Original article

Effect of oral anti-coagulant on 12-month overall mortality rate in admitted elderly patient with newly diagnosed atrial fibrillation and atrial flutter

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Abstract:

Background: *Atrial fibrillation increases the risk of ischemic stroke, contributing to increased disability and mortality. Nevertheless, the benefit of early initiation of oral anticoagulant (OAC) for stroke prevention in elderly with newly diagnosed atrial fibrillation (AF) during hospitalization for non-cardiac causes remains questionable.* ***Objective:*** *To study the effect of OAC on the 12-month overall mortality rate in admitted elderly patient with newly diagnosed atrial fibrillation and atrial flutter* ***Methods:*** *We conducted a retrospective cohort study involving hospitalized patients with non-cardiac causes at Siriraj Hospital in Thailand between 2003-2019. Participants aged more than 75 years and newly diagnosed AF were included. The primary outcome was overall mortality. Secondary outcomes were cardiovascular death, non-cardiovascular death, non-fatal stroke, bleeding events, and rehospitalization.* ***Results:*** *We enrolled a total of 216 participants, with 24 in the OAC group and 192 in the non-OAC group. The predominant OAC used was warfarin (91.7%). Throughout the 1-year follow-up period, 6 deaths were observed in the OAC group, compared to 107 deaths in the non-OAC group. The hazard ratio (HR) for overall mortality was 0.33 [95% confidence interval (CI), 0.15-0.75; p-value = 0.08]. Post-hoc power was 84% with an alpha of 0.05. However, non-cardiovascular deaths accounted for 96.4% of all deaths. There were 4 non-fatal strokes only in the non-OAC group. The HR for bleeding events was 6.11 (95%CI, 1.37-27.32; p-value = 0.018).* ***Conclusions:*** *Non-cardiovascular death emerged as the primarily cause of death. The potential benefits of initiating OAC in elderly patients newly diagnosed with AF during hospitalization might be constrained by patients' active medical conditions. Nevertheless, the consideration of stroke prevention post-hospitalization in elderly remains warranted. Further prospective studies are required to determine the optimal timing for initiating OAC therapy, mainly warfarin to maximize the benefit of stroke prevention while minimizing bleeding risks.*

Keywords: ● *Stroke prevention in atrial fibrillation* ● *SPAF* ● *Newly diagnosed atrial fibrillation* ● *Newly diagnosed AF* ● *Elderly*

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นิพนธ์ต้นฉบับ

การศึกษาเปรียบเทียบอัตราการเสียชีวิตที่ 12 เดือนของผู้ป่วยที่มีอายุตั้งแต่ 75 ปีที่นอนอยู่ในโรงพยาบาลที่ได้รับการวินิจฉัยภาวะหัวใจห้องบนสั่นพลิ้วครั้งแรกในกลุ่มที่กินยาละลายลิ่มเลือดกับกลุ่มที่ไม่กินยาละลายลิ่มเลือด

