BRIEF REPORT

Racial/ethnic differences in patients undergoing left atrial appendage occlusion

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Introduction

Racial and ethnic inequities have been reported in atrial fibrillation (AF) management. Percutaneous left atrial appendage occlusion (LAAO) provides mechanical stroke prophylaxis for AF patients who cannot tolerate long-term oral anticoagulants because of bleeding, but the technology may not be equally accessible to eligible patients. We hypothesize that compared to White individuals, Black and Hispanic individuals have greater comorbidity burden by the time they receive LAAO, and they may be more likely to experience in-hospital adverse outcomes. To address this knowledge gap, we aimed to determine racial and ethnic differences in prevalence of comorbidities and in-hospital adverse outcomes.

KEY FINDINGS

- Use of left atrial appendage occlusion (LAAO) is limited in Black individuals >75 years compared with White individuals.
- The percentage of Black women receiving LAAO was significantly higher than in other racial/ethnic groups.
- Black individuals were more likely to experience bleeding complications and most likely to receive warfarin plus antiplatelet than White individuals.

Methods

This study was approved by the institutional review board of Boston University and adhered to the Helsinki Declaration. Waiver of informed consent was obtained as the research posed minimal risk and was not possible without waiver. We analyzed the national, claims-based Premier Healthcare Database of individuals who received LAAO in 2016–2020. We identified inpatient encounters for LAAO implantation using International Classification of Diseases, Tenth Revision Procedure Coding System (ICD-10-PCS) procedure code 02L73DK and with any diagnosis of AF or atrial flutter (hereafter called "LAAO cohort"). We abstracted information on baseline patient and hospital-level characteristics. Frailty was measured using claims-based surrogates.[1] We captured the following inpatient outcomes: ischemic stroke, systemic embolism, intracranial hemorrhage, bleeding requiring transfusion, pericardial effusion with or without drainage, cardiac arrest, death, length of stay, and discharge status. For in-hospital antithrombotic medications, we captured prescriptions for warfarin, direct oral anticoagulants, aspirin, and oral $P2Y_{12}$ inhibitors. Patients were stratified into 5 races/ethnicities: Non-Hispanic White, Non-Hispanic Black, Hispanic, Asian, and Other. We compared baseline patient- and hospital-level characteristics, inpatient outcomes, and antithrombotic medications using Pearson χ^2 or Fisher exact tests for categorical variables and Kruskal-Wallis tests for continuous variables.

Results

There were 20,065 patients in the LAAO cohort: 1.2% Asian, 4.6% Black, 3.2% Hispanic, and 88% White (Table 1). Black recipients were significantly younger. Only 44.3% of Black recipients were >75 years, whereas the majority (61%) of White recipients were >75 years. The percentage of women among Black recipients was higher than in any other racial/ethnic group. Black recipients were most likely to have chronic kidney disease, obstructive pulmonary disease, diabetes, heart failure, and hypertension.

KEYWORDS Anticoagulation; Atrial fibrillation; Left atrial appendage occlusion; Racial disparities; Stroke prevention (Heart Rhythm O^2 2024;5:321–323)

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https://doi.org/10.1016/j.hroo.2024.04.004

Table 1 Patient- and hospital-level characteristics stratified by race/ethnicity

Characteristics	Race/ethnicity					*P* value
	Asian	Black, non-Hispanic	Hispanic	Other	White, non-Hispanic	
No. of patients (% of total cohort)	236 (1.2)	915 (4.6)	639 (3.2)	711 (3.5)	17564 (87.5)	
Patient-level characteristics						
Mean age (y)	74.3 ± 9.0	72.0 ± 9.3	75.0 ± 8.6	75.0 ± 9.1	76.1 ± 7.5	<.0001
<65 y	31 (13.1)	180 (19.7)	65 (10.1)	79 (11.1)	1,049 (6.0)	
65–74 y	82 (34.7)	330 (36.1)	214 (33.5)	236 (33.2)	5,796 (33.0)	
≥75 y	123 (52.1)	405 (44.3)	360 (56.3)	396 (55.7)	10,719 (61.0)	
Women	79 (33.5)	458 (50.1)	286 (44.8)	310 (43.6)	7,326 (41.7)	<.0001
Insurance status						
Medicare	195 (82.6)	798 (87.2)	573 (89.7)	611 (85.9)	16,095 (91.6)	<.0001
Medicaid	>10*	36 (3.9)	16 (2.5)	25 (3.5)	198 (1.1)	
Private/commercial	25 (10.6)	63 (6.9)	42 (6.6)	48 (6.8)	903 (5.1)	
Charity/self-pay or other	<5*	18 (2.0)	8 (1.3)	27 (3.8)	368 (2.1)	
Chronic kidney disease	63 (26.7)	354 (38.7)	159 (24.9)	189 (26.6)	3,918 (22.3)	<.0001
Chronic obstructive pulmonary disease	22 (9.3)	194 (21.2)	80 (12.5)	137 (19.3)	3,147 (17.9)	<.0001
Diabetes	104 (44.1)	459 (50.2)	292 (45.7)	276 (38.8)	6,136 (34.9)	<.0001
Frailty	18 (7.6)	73 (8.0)	71 (11.1)	74 (10.4)	1,624 (9.2)	.18
Heart failure	73 (30.9)	432 (47.2)	198 (31.0)	242 (34.0)	5,774 (32.9)	<.0001
Hypertension	209 (88.6)	861 (94.1)	570 (89.2)	637 (89.6)	15,256 (86.9)	<.0001
Ischemic heart disease	89 (37.7)	396 (43.3)	298 (46.6)	338 (47.5)	8,257 (47.0)	.012
Peripheral vascular disease	26 (11.0)	170 (18.6)	89 (13.9)	133 (18.7)	3,274 (16.3)	.007

Values are given as n (%) or mean ± SD unless otherwise indicated.

