ORIGINAL RESEARCH

Adherence to Atrial Fibrillation Better Care (ABC) Pathway Management of Chinese Community Elderly Patients with Atrial Fibrillation: A Cross-Sectional Study

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Background: Investigating adherence to the Atrial Fibrillation Better Care (ABC) pathway management and identifying gaps between the real world and established guidelines can lead to better integrated management of AF. Current data on adherence to ABC pathway management among community elderly patients with atrial fibrillation (AF) in Chinese communities is limited.

Aim: To investigate the adherence to ABC pathway management among community elderly patients with AF in China.

Methods: In this cross-sectional study, data were collected from the 2020 National Basic Public Health Service Program database that includes health examination information for all residents >65 years of age in Yuexiu, Guangzhou, Guangdong Province. Demographic and clinical characteristics data from 197 community AF patients were obtained.

Results: Among the 197 AF patients, 103 (52.3%) were male, 117 (59.4%) were ≥75 years of age, 127 (64.5%) had a senior middle school education or above, 84.3% were married, and 195 (99.0%) had medical insurance. The most common comorbidities were hypertension (72.1%, 142/197), dyslipidaemia (28.4%, 56/197), CAD (28.9%, 57/197), and diabetes (24.9%, 49/197). In terms of the ABC management pathway, 21.8% (43/197), 82.7% (163/197), and 31.5% (62/197) of AF patients were classified into the A-adherent group, B-adherent group, and C-adherent group, respectively. The level of adherence to ABC pathway management was very low (9.1%, 18/197) and independently associated with age and multimorbidity.

Conclusion: The level of adherence to ABC pathway management in community elderly patients with AF was unsatisfactory. Further research is warranted to improve the integrated management of AF.

Keywords: atrial fibrillation, community, integrated management, elderly

Introduction

Atrial fibrillation (AF) is a type of supraventricular tachyarrhythmia caused by ineffective atrial contraction that results from uncoordinated atrial electrical activity.[1] According to 2020 data from the European Society of Cardiology (ESC), there are approximately 46.3 million AF patients worldwide, and this is projected to increase 2.3 times by 2060.[1] AF imposes a heavy burden on society and families,[2] with about 30% of AF patients hospitalized at least once each year.[1] The prevalence of AF increases with age. Results from the largest epidemiological study of AF in China found that the mean age of AF patients was 69.5±11.9 years.[3] Patients >60 years of age account for 81.6% of all cases.[4] It is critical that AF is effectively managed in elderly individuals.

AF can increase the risk of total death by 3.5 times and cause many complications, of which the most serious is stroke.[1] The risk of stroke is 4–5 times higher in patients with AF than those without and is associated with 20% mortality and 60% disability in this patient population.[1] Effective anticoagulation is associated with a 64% reduction in stroke risk and a 26% reduction in mortality.[1] The main symptoms of AF include palpitations, dyspnea, fatigue, chest tightness/pain, poor endurance and sleep disturbances, which reduce AF patients' quality of life.[5] There are many cardiovascular risk factors for AF.[1] Effective risk factor management can reduce the adverse outcomes of AF.[1]

The 2020 ESC guidelines suggested that the Atrial Fibrillation Better Care (ABC) pathway should be implemented for the integrated management of AF.[1] ABC pathway management includes three components: (A) Avoid stroke or anticoagulation, (B) Better symptom control using rate or rhythm control strategies, and (C) Cardiovascular and other comorbidity management.[1] A systematic review of 285,000 AF patients by Romiti et al[6] showed that adherence to the Atrial Fibrillation Better Care (ABC) pathway resulted in a 58% reduction in all-cause death risk, 63% reduction in cardiovascular disease risk, and 45% reduction in ischemic stroke risk. Investigating the adherence to ABC pathway management and identifying gaps between the real world and established guidelines can lead to better integrated management. The review by Romiti et al[6] showed that only 21% AF patients adhered to ABC pathway management. And there was great heterogeneity among different regions and subjects.

The level of adherence to ABC pathway management in elderly AF patients may be very low. Elderly AF patients are frailer, have more comorbidities, and take more drugs.[7] In China, 73.2% of elderly patients with atrial fibrillation have two or more comorbidities.[8] Multimorbidity make the integral management of AF in elderly patients more difficult.[8] In addition, social support for the elderly is relatively insufficient due to retirement and widowed.[9,10] Therefore, more attention should be paid to the adherence to ABC pathway management in elderly AF patients.