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บทคัดย่อ

ที่มาและความสำคัญ *ภาวะหัวใจห้องบนสั่นพลิ้วครั้งแรกเพิ่มความเสี่ยงในการเกิดโรคหลอดเลือดสมองซึ่งทำให้เกิดทุพพลภาพและอัตราการเสียชีวิตที่เพิ่มขึ้น ถึงกระนั้นประโยชน์ของการเริ่มยาละลายลิ่มเลือดเร็วตั้งแต่ช่วงนอนอยู่ในโรงพยาบาลเพื่อป้องกันโรคหลอดเลือดสมองในผู้สูงอายุที่เข้ารับการรักษาในโรงพยาบาลด้วยสาเหตุอื่นที่ไม่ใช่จากโรคหัวใจยังเป็นที่ถกเถียงกันในปัจจุบัน* ***วัตถุประสงค์*** *เพื่อศึกษาผลของยาละลายลิ่มเลือดต่ออัตราการเสียชีวิตที่ 12 เดือนในผู้ป่วยที่มีอายุตั้งแต่ 75 ปีที่เข้ารับการรักษาในโรงพยาบาลและได้รับการวินิจฉัยภาวะหัวใจห้องบนสั่นพลิ้วครั้งแรก* ***วิธีดำเนินการ*** *ศึกษาแบบ retrospective cohort study ในผู้ป่วยอายุตั้งแต่ 75 ปีขึ้นไปที่ได้เข้ารับการรักษาในโรงพยาบาลศิริราชด้วยสาเหตุอื่นที่ไม่ใช่จากโรคหัวใจตั้งแต่ปี พ.ศ. 25462562-* ***ผลการวิจัย*** *มีผู้ป่วยทั้งหมด 216 ราย ประกอบด้วย 24 รายในกลุ่มที่ได้รับยาละลายลิ่มเลือด และ 192 รายที่ไม่ได้รับยาละลายลิ่มเลือด ยาละลายลิ่มเลือดที่ผู้ป่วยได้รับส่วนใหญ่เป็น warfarin (91.7%) Hazard ratio ของอัตราการเสียชีวิตที่ 12 เดือนเป็น 0.33 (95% confidence interval 0.150.75-; p-value 0.08) คำนวณ post-hoc power ได้ 84% ที่ alpha 0.05 อย่างไรก็ตามผู้ป่วยส่วนใหญ่ (96.4%) เสียชีวิตจากสาเหตุอื่นที่ไม่ใช่โรคหัวใจ* ***สรุป*** *ผู้ป่วยที่สูงอายุที่เข้ารับการรักษาในโรงพยาบาลและได้รับการวินิจฉัยภาวะหัวใจห้องบนสั่นพลิ้วครั้งแรกเสียชีวิตจากสาเหตุอื่นที่ไม่ใช่โรคหัวใจเป็นสาเหตุหลัก การเริ่มยาละลายลิ่มเลือดในผู้ป่วยกลุ่มดังกล่าวถูกจำกัดด้วยโรคหรือโรคประจำตัวของผู้ป่วยเอง แต่ถึงอย่างไรก็ตามการตระหนักถึงการให้ยาละลายลิ่มเลือดเพื่อป้องกันโรคหลอดเลือดสมองยังมีความจำเป็น การศึกษาเพิ่มเติมแบบ prospective study จึงเป็นส่วนสำคัญที่ช่วยบอกถึงช่วงเวลาที่เหมาะสมในการเริ่มยาละลายลิ่มเลือด โดยเฉพาะ warfarin เพื่อให้เกิดประโยชน์สูงสุดในการป้องกันโรคหลอดเลือดสมองและลดโอกาสการเกิดภาวะเลือดออก*

คำสำคัญ: ● *การป้องกันโรคหลอดเลือดสมองในภาวะหัวใจห้องบนสั่นพลิ้ว* ● *ภาวะหัวใจห้องบนสั่นพลิ้วครั้งแรก*
● *การป้องกันโรคหลอดเลือดสมองในภาวะหัวใจห้องบนสั่นพลิ้วในผู้สูงอายุ*

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ได้รับต้นฉบับ 26 มีนาคม 2567 แก้ไขบทความ 26 มิถุนายน 2567 รับลงตีพิมพ์ 30 มิถุนายน 2567

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Introduction

Atrial fibrillation (AF) is a frequent cardiac arrhythmia, particularly among the elderly. In Thailand, the prevalence of AF is 1.6% in individuals aged between 65 and 74 years and increases to 2.5% in those aged 75 years and older[2]. AF elevates the risk of ischemic stroke and major adverse cardiac event (MACE) leading to disability and mortality[3,4]. Recent guidelines recommend the assessment of stroke risk using the CHA_2DS_2-VASc score and bleeding risk using the HAS-BLED score[5,6]. However, the bleeding risk in elderly patients is often higher than expected based solely on the HAS-BLED score, due to factors such as clinical frailty[7,8], drug-drug interaction from polypharmacy[9,10], and malnutrition[11,12]. Furthermore, warfarin remains the primary oral anticoagulant (OAC) used in Thailand. Drug-food interaction must also be considered, as it can result in a labile INR, leading to unfavorable outcomes. The initiation of OAC therapy in elderly patients newly diagnosed with AF requires a collaborative decision-making process involving the attending physician, the patient's preferences, and the patient's family. Therefore, a retrospective cohort study was conducted to investigate whether initiating OAC in elderly patients newly diagnosed with AF or atrial flutter could reduce overall mortality within a 12-month period.

Material and methods

Study design

The retrospective cohort study was conducted with hospitalized patients with non-cardiac causes at Siriraj Hospital in Thailand from January 2003 to 2019. Participants were identified using ICD-10 codes (I48.0, I48.4, I48.9, I48.91, I48.92 for newly diagnosed AF and atrial flutter). This study received an approval from the Institutional Review Board, Faculty of Medicine, Siriraj Hospital (SIRB) (COA no. 225/2019).

