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LESS IS MORE

Anticoagulant Use for Atrial Fibrillation Among Persons With Advanced Dementia at the End of Life

Atrial fibrillation (AF) affects almost 20% of individuals with dementia.¹ By virtue of their age and comorbidities, nearly all patients with AF and dementia meet the threshold stroke risk, as estimated by the CHA₂DS₂-VASC score (a score to predict annual stroke risk in persons with AF based on the following risk factors: congestive heart failure, hypertension, age [>65 years = 1 point; >75 years = 2 points], diabetes, previous stroke or transient ischemic attack [2 points], vascular disease),² for which guidelines recommend anticoagulation.³ As dementia progresses, function is gradually but irretrievably lost, so that the potential benefits of preventing a stroke become increasingly attenuated. In advanced dementia, patients develop profound cognitive deficits; require help with basic self-care activities, including eating; and have a very limited life expectancy.⁴ Our objective was to determine how often anticoagulation is continued among nursing home residents in this final stage of life and to examine clinical associations of its use.

Methods | In this cross-sectional study, we used Medicare data to identify nursing home residents 65 years or older with advanced dementia and AF who had at least moderate stroke risk (CHA₂DS₂-VASC score ≥ 2), and who died between January 1, 2014, and December 31, 2017. Advanced dementia was defined as a diagnosis of Alzheimer disease or another dementia, Cognitive Performance Score of 5 or 6,⁵ and dependence in all activities of daily living on 2 Minimum Data Set assessments within the last 6 months of life. We used Chronic Condition Warehouse flags to ascertain AF. We excluded resi-

dents not enrolled in fee-for-service Medicare and those with claims for venous thromboembolism and valvular heart disease (including mechanical valves) in the 2 years before death. This study was approved by the institutional review boards at Yale University and the VA Connecticut Healthcare System, which waived the need for informed consent owing to the use of deidentified data. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guideline.

Data were analyzed from October 1 to December 30, 2020. The CHA₂DS₂-VASC score (for stroke risk) and the ATRIA (Anticoagulation and Risk Factors In Atrial Fibrillation) score, which is used to predict annual bleeding risk among anticoagulated persons with AF (based on age ≥ 75 years [2 points], anemia [3 points], renal disease [3 points], prior bleeding [1 point], and hypertension [1 point]), were calculated using Chronic Condition Warehouse flags to identify comorbidities in each.^{2,6} Bleeding history, part of the ATRIA score, was determined using inpatient billing codes from the 2 years prior to death.⁶ We ascertained anticoagulant use from Minimum Data Set item NO410E on assessments in the last 6 months of life. Other clinical factors were obtained from Minimum Data Set assessments during the same period. We modeled the associations between anticoagulant use and patient characteristics (selected a priori) using multivariable logistic regression in Stata, version 15 (StataCorp LLC). A 2-sided $P < .05$ in the multivariable logistic regression model as determined by a Wald χ^2 test, denoted statistical significance.

Results | Among 15 217 nursing home residents with AF and advanced dementia (mean [SD] age, 87.5 [6.76] years; 10 384 women [68.2%]), 5033 (33.1%) received an anticoagulant in the last 6 months of life. The **Table** shows patient characteristics by anticoagulation status, along with adjusted odds ratios (ORs) for anticoagulant use. In multivariable logistic regression, higher CHA₂DS₂-VASC (score >7 , OR, 1.38 [95% CI, 1.23-1.54]) and ATRIA (score >7 , OR, 1.25 [95% CI, 1.13-1.39]) scores, nursing home length of stay of at least 1 year (OR, 2.68 [95% CI, 2.48-2.89]), not having Medicaid (OR, 1.59 [95% CI, 1.45-1.69]), weight loss (OR, 1.09 [95% CI, 1.01-1.18]), pressure ulcers (OR, 1.37 [95% CI, 1.27-1.48]), and difficulty swallowing (OR, 1.12 [95% CI, 1.02-1.22]) were associated with greater odds of anticoagulant use. Conversely, older age (80-89 y, OR, 0.82 [95% CI, 0.74-0.92]; ≥ 90 y, OR, 0.59 [95% CI, 0.52-0.66]), female sex (OR, 0.88 [95% CI, 0.81-0.95]), requiring restraints (OR, 0.79 [95% CI, 0.66-0.95]), and being enrolled in hospice (OR, 0.76 [95% CI, 0.70-0.83]) were associated with lesser odds of anticoagulant use.

Discussion | In this cross-sectional study, we found that almost one-third of nursing home residents with AF and advanced dementia remained on anticoagulation in the last 6 months of life. Nursing home length of stay at least 1 year and not having Medicaid were more strongly associated with anticoagulant use than CHA₂DS₂-VASC score. Greater bleeding risk, counterintuitively, was associated with greater odds of anticoagulant use. With the notable exception of hospice use, most indicators of high short-term mortality, such as difficulty swallow-