To date, only two cohort studies in China have investigated the adherence to ABC pathway management in AF patients.[8,11] Wang et al[11] conducted the Chinese Atrial Fibrillation registry (CAFR) study which enrolled AF patients >18 years of age, and the adherence in elderly AF patients was unclear. Kotalczyk et al[8] conducted the Optimal Thromboprophylaxis in Elderly Chinese Patients With Atrial Fibrillation (ChiOTEAF) study in AF patients aged ≥65 years. However, of the 42 sites in the study, 40 were tertiary-level hospitals and 2 were secondary-level hospitals.[12] And 71.7% of the subjects were follow-up patients after hospitalization.[12]

There are likely more AF patients in the community who are not being managed. A study showed that while 60% of hospitalized AF patients were treated with anticoagulant therapy, only 25% continued treatment after discharge.[13] In addition, 50–87% of AF patients are asymptomatic and patients often wait to seek medical attention until they have obvious symptoms.[1,14]

To our knowledge, there are no related studies on elderly community patients with AF in China. The adherence to ABC pathway management of elderly community patients with AF in China remains unclear. The current study aimed to investigate the adherence to ABC pathway management among elderly community patients with AF in China, so as to better integrate AF management into community settings and improve health outcomes and quality of life for these patients.

Methods
Design and Study Population

This is a cross-sectional study. Health examination data from 2020 was collected from the National Basic Public Health Service Program database for all residents of Yuexiu, Guangzhou, Guangdong Province who were >65 years of age. Cluster sampling was used by the program and all community hospitals in Yuexiu District were included in the study. Community hospitals send notices about health exam programs to residents in their districts who are >65 years of age based on the National Medical registration system. Those who are unable to reach a community hospital can make appointments with a primary care physician for an in-home health exam. From 54,845 residents aged >65 years, a total of 709 AF patients met the inclusion criteria of (1) a 12-lead, digital electrocardiogram (ECG) reporting an AF pattern or (2) a report of AF on previous ECG or medical records. It included 197 patients with a previous diagnosis and 512 with first diagnosis in from a current physical examination. Given that first-diagnosed patients may not have started treatment, the 197 previously-diagnosed patients were considered for the adherence analysis (Figure 1). The study complied with the
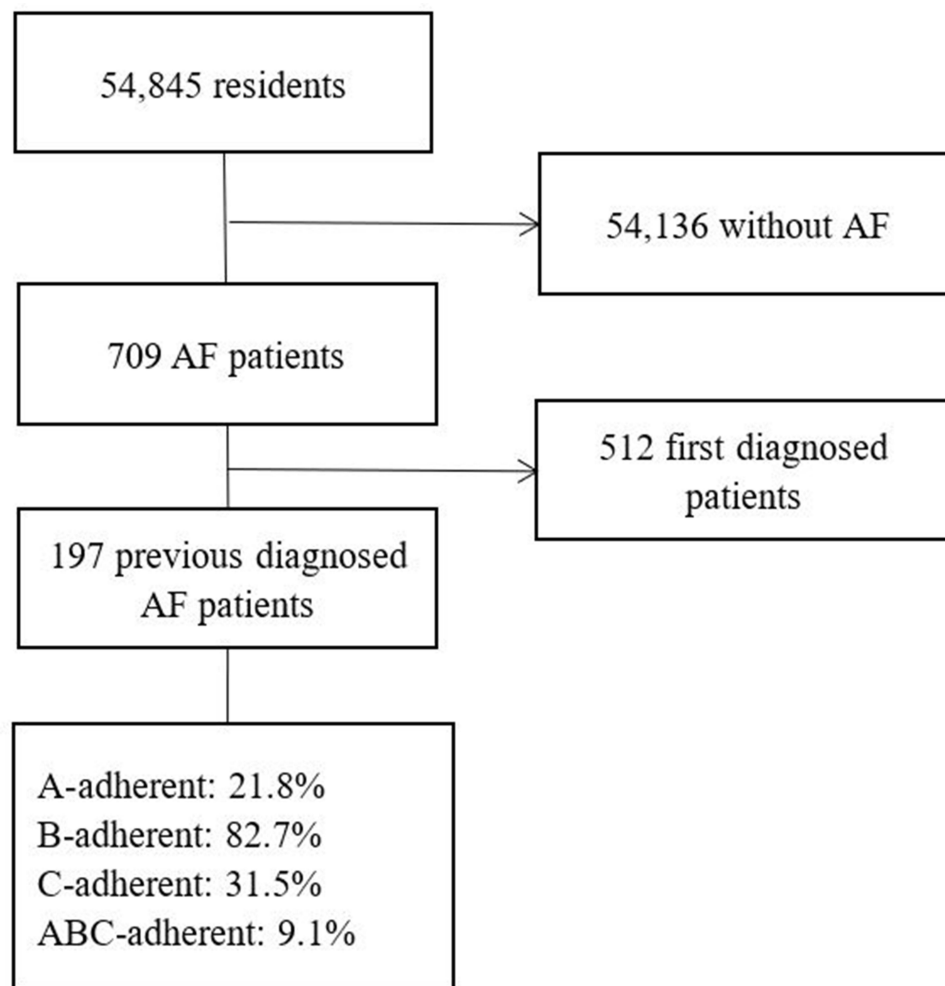
Figure 1 Flow chart of AF patients' selection.