Study population

Hospitalized participants aged 75 years or older, with newly diagnosed AF or atrial flutter, were included. Participants were excluded if they were admitted due to any cardiovascular events [e.g., myocardial infarction (MI), ischemic stroke] or had undergone cardiovascular surgeries. Participants with a history of OAC use or a prior diagnosis of AF or atrial flutter were deemed ineligible. Additionally, individuals with mitral stenosis, hypertrophic cardiomyopathy, or prosthetic heart valves were excluded. The participants were categorized into 2 groups: the OAC group, comprising those initiated with OAC during the index hospitalization, and the non-OAC group, consisting of those not initiated with OAC during the index hospitalization. The participants were then observed for a period of 1 year.

Outcomes

The primary outcome was 12-month overall mortality, while secondary outcomes included cardiovascular death, non-cardiovascular death, non-fatal stroke, bleeding events, and rehospitalization.

Statistical analysis

In the sample size calculation for the primary outcome, a hazard ratio of 0.49 was used[13], aiming for a power of 90% at an alpha level of 5%. This calculation yielded the required sample size of 173 participants in each group. The sample size calculation was performed in the nQuery sample size

software. The hazard ratio (HR) for overall mortality was analyzed using the Cox proportional-hazards model with proportional hazards assumption. Variables demonstrating a relationship with overall mortality in the univariate analysis (*p*-value < 0.2) were subsequently incorporated into the multivariate analysis to define the independent predictor of 12-month overall mortality. Likewise, the secondary outcomes were analyzed using the Cox proportional-hazards model with proportional hazards assumption. The statistical analysis was conducted using Stata software version 15.1. Two-sided *p*-values less than 0.05 were considered indicative of statistical significance.

Results

Study population

After applying the ICD-10 codes as mentioned earlier, a total of 4,704 participants were eligible for assessment. Among them, 216 participants with newly diagnosed AF and atrial flutter were included in this study: 24 (11.1%) in the OAC group and 192 (88.9%) in the non-OAC group. The baseline characteristics of participants are described in Table 1. OAC use comprised 22 cases of warfarin (91.7%), 1 case of apixaban (4.2%), and 1 case of dabigatran (4.2%). The mean age was 81.9±4.2 years in the OAC group and 82.9±5.6 years in the non-OAC group. The mean CHA_2DS_2VASc score was 4.5±0.3 in the OAC group and 4.2±1.3 in the non-OAC group. The mean HAS-BLED score was 3.0±1.2 in the OAC group and 2.8 ±1.1 in the non-OAC group. The mean clinical frailty score was 5.1±0.9 in the OAC group and 5.5±1.0 in the non-OAC group.

Primary outcome

During the 1-year follow-up, a total of 113 deaths from all causes were recorded in both groups, with 6 deaths (25%) in the OAC group and 107 deaths (55.7%) in the non-OAC group. The HR for overall mortality was 0.33 [95% confidence interval (CI), 0.15-0.75; *p*-value = 0.008]. (Figure 1)

