180 days before the date of first AF diagnosis to June 30, 2021. More details of the sample selection process and the corresponding diagnosis codes can be found in the supplementary materials and Appendix Table 1.

The differences in the proportions of patients with AF treated with each of the 5 FDA approved OACs (apixaban, dabigatran, edoxaban, rivaroxaban, or warfarin), and any OAC from January 2018 to June 2021 (December 2020 for patients in Medicaid) were tested using Welch's 2-tail *t* test by insurance types. Summary statistics are provided of the medical costs and utilization of services and Charlson co-morbidity scores of AF patients with and without OAC prescription in 2019, the most recent year before the COVID-19 pandemic (the results are similar in other years and available upon request to the corresponding author). A $p < 0.05$ indicates statistical significance. All analyses were conducted using Stata MP statistical software version 14.2 (StataCorp, College Station, Texas) in 2022 to 2023.

Results

A total of 15,974 AF patients with commercial insurance (11,193 patients; 12% OAC users in January 2018), Medicare (1488 patients; 20% OAC users in January 2018), and Medicaid (3,293 patients; 15% OAC users in January 2018) were included and followed (Table 1). Compared to non-OAC users, OAC users had higher medical costs, healthcare utilization, and Charlson Comorbidity Index scores for all insurance types (Table 1). From January 2018 to June 2021, utilization of any OAC increased significantly (29.6% among commercially ensured, 48.8% for those in Medicare, and 31.5% for Medicaid enrollees). Apixaban use had the highest percentage increase (42.9% for commercial insurance, 66.5% for Medicare, 63.2% for Medicaid). At the end of follow-up period in 2021, the OAC utilization rates by insurance types ranged between 16% and 29% (Figure 1).

Discussion

This study estimates long-term OAC utilization in patients with incident AF by 3 insurance types. OAC use increased in all insurance types, with the highest overall increase among Medicare beneficiaries. Among OACs, the highest increase occurred in apixaban use, which is consistent with previous trends during 2010 to 2017.[3] Despite the significant increase in OAC use, utilization remained low. The drivers for the persistent underuse or delay in initiation require further research.

Our observed increases in apixaban use and decreases in warfarin and dabigatran use are consistent with several other previous studies in the United States.[3,6] These trends may be attributed to the American College of Cardiology and American Heart Association guideline recommendation of a direct OAC use over warfarin.[1]

Limitations of this study include it is a descriptive study and the restriction to patients who were continuously covered by the same insurance during 2018 to 2021. This restriction also resulted in the exclusion of some groups of patients (e.g., uninsured and with capitated insurance plans).

Given the high burden of stroke in the United States and the strong evidence for OAC use in patients with AF and elevated stroke risk, patient, clinician, and health system interventions are needed to improve prescribing of and adherence to OACs.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgment

The authors are genuinely grateful to Michael Schooley, MPH, Kakoli Roy, PhD, Fatima Coronado, MD, MPH, and Adam Vaughan, PhD, MPH, MS (Centers for Disease Control and Prevention) for their guidance, suggestions, and article review.