Declaration of Helsinki and was approved by the Ethics Committee of Guangdong Provincial People's Hospital, China (Approval number: KY-Z-2020-632-02).

Data Collection and Measurement

1. Demographic information completed by AF patients, including age, sex, educational level, marital status, and medical insurance;
2. Disease information obtained by the physician based on medical history and health records, including history of cardiovascular and other comorbidities, CHA_2DS_2-VASc score, HAS-BLED score, AF-related symptoms, medications, and surgery records. CHA_2DS_2-VASc [congestive heart failure, hypertension, aged ≥75 years (doubled), diabetes mellitus, history of stroke (doubled), vascular disease, aged 65–74 years, and sex (female)] score was calculated to estimate the stroke risk for AF patients.[1] HAS-BLED [hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalized ratio, elderly (aged >65 years), drugs/alcohol concomitantly] was calculated to predict the bleeding risk of AF patients on anticoagulants.[1] AF-related symptoms included dizziness, fatigue, chest pain, chest tightness, palpitations, and dyspnoea. Multimorbidity was defined as the presence of two or more diseases (in addition to AF) including hypertension, diabetes, dyslipidaemia, HF, CAD, stroke/TIA, and PAD.[15] Polypharmacy was defined as the use of ≥5 drugs.[16]
3. Physical exams were completed by the physician. Hypertension was defined as a systolic blood pressure (SBP) ≥140 mmHg and/or diastolic blood pressure (DBP) ≥90 mmHg and/or a previous diagnosis of hypertension with

the use of antihypertensive medication.[17] Body mass index (BMI) was expressed as weight (kg) / height^2 (m).[18] Diabetes was defined as fasting blood glucose (FBG) ≥7.0 mmol/L and/or a previous diagnosis of diabetes with use of insulin or hypoglycaemic agents.[18] Dyslipidemia was defined as total cholesterol (TC) ≥6.2 mmol/L, triglycerides (TG) ≥2.3 mmol/L, low-density lipoprotein cholesterol (LDL-C) ≥4.1 mmol/L, and high-density lipoprotein cholesterol (HDL-C) <1.0 mmol/L and/or a previous diagnosis of dyslipidemia with use of lipid-lowering drugs.[18] AF was diagnosed by Standard 12-lead digital ECG.

Assessment of Adherence to the ABC Pathway

Based on the 2020 ESC guidelines, adherence to the ABC pathway management was defined as follows:[1]

"A-adherent"—Patients were considered to meet this criterion if they received appropriate anticoagulants based on the CHA$_2$DS$_2$-VASc score. Male patients with CHA$_2$DS$_2$-VASc≥2 and female patients with CHA$_2$DS$_2$-VASc≥3 who received oral anticoagulants (OAC), including warfarin with a time in therapeutic range (TTR >70%) or non-vitamin K antagonist oral anticoagulant (NOAC); male patients with CHA$_2$DS$_2$-VASc=1 and female patients with CHA$_2$DS$_2$-VASc=2 who received or did not receive OAC; and male patients with CHA$_2$DS$_2$-VASc=0 and female patients with CHA$_2$DS$_2$-VASc=0 or 1 who did not receive OAC were considered to meet this criterion.

"B-adherent"—Patients self-reported no AF-related symptoms.