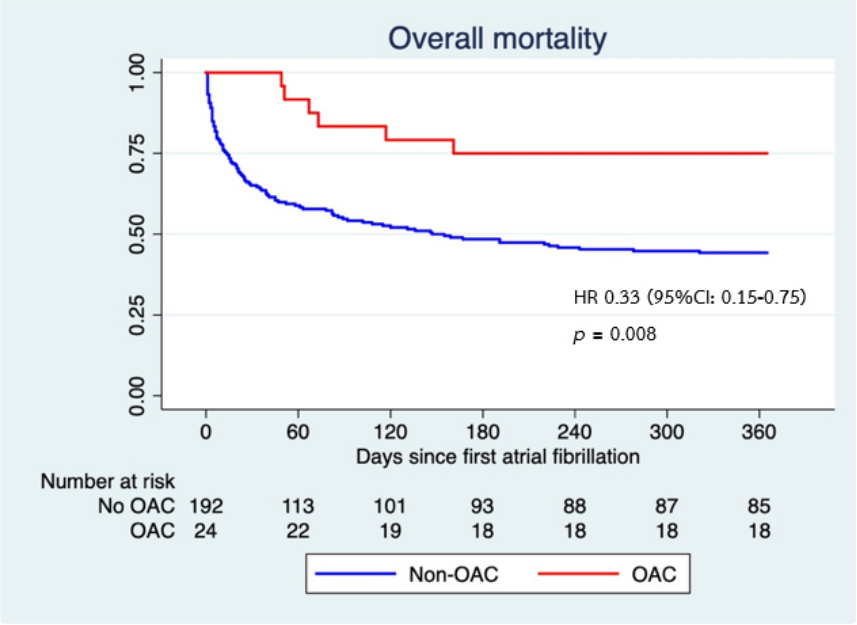

Figure 1 Overall mortality

Table 1 Baseline characteristics

Characteristic	OAC (n = 24)	Non-OAC (n = 192)	*p*-value
Age - mean±SD	81.9±4.2	82.9±5.6	0.411
Male sex - no. (%)	11 (45.8)	95 (49.5)	0.736
CHA_2DS_2-VASc score - mean±SD	4.5±0.3	4.2±1.3	0.336
- ≥ 5 - no. (%)	11 (45.83)	75 (39.06)	0.523
- ≥ 7 - no. (%)	1 (4.17)	12 (6.25)	1.000
HAS-BLED score - mean±SD	3.0±1.2	2.8±1.1	0.506
- ≥ 3 - no. (%)	13 (54.17)	111 (57.81)	0.733
Clinical frailty score - mean±SD	5.1±0.9	5.5±1.0	0.075
- ≥ 6 - no. (%)	9 (37.50)	81 (42.19)	0.661
Hypertension - no. (%)	22 (87.5)	159 (82.8)	0.773
Diabetes mellitus - no. (%)	9 (37.5)	65 (33.9)	0.723
Coronary artery disease - no. (%)	10 (41.7)	38 (19.8)	0.015
Heart failure - no. (%)	5 (20.8)	13 (6.8)	0.035
Cerebrovascular disease - no. (%)	1 (4.2)	28 (14.6)	0.213
Cirrhosis - no. (%)	0	8 (4.17)	0.602
History of bleeding event - no. (%)	2 (8.3)	13 (6.8)	0.676
Concomitant anti-platelet use	11 (45.8)	80 (41.7)	0.697
Concomitant NSAIDs use	1 (4.2)	4 (2.1)	0.448
Current alcohol use	7 (29.17)	38 (19.79)	0.286
Diagnosis of admission			
- Infection	4 (16.7)	93 (48.4)	0.003
- Bleeding	0	17 (8.85)	0.228
- Non-cardiac surgery	8 (33.3)	71 (37.0)	0.727
APACHE II score - total no.	7	53	
- Mean±SD	34.4±3.6	32.5±5.2	0.334
- ≥ 30 - no. (%)	6 (85.7)	39 (73.6)	0.668
Serum creatinine at admission - total no.	23	177	
- Mean±SD	2.2±1.6	1.8±1.7	0.330
- ≥ 1.5 mg/dL - no. (%)	12 (57.1)	63/1 (36.0)	0.054

Univariate analysis of variables was performed to identify potential predictors for inclusion in the multivariate analysis, as illustrated in Table 2. Clinical frailty score greater than 6, cirrhosis, and the diagnosis of infection at admission were identified as significant predictors associated with increased overall mortality. However, the diagnosis of non-cardiac surgery at admission was identified as a significant predictor associated with decreased overall mortality. These results were consistent with both elective and emergency non-cardiac surgeries.

We conducted an additional multivariate analysis. In Model 1, the HR for 12-month overall mortality was 0.38 (95%CI: 0.16-0.89; *p*-value = 0.027) after adjustment for age over 85 years, clinical frailty score greater than 6, underlying cirrhosis, coronary artery disease, the diagnosis of infection, and