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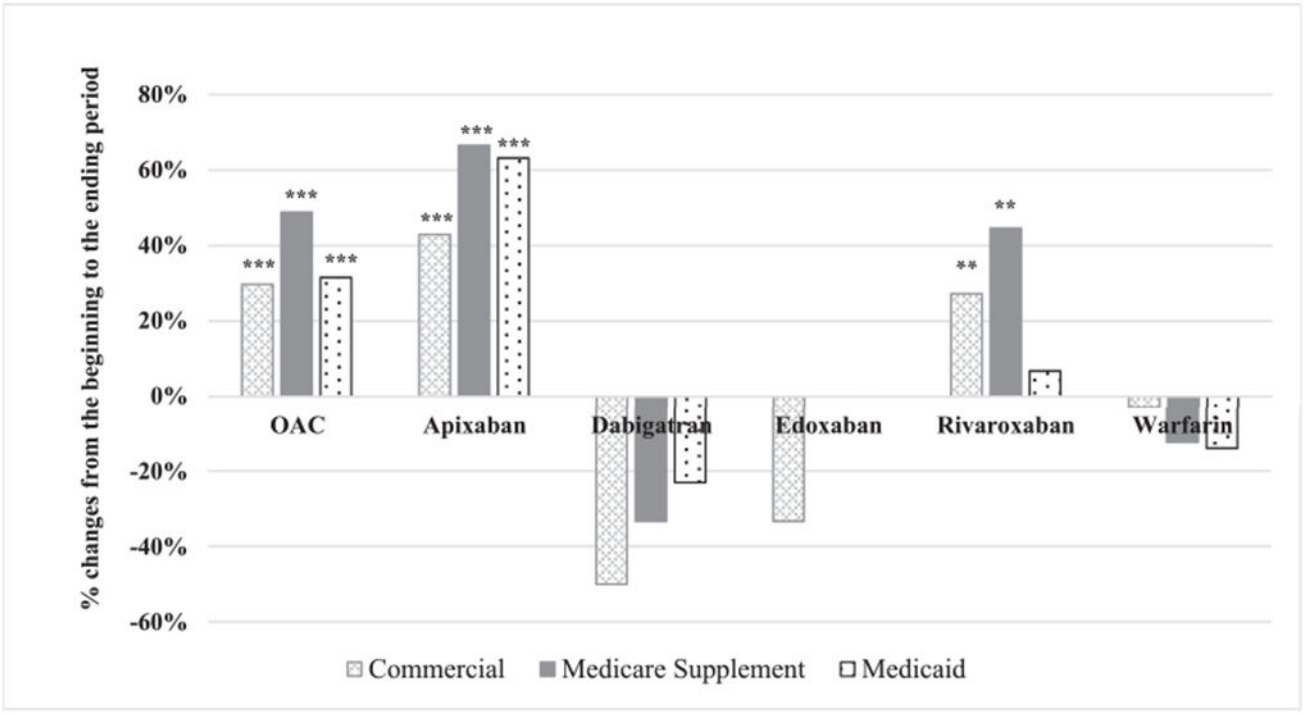

	Commercial		Medicare Supplement		Medicaid	
	Jan-18	Jun-21	Jan-18	Jun-21	Jan-18	Dec-20
OAC	12.2%	15.8%	19.7%	29.3%	14.6%	19.3%
Apixaban	6.4%	9.2%	11.8%	19.7%	7.3%	11.8%
Dabigatran	0.4%	0.2%	0.8%	0.5%	0.4%	0.3%
Edoxaban	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rivaroxaban	3.9%	5.0%	5.0%	7.2%	4.9%	5.3%
Warfarin	1.5%	1.4%	2.2%	1.9%	2.2%	1.9%

Figure 1.

The percentage changes of the proportion of patients treated with oral anticoagulants among patients with atrial fibrillation, by insurance type, January 2018 to June 2021.

*p <0.05.

**p <0.01.

***p <0.001.

Note: On the *y* axis, we report the percentage change from the beginning to the ending periods. For all 3 insurances, the beginning date is January 2018. For Commercial and

Medicare Supplement, the ending period is June 2021. For Medicaid, the ending period is December 2020. Patients in MarketScan Commercial and Medicare Supplement/Advantage continuously enrolled in MarketScan Commercial Claims and Encounters Database from January 1, 2018, to June 30, 2021. Patients in Medicaid database continuously enrolled in MarketScan Multi-States Medicaid Database from January 1, 2018, to December 31, 2020. There are 11,193, 1,488, and 3,293 patients with established hypertension for commercial insurance, Medicare Supplement/Advantage, and Medicaid, respectively, used for the analysis. Patients with AF were defined if inpatient or emergency department encounters contained at least one diagnosis of AF (ICD-10-CM I48) or at least 2 outpatient encounters contained the diagnosis of AF with at least 30-day intervals during the 4 years of lookback periods from January 1, 2014, to December 31, 2017. ICD-10-CM = International Classification of Diseases, Tenth Revision, Clinical Modification.

