

Oral Anticoagulant Use in Atrial Fibrillation-Associated Ischemic Stroke: A Retrospective, Multicenter Survey in Northwestern China

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Background: Anticoagulation therapy has been recommended by major guidelines to reduce the risk of recurrent stroke in patients with atrial fibrillation-associated ischemic stroke (AFAIS). However, in real-world clinical practice, oral anticoagulants with either vitamin K antagonists or nonvitamin K antagonists are often underused for these patients. Here, we sought to investigate the current status of oral anticoagulant use in patients with AFAIS in northwestern China. **Methods:** We reviewed medical records of consecutive patients with AFAIS discharged from 14 hospitals in northwestern China between January 2012 and May 2015. **Results:** A total of 1014 cases were included in this study. The mean age of the patients was 70.3 ± 10.8 years. Fifty-four percent were female. Among all participants, only 20.0% received anticoagulants (19.4% warfarin and .6% nonvitamin K antagonist oral anticoagulants), whereas 57.5% took antiplatelet drugs and 22.5% received neither anticoagulant nor antiplatelet treatment. Anticoagulant use decreased with increasing age and CHA2DS2-VASc scores. The proportions of anticoagulant use at discharge in patients younger than 65 years, 65-74 years, and 75 years or older were 28.5%, 20.7%, and 13.9%, respectively. Nonvalvular atrial fibrillation patients with CHA2DS2-VASc scores of 2, 3, 4, 5, 6, and 7 had anticoagulant use rates at discharge of 19.2%, 24.8%, 20.3%, 13.7%, 8.1%, and 8.0%, respectively. **Conclusions:** In northwestern China, oral anticoagulants are substantially underutilized in patients with AFAIS, especially in patients at higher risk of stroke, suggesting a large treatment gap in the secondary prevention management in patients with AFAIS. **Key Words:** Atrial fibrillation—stroke—northwestern China—secondary prevention—anticoagulants.

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Introduction

Atrial fibrillation (AF) is one of the most common cardiac arrhythmias encountered in clinical practice.¹ Epidemiological data indicate that the global annual incidence of AF is approximately 59.5 per 100,000 females and 77.5 per 100,000 males.² In China, the annual incidence of AF is 50 per 100,000 people.³ The prevalence increases markedly with age, ranging from .1% in patients younger than 55 years to 9.0% in those over 80 years.⁴ An adverse consequence of AF that is of primary concern is ischemic stroke (IS). IS can occur at any point during the clinical course of AF. Independent of other risk factors, AF generates a 5- to 6-fold increased risk of IS⁵ and may be

responsible for at least 15% of all strokes each year.⁶ Atrial fibrillation-associated ischemic stroke (AFAIS) can cause long-term disability and often has a high mortality.⁷ Moreover, the risk of recurrent stroke in patients with AFAIS is high, ranging from 10% to 20% during the first year.⁸⁻¹¹ Mortality in patients with recurrent stroke is almost 3 times higher than mortality in AFAIS patients without recurrent stroke (70.8% versus 24.4%).¹² Thus, secondary prevention for patients with a history of AFAIS is important.

Guidelines from the American Heart Association and the American Stroke Association recommend anticoagulation treatment with a vitamin K antagonist, such as warfarin, for secondary prevention of AFAIS.¹³ Although the efficacy of warfarin has been established, it is often underused in the secondary prevention of AFAIS because of the need for careful adherence and monitoring of a narrow therapeutic window. A prospective cohort study of 2162 patients with AFAIS from the Ontario Stroke Registry found that only 39.3% of patients were prescribed warfarin and 30% were not prescribed any oral anticoagulant therapy (OAT) at discharge.¹⁴ A longitudinal cohort from the Adherence Evaluation After Ischemic Stroke Longitudinal Registry found that 77.7% of patients with AFAIS were using warfarin at 12 months after hospital discharge.¹⁵ In the present study, we aimed to investigate secondary prevention regimens in patients with AFAIS at hospital discharge in northwestern China.

Materials and Methods

Participants

A retrospective multicenter survey was conducted in patients with AFAIS who were admitted to 14 tertiary hospitals located in northwestern China between January 2012 and May 2015. Patients were eligible for enrollment in the study if they met the following criteria: (1) age older than 18 years, (2) IS confirmed by brain computed tomography or magnetic resonance imaging, and (3) AF, defined as previously documented in the medical record or new-onset AF detected during hospitalization by a 12-lead electrocardiogram/24-hour Holter monitor. Patients were excluded if they died during hospitalization. This study protocol was approved by the ethics committees of each participating hospital. Due to the retrospective nature of the study, informed consent was waived.

Data Collection

Trained researchers reviewed medical records for documented antithrombotic prescriptions to evaluate the proportion of patients with AFAIS who received at least 1 antithrombotic drug: warfarin, nonvitamin K antagonist oral anticoagulants (NOACs), aspirin, or clopidogrel. Data collected from medical records included age, sex,

AF diagnosis, type of AF, medical history, length of hospital stay, admission time, time from stroke onset to hospital arrival, National Institutes of Health Stroke Scale (NIHSS) score at discharge and CHA2DS2-VASc score. The CHA2DS2-VASc score (cardiac failure or dysfunction [1 point], hypertension [1 point], age ≥ 75 years [2 points], diabetes [1 point], prior stroke/transient ischemic attack [2 points], vascular disease other than cerebrovascular disease [1 point], age 65-74 years [1 point], female sex [1 point]) was used for stroke risk stratification and determination of whether or not initiation of anticoagulation therapy was indicated.¹⁶

Statistical Analysis

Descriptive statistics were used to summarize the characteristics of all patients. The mean and standard deviation or median and interquartile range were used to describe continuous variables. Categorical variables were reported as frequency and percentage. Characteristics between patients with and without anticoagulation drugs were compared using the chi-square test or the Fisher exact test for categorical variables, or using the Student *t*-test or nonparametric test (Mann-Whitney *U*-test) for continuous variables. All statistical analyses were performed using SPSS 20.0 (IBM Corporation, Armonk, NY). A 2-tailed *P* value less than .05 was considered statistically significant.

Results

General Information

A total of 1048 patients with an AFAIS were enrolled in the present study between January 1, 2012, and May 30, 2015. Thirty-four patients who died during hospitalization were excluded. The mean age of the enrolled patients was 70.3 ± 10.8 years; 548 patients (54.0%) were female. Among all participants, 14.6% had valvular AF and 96.4% had nonparoxysmal (persistent or permanent) AF. The median length of hospital stay was 14 days, and the median time from stroke onset to hospital arrival was 17 hours. The median NIHSS score at discharge was 8 points. For nonvalvular atrial fibrillation (NVAF) patients, the mean CHA2DS2-VASc score was 4.5 ± 1.2 (Table 1).

Use of Anticoagulant for Secondary Stroke Prevention

Among all patients, 197 (19.4%) were prescribed warfarin at hospital discharge, 6 (.6%) were prescribed a NOAC (i.e., dabigatran or rivaroxaban). Patients who were not prescribed anticoagulation treatment were older, had a shorter length of hospital stay, had higher NIHSS and CHA2DS2-VASc scores, and were more likely to have NVAF and hypertension (all $P < .0001$). These patients also had a higher proportion of diabetes mellitus ($P = .038$) and coronary artery disease ($P = .006$) than those who

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