"C-adherent"—Cardiovascular disease and comorbidities associated with AF were treated with specific medications or met the treatment criteria. (1) For hypertension, blood pressure ≤140/90 mmHg was considered well controlled.[17] (2) For HF, angiotensin-converting enzyme inhibitors (ACEI)/angiotensin receptor blockers (ARB) and β-blockers were used.[18] (3) For CAD, ACEI/ARB, β-blockers, and lipid-lowering drugs (LLD) were used.[18] (4) PAD treated with LLD.[18] (5) Stroke/TIA treated with LLD. (6) Dyslipidaemia treated with LLD.[18] (7) For diabetes, insulin or oral hypoglycaemic drugs were used.[18] (8) BMI<28.0 kg/m^2.[18] When all of these diseases were well controlled or properly medicated, it was defined as adherence to C pathway management.

"ABC-adherent"—If all three components met the criteria, the patient was identified as adherent to the ABC pathway management.

Statistical Analysis

All data were analyzed using IBM SPSS Statistics version 25.0 (SPSS Inc., Chicago, IL, USA). Basic characteristics and the adherence to ABC pathway management were evaluated by descriptive statistics. A Chi-square test was used to compare differences in adherence to ABC pathway management using different demographic and clinical data. All statistical tests were two-sided. Variables with statistical significance in the chi-square test were included in the multi-variate logistic regression model to determine the independent factors associated with the non-adherence to the ABC pathway after adjusting for sex. P <0.05 was considered statistically significant.

Results
Basic Characteristics of the Study Participants

Sociodemographic and clinical information is shown in Table 1. Among the 197 patients with AF, 52.3% were male, 59.4% were ≥75 years of age, 64.5% had a senior middle school education or above. The most common comorbidities were hypertension (72.1%), CAD (28.9%), dyslipidaemia (28.4%) and diabetes (24.9%). Stroke or TIA occurred in 13.7% of AF patients. Based on the CHA$_2$DS$_2$-VASc and HAS-BLED Scores, 88.3% (174/197) participants were strongly recommended to take oral anticoagulants, and 12.2% (17/197) had a high risk of bleeding. For comorbidities and treatment, 84.8% (167/197) AF patients had ≥2 cardiovascular, and 6.1% (12/197) AF patients took ≥5 medications.

Adherence to the ABC Pathway Management and Its Components in Patients with AF

Table 2 shows the ABC pathway management data of AF patients. Regarding the ABC pathway, very few patients (9.1%) met all the criteria. Regarding "A", avoid stroke or anticoagulation, only 21.8% (43/197) AF patients were in the A-adherent group. Among them, 11.2% (22/197) received OAC, including 4.1% (8/197) who received warfarin and 7.1%

Table 1 Sociodemographic and Clinical Characteristics of the AF Patients

	Frequency	Percentage (%)
Demographic, n (%)		
Sex		
Female	94	47.7
Male	103	52.3
Age		
65–74 years	80	40.6
≥75 years	117	59.4
Educational level		
Junior middle school or below	70	35.5
Senior middle school or above	127	64.5
Marital status		
Married	166	84.3
Divorced/ Widowed/Single	31	15.7
Medical insurance		
Free medical care	11	5.6
Urban employee medical insurance	173	87.8
Other medical insurance	11	5.6
No	2	1.0
Disease course, n (%)		
<1 year	26	13.2
≥1 year	171	86.8
Stroke or bleeding risk scores, n (%)		
CHA_2DS_2-VASc		
Score ≤1 (male); Score ≤2 (female)	23	11.7
Score ≥2 (male); Score ≥3 (female)	174	88.3
HAS-BLED		
Score ≤2	122	87.8
Score ≥3	17	12.2
Comorbidities, n (%)		
Multimorbidity	167	84.8
Hypertension	142	72.1
Diabetes	49	24.9
Dyslipidaemia	56	28.4
CAD	57	28.9
HF	9	4.6
Stroke/TIA	27	13.7
PAD	5	2.5
BMI ≥28 kg/m2	21	11.5
Concomitant treatment, n (%)		
Polypharmacy	12	6.1
Anticoagulants	22	11.2
Warfarin	8	4.1
NOAC	14	7.1
Rhythm or heart rate control drugs	76	38.6
β-blocker	73	37.1
Amiodarone	4	2.0
Digoxin	3	1.5
Antiplatelet drugs	23	11.7
ACEI	9	4.6
ARB	60	30.5
CCB	76	38.6

(*Continued*)

Table 1 (Continued).