Table 1

Summary Statistics among Patients with atrial fibrillation by the prescription status of oral anticoagulant treatment in 2019 by insurance type

	Commercial			Medicare Supplement			Medicaid		
	OAC in 2019 = No N=8,330 (74.4%)	**OAC in 2019 = Yes N=2,863 (25.6%)**	**p-value**	**OAC in 2019 = No N=814 (54.7%)**	**OAC in 2019 = Yes N=674 (45.3%)**	**p-value**	**OAC in 2019 = No N=2,403 (73.0%)**	**OAC in 2019 = Yes N=890 (27.0%)**	**p-value**
Medical costs and utilization of services in 2019, Mean (SD)									
Total Medical Payments	$15,595.6 (43546.1)	$36,087.5 (70680.3)	<0.001	$16,291.7 (28725.5)	$24,437.7 (26777.5)	<0.001	$33,108.1 (45943.8)	$46,658.4 (53697.2)	<0.001
Total Inpatient Payments	$3,000.1 (21873.3)	$9,990.2 (43240.3)	<0.001	$3,678.9 (11620.7)	$4,967.7 (11953.8)	0.036	$6,497.8 (18571.3)	$14,198.3 (39158.4)	<0.001
Total ED Payments	$966.7 (3807.6)	$1,425.8 (3681.3)	<0.001	$546.5 (1492.2)	$792.8 (1996.9)	0.007	$1,908.3 (4921.1)	$2,239.5 (5741.4)	0.1
Total Outpatient Payments	$7,339.8 (26791.2)	$15,786.1 (41504.5)	<0.001	$8,334.6 (19269.7)	$10,399.1 (16275.9)	0.028	$15,488.9 (30548.1)	$16,918.0 (25463.4)	0.21
Total Pharmacy Payments	$3,830.1 (13806.7)	$8,231.1 (13776.8)	<0.001	$3,570.6 (10641.5)	$8,107.6 (9705.3)	<0.001	$8,563.8 (19381.4)	$12,660.2 (18516.0)	<0.001
Number of Inpatient Encounters	0.1 (0.5)	0.3 (0.7)	<0.001	0.2 (0.6)	0.3 (0.6)	<0.001	0.8 (2.0)	1.3 (2.1)	<0.001
Number of ED Encounters	0.4 (1.2)	0.6 (1.3)	<0.001	0.7 (1.5)	1.0 (2.0)	0.001	2.7 (6.2)	2.8 (5.7)	0.73
Number of Outpatient Encounters	14.9 (19.4)	21.0 (20.5)	<0.001	26.2 (29.7)	31.7 (33.1)	<0.001	72.5 (106.0)	82.5 (105.0)	0.015
Number of Pharmacy Encounters	23.9 (24.9)	41.5 (28.6)	<0.001	31.8 (29.5)	45.2 (26.8)	<0.001	83.7 (85.1)	120.7 (88.0)	<0.001
Charlson Comorbidity Index (CCI) scores in 2019, N (%)									
Charlson Comorbidity Index Score=0, N (%)	4,736 (56.85%)	945 (33.01%)	<0.001	245 (30.10%)	132 (19.58%)	<0.001	608 (25.30%)	73 (8.20%)	<0.001
Charlson Comorbidity Index Score=1, N (%)	1,712 (20.55%)	785 (27.42%)	<0.001	138 (16.95%)	142 (21.07%)	0.043	413 (17.19%)	105 (11.80%)	<0.001
Charlson Comorbidity Index Score=2, N (%)	794 (9.53%)	414 (14.46%)	<0.001	119 (14.62%)	119 (17.66%)	0.11	356 (14.81%)	130 (14.61%)	0.88
Charlson Comorbidity Index Score>=3, N (%)	1,088 (13.06%)	719 (25.11%)	<0.001	312 (38.33%)	281 (41.69%)	0.19	1,026 (42.70%)	582 (65.39%)	<0.001
Charlson Comorbidity Index Score, Mean (SD)	1.0 (1.7)	1.7 (2.1)	<0.001	2.4 (2.6)	2.6 (2.3)	0.1	2.8 (2.8)	4.1 (2.9)	<0.001

The p-values represent the test results of the differences in means and proportions. We used the Wilcoxon non-parametric rank-sum test for continuous variables and Pearson's chi-squared test CCI categorical variables. Total medical payments are the average of payments in 2019. Total inpatient, ED, outpatient, and pharmacy payments are the average of the total inpatient, ED, outpatient, and pharmacy payments in 2019. The number of inpatients, ED, outpatient, and pharmacy visits are the average numbers of inpatient, ED, outpatient, and pharmacy visits in 2019.