*Per the cell suppression policy of the Premier Healthcare Database (PHD), counts <5 are not reported. Because the column total is known, an additional cell under the same category counter-suppressed in compliance with the Centers for Medicare & Medicaid Services Cell Suppression Policy (https://www.hhs.gov/guidance/document/cms-cell-suppression-policy).

There was no difference in frailty among groups. Black individuals tended to have Medicaid or private/commercial insurance and to be treated at large, teaching hospitals (Supplemental Table 1).

The risks of thromboembolic complications, intracranial hemorrhage, cardiac arrest, and death were very small across groups (Table 2). Bleeding requiring transfusion was highest in Black individuals. Although Black and Hispanic individuals had longer length of stay, most were discharged within 2 days. Nearly all patients were discharged home after LAAO (Supplemental Table 2). Black patients were most likely to receive warfarin plus antiplatelet. Hispanic patients were most likely to receive dual antiplatelet therapy (DAPT), but use of DAPT also was higher among Black individuals.

Table 2 Inpatient outcomes and antithrombotic medication use stratified by race/ethnicity

Characteristics	Race/ethnicity					*P* value
	Asian	Black, non-Hispanic	Hispanic	Other	White, non-Hispanic	
No. of patients (% of total cohort)	236 (1.2)	915 (4.6)	639 (3.2)	711 (3.5)	17,564 (87.5)	
Ischemic stroke, systemic embolism, and intracranial hemorrhage	<5*	6 (0.7)	7 (1.1)	8 (1.1)	130 (0.7)	.43
Bleeding requiring transfusion	12 (5.1)	92 (10.1)	55 (8.6)	43 (6.0)	1,349 (6.7)	.0002
Pericardial effusion						
Any	13 (5.5)	43 (4.7)	23 (3.6)	24 (3.4)	598 (3.4)	.23
Requiring drainage	5*	16 (1.7)	3 (0.5)	5 (0.7)	187 (1.1)	.12
Cardiac arrest and death	<5*	6 (0.7)	6 (0.9)	0	44 (0.3)	<.0001
Length of stay (d)	1.3 ± 1.5	1.5 ± 1.5	1.4 ± 2.1	1.3 ± 1.0	1.3 ± 1.4	<.0001
Antithrombotic medications						
Warfarin plus antiplatelet	49 (20.8)	259 (28.3)	138 (21.6)	187 (26.3)	4,492 (25.6)	<.0001
DOAC plus antiplatelet	66 (28.0)	247 (27.0)	202 (31.6)	193 (27.1)	4,817 (27.4)	
Warfarin only	16 (6.8)	107 (11.7)	43 (6.7)	90 (12.7)	1,887 (10.7)	
DOAC only	47 (19.9)	118 (12.9)	85 (13.3)	82 (11.5)	2,414 (13.7)	
Dual antiplatelet therapy	14 (5.9)	65 (7.1)	73 (11.4)	50 (7.0)	1,038 (5.9)	
Other	44 (18.7)	119 (13.0)	98 (15.3)	109 (15.3)	2,916 (16.6)	

Values are given as n (%) or mean ± SD unless otherwise indicated.

DOAC = direct oral anticoagulant.

*Per the cell suppression policy of the Premier Healthcare Database (PHD), counts <5 are not reported.

Discussion

In the current study, we report the number and characteristics of Black vs White LAAO recipients. Our main findings include limited use of LAAO in Black individuals >75 years and a greater burden of comorbidities in Black than White individuals. Black individuals were more likely to experience bleeding complications and to receive warfarin plus antiplatelet.

Our findings are consistent with previous studies, which demonstrated persistent disparities in care and highlighted the need for action.[2,3] Black and/or Hispanic individuals are less likely to receive treatment for AF, including antiarrhythmic drugs, catheter ablation, and anticoagulation.[4,5] Racial differences in referral patterns, access to specialty care, self-advocacy, and confidence in the U.S. healthcare system may limit LAAO use in Black individuals.

Low utilization in Black patients >75 years warrants further study. Black individuals have the highest prevalence of cardiovascular and noncardiovascular comorbidities at incident AF and may be perceived to not benefit from LAAO or be too sick to undergo the procedure. Older Black individuals may underestimate their bleeding risk than their White counterparts.[6]

Finally, increased use of DAPT in Black and Hispanic patients is unexplained but may be due to perceived elevated risk of postimplant bleeding. Whether such treatment increases risk of device thrombus or thromboembolic complication needs further investigation.

Study limitations

Misclassification from inaccurate coding or missing data may have occurred in this claims-based study. The Premier Healthcare Database only includes inpatient baseline comorbidities, and we were not able to reliably identify history of stroke or bleeding or the fraction of population eligible for LAAO.

Funding Sources: This work was supported by an investigator-initiated research grant from Boston Scientific to Boston Medical Center. The funders had no role in design, collection, analysis, interpretation of the data, or decision to submit for publication.

Disclosures: Drs Helm and Ko report an investigator-initiated research grant from Boston Scientific Corporation to their institution. Dr Helm reports investigator-initiated research funding from Cardathea to his institution for unrelated work. Dr Kim reports research grants from the National Institutes of Health and personal fee from Alosa Health and VillageMD, all for unrelated work. All other authors have no conflicts of interest to disclose.

Authorship: All authors attest they meet the current ICMJE criteria for authorship.

Patient Consent: Waiver of informed consent was obtained as the research posed minimal risk and was not possible without waiver.

Ethics Statement: This study was approved by the institutional review board of Boston University and adhered to the Helsinki Declaration.

Appendix

Supplementary data

Supplementary data associated with this article can be found in the online version at https://doi.org/10.1016/j.hroo.2024.04.004.

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