	Frequency	Percentage (%)
Diuresis	20	10.2
Insulin/oral antidiabetic drugs	38	19.3
LLD	40	20.3
RFCA	46	23.4

Abbreviations: ACEI, angiotensin-converting-enzyme inhibitor; AF, atrial fibrillation; ARB, angiotensin receptor blockers; BMI, body mass index; CAD, coronary artery disease; CCB, calcium channel blocker; CHA_2DS_2-VASc, congestive heart failure, hypertension, age ≥75 years, diabetes, stroke/transient ischemic attack, vascular disease, age 65–74 years, sex category; HAS-BLED, hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalised ratio, elderly (>65 years), drugs or alcohol concomitantly; HF, heart failure; LLD, lipid-lowering drug; NOAC, non-vitamin K antagonist oral anticoagulant; PAD, peripheral arterial disease; RFCA, radiofrequency catheter ablation; TIA, transient ischemic attack.

(14/197) who received NOAC (Table 1). Regarding "B", better symptom control, 82.7% (163/197) AF patients were in the B-adherent group. Among them, 32.0% (76/197) received medications for arrhythmia or heart rate control, 23.4% (46/197) received radiofrequency catheter ablation (RFCA). Regarding "C", cardiovascular and other comorbidity management, 31.5% (62/197) patients were in the C-adherent group. For the C component, the level of adherence to hypertension (65.6%), diabetes (77.6%), and BMI (88.5%) was relatively higher, and the level of adherence to HF (22.2%), CAD (1.8%), stroke/TIA (22.2%), and dyslipidaemia (38.9%) was lower.

Differences in the Adherence to ABC Pathway Management by Demographic and Clinical Characteristics

Table 3 shows that AF patients who adhered to the ABC pathway management were more likely to be 65–74 years of age (P<0.001), without multimorbidity (P<0.001), and CHA_2DS_2-VASc Score≤1 (male)/≤2 (female) (P<0.001). AF patients in the A-adherent group were more likely to be 65–74 years of age (P<0.001), disease course<1 year (P=0.028), without multimorbidity (P<0.001), and CHA_2DS_2-VASc score≤1 (male)/≤2 (female) (P<0.001). AF patients in the B-adherent group were more likely to have a disease course ≥1 year (P=0.002). AF patients in the C-adherent group were more likely to be without multimorbidity (P<0.001), and CHA_2DS_2-VASc score≤1 (male)/≤2 (female) (P<0.001).

Table 2 Adherence to ABC Pathway Management and Its Components Among AF Patients

	Adherence N (%)	Non-Adherence N (%)
A pathway	43 (21.8)	154 (78.2)
B pathway	163 (82.7)	34 (17.3)
C pathway	62 (31.5)	135 (68.5)
Hypertension	86 (65.6)	45 (34.4)
HF	2 (22.2)	7 (77.8)
CAD	1 (1.8)	56 (98.2)
Dyslipidaemia	12 (38.9)	44 (61.1)
Stroke/TIA	6 (22.2)	21 (77.8)
Diabetes	38 (77.6)	11 (22.4)
PAD	3 (60.0)	2 (40.0)
BMI kg/m^2	162 (88.5)	21 (11.5)
All ABC pathway	18 (9.1)	177 (90.9)

Abbreviations: AF, atrial fibrillation; CAD, coronary artery disease; HF, heart failure; TIA, transient ischemic attack; PAD, peripheral arterial disease; BMI, body mass index.

Table 3 Adherence to ABC Pathway Management According to the Sociodemographic and Clinical Characteristics of AF Patients