Table 2 Relationship between death and variables

Factor	No. / no. total	12-month survival rate (%)	HR (95%CI)	*p*-value
Oral anti-coagulant	24/216	75	0.33 (0.15-0.75)	0.008
Age ≥ 85	67/216	39	1.44 (0.98-2.12)	0.060
Sex; male	106/216	44	1.16 (0.80-1.70)	0.425
CHA_2DS_2-VASc score ≥ 5	86/216	47	1.03 (0.71-1.5)	0.881
CHA_2DS_2-VASc score ≥ 7	13/216	46	0.96 (0.45-2.05)	0.907
HAS-BLED score ≥ 3	124/216	49	0.91 (0.61-1.32)	0.611
Clinical frailty score ≥ 6	90/216	32	1.98 (1.36-2.87)	< 0.001
Hypertension	180/216	49	0.83 (0.52-1.34)	0.445
Diabetes mellitus	74/216	43	1.19 (0.81-1.75)	0.364
Coronary artery disease	48/216	60	0.61 (0.05-1.00)	0.048
Heart failure	18/216	61	0.58 (0.27-1.24)	0.163
Cerebrovascular disease	29/216	45	1.05 (0.62-1.79)	0.850
Cirrhosis	8/216	13	3.05 (1.41-6.62)	0.005
Concomitant anti-platelet use	91/216	54	0.74 (0.50-1.08)	0.116
Diagnosis of admission				
- Infection	97/216	36	1.94 (1.34-2.82)	< 0.001
- Bleeding	17/216	65	0.62 (0.27-1.40)	0.248
- Non-cardiac surgery	79/216	65	0.42 (0.28-0.65)	< 0.001
- Elective surgery	55/216	65	0.41 (0.25-0.68)	0.001
- Emergency surgery	24/216	63	0.45 (0.23-0.90)	0.024
APACHE II score ≥ 30	45/60	40	0.79 (0.38-1.62)	0.516
Serum creatinine at admission ≥ 1.5	75/198	40	1.26 (0.85-1.85)	0.247

non-cardiac surgery (both elective and emergency) at admission. In Model 2, the HR for 12-month overall mortality was 0.39 (95%CI: 0.17-0.92; *p*-value = 0.031) after adjustment for age over 85 years, clinical frailty score greater than 6, CHA2DS2-VASc score higher than 7, underlying diseases of diabetes, hypertension, coronary artery disease, heart failure, old ischemic stroke, and cirrhosis, as well as the diagnosis of infection and non-cardiac surgery (both elective and emergency) at admission.

Throughout the index admission, a total of 84 deaths (38.9%) occurred in both groups. The leading cause of death was infection-related (77 out of 84 deaths, 91.7%), followed by bleeding-related deaths (5 out of 84 deaths, 6%), and cardiovascular deaths (2 out of 84 deaths, 2.4%). In-hospital mortality was predominantly observed in the non-OAC group, accounting for 83 out of 84 deaths (98.8%). After an exclusion of in-hospital mortality, there were 5 deaths (21.7%) in the OAC group and 24 deaths (22%) in the non-OAC group. The HR for overall mortality, after excluding in-hospital mortality, was 0.93 (95%CI: 0.36-2.42; *p*-value = 0.879). (Figure 2)

Secondary outcomes

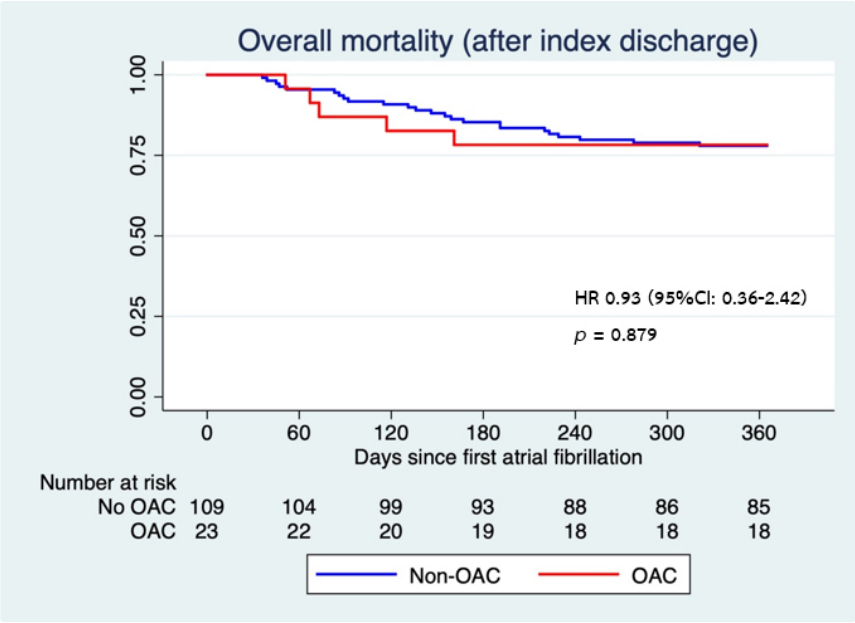

Figure 2 Overall mortality (after index discharge)