Table. Demographic and Clinical Characteristics by Anticoagulant Use

Characteristic	No. (%)		Adjusted OR (95% CI)
	Anticoagulation in the last 6 mo of life (n = 5033)	No anticoagulation in the last 6 mo of life (n = 10 184)	
Age (overall), y			
<80	785 (15.6)	1142 (11.2)	1 [Reference]
80 to 89	2560 (50.9)	4541 (44.6)	0.82 (0.74-0.92)
≥90	1688 (33.5)	4501 (44.2)	0.59 (0.52-0.66)
Female sex	3259 (64.8)	7125 (70.0)	0.88 (0.81-0.95)
Race/ethnicity			
White	4325 (85.9)	8839 (86.8)	1 [Reference]
Black	473 (9.4)	861 (8.5)	0.97 (0.85-1.10)
Asian	77 (1.5)	173 (1.7)	0.80 (0.60-1.07)
Hispanic	101 (2.0)	208 (2.0)	0.97 (0.75-1.25)
Other/missing ^a	57 (1.1)	103 (1.0)	1.06 (0.75-1.50)
Non-Medicaid status	1916 (38.1)	3287 (32.3)	1.59 (1.45-1.69)
>1 y in nursing home	2154 (42.8)	2399 (23.6)	2.68 (2.48-2.89)
CHA ₂ DS ₂ VASC score ^b			
<4	681 (13.5)	1661 (16.3)	1 [Reference]
5-6	1914 (38.0)	4242 (41.7)	1.10 (0.99-1.23)
>7	2438 (48.4)	4281 (42.0)	1.38 (1.23-1.54)
ATRIA score ^c			
<3	796 (15.8)	2205 (21.7)	1 [Reference]
4-6	1690 (33.6)	3584 (35.2)	1.19 (1.07-1.32)
>7	2547 (50.6)	4395 (43.2)	1.25 (1.13-1.39)
Other clinical factors			
Rejection of care	454 (9.0)	844 (8.3)	1.03 (0.91-1.17)
Falls	1690 (33.6)	3214 (31.6)	1.04 (0.96-1.12)
Weight loss	1856 (37.0)	3363 (33.5)	1.09 (1.01-1.18)
Pressure ulcer	2052 (40.8)	3228 (31.7)	1.37 (1.27-1.48)
Difficulty swallowing	1136 (22.6)	2008 (19.8)	1.12 (1.02-1.22)
Restraint use	189 (3.8)	433 (4.3)	0.79 (0.66-0.95)
Hospice use	1296 (25.8)	3375 (33.1)	0.76 (0.70-0.83)

Abbreviation: OR, odds ratio.

^a Other includes American Indian, Alaskan Native, Native Hawaiian, or Pacific Islander.

^b The CHA₂DS₂VASC score predicts annual stroke risk among persons with atrial fibrillation using the following risk factors: congestive heart failure, hypertension, age [≥65 years = 1 point; >75 years = 2 points], diabetes, previous stroke or transient ischemic attack [2 points], and vascular disease.

^c The ATRIA (Anticoagulation and Risk Factors In Atrial Fibrillation) bleeding risk score predicts annual bleeding risk among persons anticoagulated for atrial fibrillation using the following risk factors: age ≥75 years (2 points), anemia (3 points), renal disease (3 points), prior bleeding (1 point), and hypertension (1 point).

ing, weight loss, and pressure ulcers, were associated with greater odds of anticoagulant use.

These findings underscore the fact that, while practice guidelines contain a well-defined threshold for starting anticoagulation for AF, there is no clear standard for stopping it. Clinicians are instead asked to engage in shared decision-making with patients and their families.³ Data about the benefits and harms of therapy are essential to that process. For patients with dementia, little such evidence is available, although the magnitudes of benefits and harms are likely to change substantially as the disease progresses. This study is limited by its cross-sectional design and includes only persons with AF and advanced dementia in the nursing home setting. Nonetheless, our work points to the need for high-quality data to inform decision-making about anticoagulation in this population.

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Editor's Note

Anticoagulation at the End of Life: Time for a Rational Framework

Are there patients for whom common sense suggests that the downsides of anticoagulation clearly outweigh the benefits? This is the premise suggested by Ouellet et al¹ in this issue of *JAMA Internal Medicine*. In a decedent cohort of older nursing home residents with advanced dementia and atrial fibrillation, they found that one-third remained on therapeutic anticoagulation during the last 6 months of life. Those who had longer duration of nursing home residence or had markers of more severe dementia were more likely to remain on anticoagulation at the end of life.

The risks and benefits of therapeutic anticoagulation in severe dementia and other life-limiting illnesses have not been well studied. In real-world practice, many patients with severe dementia have limited life expectancy and would choose to focus on quality of life. However, avoiding the potential morbidity of stroke may still be within patients' and families' goals at the end of life. Others might argue that for those with limited prognosis, drugs for chronic conditions that do not directly target symptoms, such as dyspnea or pain, increase the risk of adverse events without clear benefit.

These findings highlight the lack of a rational strategy for managing anticoagulation in those with limited life expectancy owing to age or illness. Guidelines suggest periodic reevaluation of anticoagulation to reassess stroke and bleeding risks.² However, there is a dearth of information on how to implement this because seriously ill, frail patients are understudied in both clinical trials and observational research.

Traditionally, the net clinical benefit of anticoagulation is driven by difference between ischemic stroke reduction and intracranial hemorrhage risk.² A more patient-centered framework would expand this narrow definition of net clinical benefit. Consideration of the competing risk of death from other causes, such as dementia or cancer, decreases the net clinical benefit of anticoagulation and should be incorporated.³ Clinicians already report considering geriatric syndromes such as disability and cognitive impairment during risk assessment for anticoagulation, so these should be formally integrated, given their impact on quality of life.⁴ The bleeding events we factor in should not be limited to intracranial hemorrhage because extracranial and so-called nuisance bleeding are common and highly bothersome to patients and can diminish quality of life and well-being. Studies of decision-making aids and dose reduction or deprescribing clinical trials using this expanded net benefit definition should be performed in this population.

Balancing the tradeoffs required for anticoagulation will remain challenging in patients with limited life expectancy. Our goal should be a framework that combines quantitative information with patients' values to guide clinicians and patients toward individualized and informed decisions.

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