	A Component (n= 43)		B Component (n= 163)		C Component (n= 62)		ABC Pathway (n= 18)	
	Adherence	Non-Adherence	Adherence	Non-Adherence	Adherence	Non-Adherence	Adherence	Non-Adherence
Sex, n (%)								
Female	23 (24.5)	71 (75.5)	74 (78.7)	20 (21.3)	27 (28.7)	67 (71.3)	6 (6.4)	88 (93.6)
Male	20 (19.4)	83 (80.6)	89 (86.4)	14 (13.6)	35 (34.0)	68 (66.0)	12 (11.7)	91 (88.3)
χ^2 (P)	0.735 (0.391)		2.032 (0.154)		0.630 (0.427)		1.643 (0.200)	
Age, n (%)								
65–74 years	32 (40.0)	48 (60.0)	69 (86.3)	11 (13.8)	31 (38.8)	49 (61.3)	15 (18.8)	65 (81.3)
≥75 years	11 (9.4)	106 (90.6)	94 (80.3)	23 (19.7)	31 (26.5)	86 (73.5)	3 (2.6)	114 (97.4)
χ^2 (P)	26.070 (<0.001)*		1.161 (0.281)		3.308 (0.069)		13.107 (<0.001)*	
Marital status, n (%)								
Married	37 (22.3)	129 (77.7)	138 (83.1)	28 (16.9)	55 (33.1)	111 (66.9)	16 (9.6)	150 (90.4)
Divorced/Widowed/Single	6 (19.4)	25 (80.6)	25 (80.6)	6 (19.4)	7 (22.6)	24 (77.4)	2 (6.5)	29 (93.5)
χ^2 (P)	0.132 (0.717)		0.113 (0.737)		1.349 (0.246)		0.320 (0.572)	
Academic level, n (%)								
Junior middle school or below	18 (25.7)	52 (74.3)	58 (82.9)	12 (17.1)	22 (31.4)	48 (68.6)	8 (11.4)	62 (88.6)
Senior middle school or above	25 (19.7)	102 (80.3)	105 (82.7)	22 (17.3)	40 (31.5)	87 (68.5)	10 (9.7)	117 (92.1)
χ^2 (P)	0.961 (0.327)		0.001 (0.974)		0.001 (0.992)		0.687 (0.407)	
Disease course, n (%)								
<1 year	10 (38.5)	16 (61.5)	16 (61.5)	10 (38.5)	10 (38.5)	16 (61.5)	2 (7.7)	24 (92.4)
≥1 year	33 (19.3)	138 (80.7)	147 (86.0)	24 (14.0)	52 (30.4)	119 (69.6)	16 (9.4)	155 (90.6)
χ^2 (P)	4.857 (0.028)*		9.430 (0.002)*		0.678 (0.410)		<0.001 (1.000)	
Polypharmacy, n (%)								
Yes	0 (0.0)	12 (100.0)	10 (83.3)	2 (16.7)	2 (16.7)	10 (83.3)	0 (0.0)	12 (100.0)
No	43 (23.2)	142 (76.8)	153 (82.7)	32 (17.3)	60 (32.4)	125 (67.6)	18 (9.7)	167 (90.3)
χ^2 (P)	— (0.072)		<0.001 (1.000)		0.671 (0.431)		— (0.607)	
Multimorbidity, n (%)								
Yes	20 (12.0)	147 (88.0)	137 (82.0)	30 (18.0)	40 (24.0)	127 (76.0)	3 (1.8)	164 (98.2)
No	23 (76.7)	7 (23.3)	26 (86.7)	4 (13.3)	22 (73.3)	8 (26.7)	15 (50.0)	15 (50.0)
χ^2 (P)	62.373 (<0.001)*		0.126 (0.722)		28.754 (< 0.001)*		65.489 (<0.001)*	
CHA$_2$DS$_2$-VASc Score, n (%)								
≤1 (male); ≤2 (female)	23 (100.0)	0 (0.0)	20 (87.0)	3 (13.0)	15 (65.2)	8 (34.8)	13 (56.5)	10 (43.5)
≥2 (male); ≥3 (female)	20 (11.5)	154 (88.5)	143 (82.2)	31 (17.8)	47 (27.0)	127 (73.0)	5 (2.9)	169 (97.1)
χ^2 (P)	— (<0.001)*		0.076 (0.783)		13.749 (<0.001)*		70.425 (<0.001)*	
HAS-BLED Score, n (%)								
≤2	34 (27.9)	88 (72.1)	97 (79.5)	25 (20.5)	36 (29.5)	86 (70.5)	13 (10.7)	109 (89.3)
≥3	5 (29.4)	12 (70.6)	12 (70.6)	5 (29.4)	2 (11.8)	15 (88.2)	1 (5.9)	16 (94.1)
χ^2 (P)	0.018 (0.894)		0.701 (0.402)		1.556 (0.212)		0.033 (0.855)	

Note: *p-value <0.05.
Abbreviations: AF, atrial fibrillation; CHA$_2$DS$_2$-VASc, congestive heart failure, hypertension, age ≥75 years, diabetes, stroke/transient ischemic attack, vascular disease, age 65–74 years, sex category; HAS-BLED, hypertension, abnormal renal/liver function, stroke, bleeding history or predisposition, labile international normalised ratio, elderly (>65 years), drugs or alcohol concomitantly.