Table 3 Cardiovascular death

Case	Sex	Age	Underlying disease	HAS-BLED score	Clinical frailty score	Diagnosis of admission	Cause of death
1	Female	80	Hypertension Severe symptomatic AS with chronic HF	4	7	Congestive HF	HF death
2	Male	82	Hypertension CKD stage IV BPH Gout	3	5	Toxic epidermal necrolysis	Sudden cardiac arrest

Throughout the 1-year follow-up, there were 2 cardiovascular deaths (1%) in the non-OAC group, while none were observed in the OAC group. The characteristics of participants with cardiovascular death are detailed in Table 3. There were 6 non-cardiovascular deaths (25%) in the OAC group and 103 non-cardiovascular deaths (53.6%) in the non-OAC group. The HR for non-cardiovascular death was 0.35 (95%CI: 0.15-0.80; *p*-value = 0.013) (Figure 3). There were 4 non-fatal strokes (2.1%) in the non-OAC group, while none were reported in the OAC group. The characteristics of participants with non-fatal stroke are detailed in Table 4. There were 13 3P-MACE (6.8%) reported in the non-OAC group, while none occurred in the OAC group. There were 3 bleeding events (12.5%) in the OAC group and 4 bleeding events (2.1%) in the non-OAC group. The HR for bleeding event was 6.11 (95%CI: 1.37-27.32; *p*-value = 0.018) (Figure 4). There were 8 rehospitalizations (33.3%) reported in the OAC group and 35 rehospitalizations (18.2%) in the non-OAC group. The HR for rehospitalization was 1.91 (95%CI: 0.89-4.12; *p*-value = 0.098) (Figure 5). All secondary outcomes are presented in Table 5.

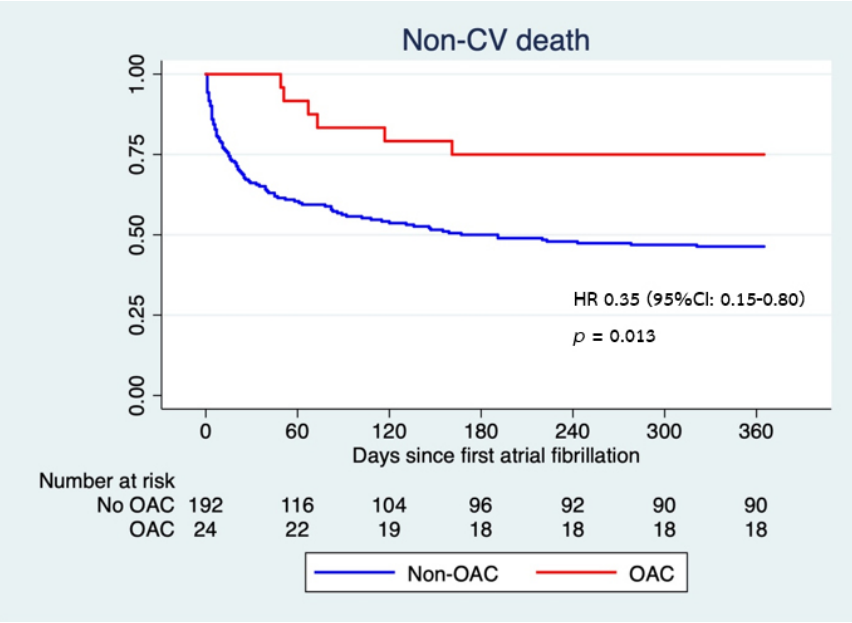

Figure 3 Non-cardiovascular death

Table 4 Non-fatal stroke

Case	Sex	Age	Underlying disease	HAS-BLED score	Clinical frailty score	Clinical frailty score	Diagnosis of admission
1	Female	91	Hypertension Dyslipidemia Asthma	4	7	6	Cellulitis
2	Female	82	Hypertension Dyslipidemia Gout	3	4	4	Idiopathic inflammatory myopathy
3	Female	82	Hypertension Rheumatoid arthritis Allergic rhinitis Bronchiectasis	2	4	5	UTI septic shock
4	Male	77	Hypertension T2DM Dyslipidemia CKD stage IIIa Old ischemic stroke	4	6	6	Traumatic subdural hematoma