Factors Independently Associated with the Non-Adherence to the ABC Pathway Management

Multivariate logistic regression analyses showed that sex-adjusted factors independently associated with the non-adherence to the ABC pathway management included aged ≥75 years (compared with aged 65–74 years, OR=4.665, 95% CI: 1.072–20.291, P=0.040), and multimorbidity (OR=45.891, 95% CI: 11.112–189.528, P<0.001). The factor independently associated with non-adherence to the "A" component management was aged ≥75 years (compared with aged 65–74 years, OR=5.776, 95% CI: 2.331–14.310, P<0.001) and multimorbidity (OR=21.179, 95% CI: 7.433–0.348, P<0.001). The factor independently associated with non-adherence to the "B" component management was disease course <1 year (compared with disease course ≥1 year, OR=0.253, 95% CI: 0.102–0.629, P=0.003). The factor independently associated with non-adherence to the "C" component management was multimorbidity (OR=8.780, 95% CI: 3.620–21.297, P<0.001) (Table 4).

Discussion

There were three main findings: (1) The level of adherence to ABC pathway management among the elderly community patients with AF was low (9.1%); (2) There were very few AF patients in the A-adherent group (21.8%), followed by the C-adherent group (31.5%), but relatively more in the B-adherent group (84.8%); (3) Aged ≥75 years and multimorbidity independently associated with non-adherence to the ABC pathway management and non-adherence to the "A" component management. Disease course ≥1 year independently associated with adherence to the "B" component management. Multimorbidity independently associated with non-adherence to the "C" component management.

Adherence to the ABC pathway management was extremely low among elderly community patients with AF, with only 9.1% of patients meeting the criteria, which was much lower than in other studies.[6] The ChiOTEAF study by Kotalczyk et al[8] in China found that 43.3% and 51.7% of elderly patients with AF in polypharmacy or multimorbidity group adhered to ABC pathway management. It can be seen that the adherence to ABC pathway management in community patients with AF was much worse than in inpatients with AF.[8]

On the one hand, it may be because community AF patients receive less health education and have less knowledge of disease management than inpatients.[19] In this study, 84.8% of participants had two or more comorbidities, and 15.7% were divorced, widowed, or single. Frailty, comorbidity, and insufficient social support make self-management of elderly AF patients more difficult.[7,9,10] On the other hand, it may be because primary physicians have insufficient knowledge of AF management.[20] In addition, as of the time of data collection in this study, AF was not included in the resident basic

Table 4 Sex-Adjusted Factors Independently Associated with Non-Adherence to the ABC Pathway Management Among AF Patients

	β	S.E	Wald χ^2	OR	95% CI		p-value
A component							
Age (years)							
65–74				1.000			
≥75	1.754	0.463	14.353	5.776	2.331	14.310	<0.001*
Multimorbidity	3.053	0.534	32.656	21.179	7.433	60.348	<0.001*
B component							
Disease course (<1 year)				1.000			
Disease course (≥1 year)	−1.374	0.465	8.739	0.253	0.102	0.629	0.003*
C component							
Multimorbidity	2.173	0.452	23.095	8.780	3.620	21.297	<0.001*
ABC pathway							
Age (years)							
65–74				1.000			
≥75	1.540	0.750	4.216	4.665	1.072	20.291	0.040*
Multimorbidity	3.826	0.724	27.960	45.891	11.112	189.528	<0.001*

Note: *p-value <0.05.

health service assessment program and NOAC was not included in the health insurance reimbursement program. The combination of these factors hinders the management of AF in the community.

Regarding "A", avoid stroke or anticoagulation, this study found that the only 21.8% participants were in the A-adherent group. Proietti et al's and Pastori et al's[21,22] study of AF patients >65 years of age in Europe and North America showed that 61.8% and 46.3% patients were in the A-adherent group, respectively. There was still a gap in anticoagulant management of elderly AF patients between China and Europe and North American countries. In this study, 88.3% (167/197) participants were strongly recommended OACs according to the guidelines.[1] However, only 11.2% of the patients were taking OACs. According to a study by Wei et al,[23] only 3.8% of AF patients refused anticoagulant therapy after they were fully informed about the risk of stroke. This is likely because most (82.7%) AF patients in the current study were asymptomatic and did not seek medical attention.

In this study, few community AF patients used NOAC. The 2020 ESC guidelines indicate that NOAC has comparable safety and efficacy to warfarin, is easy to use, and has strong patient adherence.[1] Although the use of NOAC has reached 75.8% in Europe,[24] only 7.1% (14/197) of AF patients in this study received this treatment. It may be that by the time of this study, NOAC had not yet been included in the national medical insurance. And the average cost of NOAC was about $160 to $191 per month at the time of this study,[25] which is nearly half of an individual's average monthly disposable income. To solve this issue, NOAC were included in China's National Medical Insurance Program in 2022, with prices similar to warfarin. In the future, it will be more convenient for community AF patients to use anticoagulant drugs.

Regarding "B", better symptom control, it was satisfactory in this study. Most AF patients had no AF-related symptoms (82.7%). The findings were consistent with Yang et al's[26] study in 262,987 Asian AF patients (82.6%). About symptom management strategies, rate/rhythm control medications were used in 38.6% AF patients, and only 23.4% patients received RFCA. This is likely because the majority (50%–87%) of AF patients are asymptomatic and because a single radiofrequency ablation has a high recurrence rate of AF.[27] Thus, radiofrequency ablation was not a priority for most AF patients in this study.

Regarding "C", cardiovascular and other comorbidity management, only 31.5% AF patients were in the C-adherent group, which was quite different from the results of Proietti et al[28] in their global multi-centre study of AF patients aged >65 years. This may be mainly because their study considered fewer comorbidities, and they did not include diabetes, dyslipidaemia, or BMI in the evaluation criteria of C-adherent.[28] A study investigating clinically complex patients with AF demonstrated that AF patients with multimorbidity have worse management adherence.[29]

Hypertension and diabetes are better managed in community patients with AF compared with other comorbidities. It may be because hypertension and diabetes were the most common chronic diseases and were included in the evaluation of chronic disease management efforts by primary care physicians. Dyslipidaemia often neglected by AF patients. Only 38.9% of AF patients in this study met the management criteria. A survey in northern China also found that few (14.7%) of people knew they had dyslipidaemia, and very few of them received treatment.[30] Higher TG and HDL-C levels were associated with ischemic stroke in AF patients.[31] Closer attention should be paid to dyslipidaemia during the management of chronic diseases in primary hospitals. Management of HF and CAD was extremely poor, with only 22.2% and 1.8% of AF patients meeting the management criteria, respectively. Kotalczyk et al[8] study of elderly Chinese patients with AF also found that HF and CAD were the main factors for non-adherence to comorbidity management. In this study, 22.2% of AF patients met the criteria for stroke/TIA management. It can be seen that AF patients have poor cognition of stroke prevention, which is also the main reason why few participants were in the A-adherent group in this study.

About factors independently associated with adherence to the ABC pathway. This is likely because, elderly AF patients have more comorbidities, which makes the management of "C" component more difficult and thus, their adherence to ABC pathway management is worse. Similarly, the more comorbidities they have, the higher the CHA_2DS_2-VASc score, and more patients must then receive OAC. This also resulted in few AF patients in the A-adherent group in this study. As the disease course progresses, patients may become more aware of AF and initiate symptom management strategies. Therefore, patients with disease duration ≥1 year had relatively better symptom management. Gumprecht et al[32] also found consistent results in their investigation of AF patients in the Middle East. In the future, elderly community patients with AF should be the targeted population for integrated management of AF, with a focus on anticoagulation therapy and comorbidities management.

Limitations

First, all participants were community residents in this study. Thus, this study can only represent AF patients in Chinese communities, not all AF patients. Second, only 197 previously diagnosed AF patients were included in the cross-sectional survey. In the future, prospective studies with larger samples are needed to further explore the influencing factors for adherence to ABC pathway management among elderly community patients with AF. Finally, The data of the study were from the National Basic Public Health Service Program database. These patients who participated in physical examination and cooperated with data collection may be relatively active in AF management. In fact, the level of adherence to ABC pathway management in community elderly patients with AF may be lower than in the study.

Conclusions

This study investigated the adherence to ABC pathway management among elderly community patients with AF in China. Many gaps were found between the ABC pathway management of AF and the 2020 ESC guidelines. Additional studies should explore effective methods to improve ABC pathway management among elderly community patients with AF.

Data Sharing Statement

The data underlying this article will be shared on reasonable request to the corresponding author.

Disclosure

The authors report no conflicts of interest in this work.

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