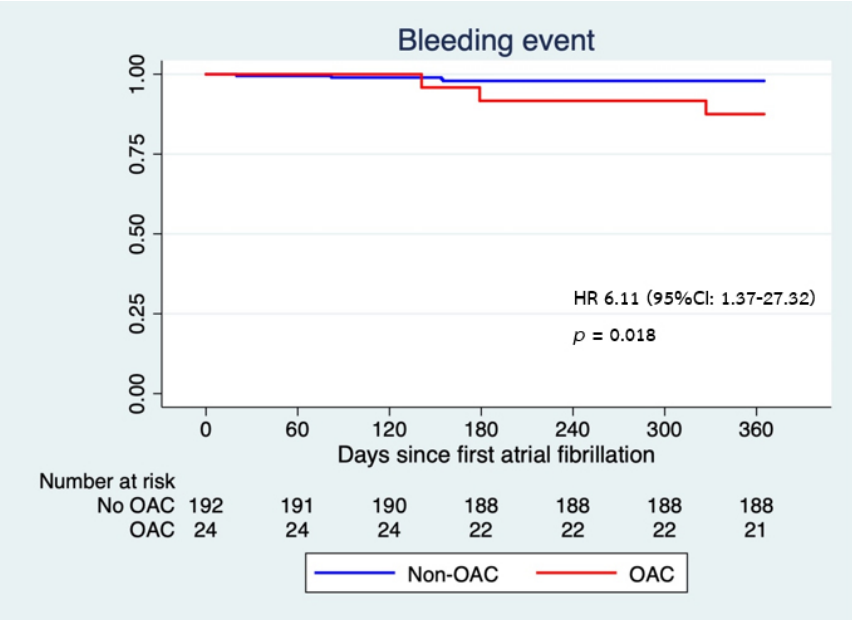

Figure 4 Bleeding event

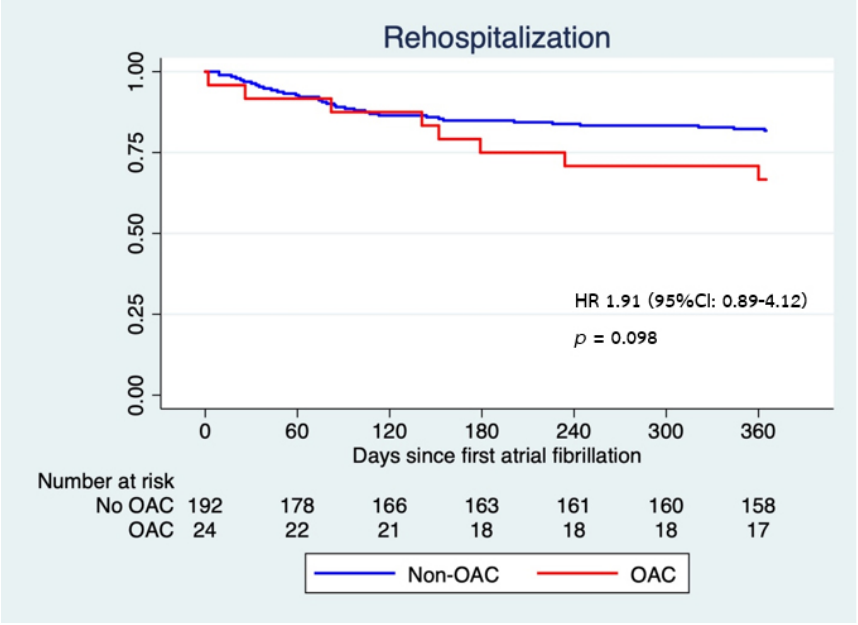

Figure 5 Rehospitalization

Table 5 Outcome

Outcome	OAC	Non-OAC	Hazard ratio	*p*-value
Overall mortality				
- No. of patient with event/ total no. (%)	6/24 (25)	107/192 (55.7)	0.33 (0.15-0.75)	0.008
Cardiovascular death				
- No. of patient with event/ total no. (%)	0/24	2/192 (1)	-	-
Non-cardiovascular death				
- No. of patient with event/ total no. (%)	6/24 (25)	103/192 (53.6)	0.35 (0.15-0.80)	0.013
Overall mortality (after index discharge)				
- No. of patient with event/ total no. (%)	5/23 (21.7)	24/109 (22)	0.93 (0.36-2.42)	0.879
Stroke				
- No. of patient with event/ total no. (%)	0/24	4/192 (2.1)	-	-
Bleeding event				
- No. of patient with event/ total no. (%)	3/24 (12.5)	4/192 (2.1)	6.11 (1.37-27.32)	0.018
Rehospitalization				
- No. of patient with event/ total no. (%)	8/24 (33.3)	35/192 (18.2)	1.91 (0.89-4.12)	0.098

Discussion

The study revealed that OAC therapy in admitted elderly patient with newly diagnosed AF or atrial flutter resulted in a lower 12-month overall mortality compared to non-OAC therapy with an HR of 0.33, 95%CI: 0.15-0.75, *p*-value = 0.008. Due to limited sample size, we calculated the post-hoc power to be 84% with an alpha of 0.05. The observed benefits of OAC therapy remained consistent after a multivariate analysis with Model 1 and 2. However, it's noteworthy that 38.9% of deaths in this study occurred during the index hospitalization and were predominantly non-cardiovascular in nature (96.4% of all deaths). It appears that the benefit observed is the independence of protective effects against thromboembolism provided by OAC therapy. The possible explanation is confounder by indication. Attending physicians may observed certain clinical prognostic factors indicating a higher mortality in the non-OAC group. Sepsis could be a prognostic factor. Participants with a principal diagnosis of infection upon index admission were statistically numerous in the non-OAC group. In elderly patients, sepsis increased both hospital mortality rate[14-15] and bleeding risk due to consumption of coagulation factors and platelets[16-17]. Additionally, there was no participant with a principal diagnosis of bleeding event upon index admission in the OAC group. Bleeding event might be a major concern for attending physicians to refrain from initiating OAC. There may be additional clinical prognostic factors that were not observable in the retrospective study. A further prospective cohort study is needed to clarify these underlying prognostic factors.

After excluding in-hospital mortality, the study could not demonstrate the benefit of initiating OAC therapy in admitted elderly patients with newly diagnosed AF or atrial flutter, in terms of 12-month overall mortality. The most important reason was the limited study population after the exclusion of in-hospital mortality.

In the study, no non-fatal stroke was observed in the OAC group. While this suggests potential benefits of stroke prevention in the elderly, the study, however, did not quantify the magnitude of this effect. Other than the limited power of the study, one potential explanation for the relatively low incidence of stroke (2.1%) in this study could be considered. The mean CHA_2DS_2VASc score in the study was 4.2 in the non-OAC group, anticipating a stroke risk ranging from 3.2% to 7.2%. Furthermore, recent data on Chinese patients revealed that the annual stroke risk in patients older than 80 with a CHA_2DS_2VASc score of 4 was 11.8%[18], which was higher than that observed in this study. In retrospect, three out of four non-fatal strokes in this study could potentially have benefitted from oral anticoagulant therapy, considering the high CHA2DS2VASc score, if there were no absolute contraindications.

Bleeding events were significantly higher in the OAC group than in the non-OAC group with a HR of 6.11. However, there were 3 bleeding events (12.5%) in the OAC group, which was higher than anticipated. The mean HAS-BLED score in the OAC group was 3, accounting for 5.8% of bleeding risk[19]. The possible explanation is the predominantly use of warfarin (91.7%) in the OAC group, which is associated with a higher bleeding risk in elderly compared to non-vitamin K oral anticoagulant.[20-22] Warfarin is still a challenging treatment in elderly because o fmany possible drug-drug and drug-food interactions leading to a labile INR.

Our study had several limitations. Firstly, the main consideration in the study was the limited study population. Despite being a retrospective study, only 216 participants were initially included. Efforts were made to include as many patients as possible, but there were several limitations. The retrospective nature of the study meant that the completeness of medical records depended on attending physicians, resulting in some data being lost over time. Additionally, there might be issues with the coding of ICD in Thailand, potentially affecting the accuracy and leading to the loss of eligible participants. Moreover, the lack of connectivity in the Thai health system meant that many participants who were lost to follow-up and could not be reached by telephone were also excluded from this study. Secondly, as previously discussed, confounding by indication may contribute to confounding in the study.

Conclusion

After excluding in-hospital mortality, this study could not demonstrate the benefit of initiating OAC, primarily warfarin, in admitted elderly patients with newly diagnosed AF or atrial flutter, in terms of 12-month overall mortality, due to limited study population. The benefits of OAC initiation in patients newly diagnosed with AF during hospitalization may be restricted by patients' active conditions. In admitted elderly patients newly diagnosed with AF, OAC initiation is a challenging treatment due to its complexities on stroke risk, bleeding risk, functional status, and residual life expectancy. Furthermore, it requires a comprehensive counselling among the attending physician, the patient, and the main caregiver. While stroke prevention post-hospitalization in elderly patient AF or atrial flutter is recommended, further studies are required to determine the optimal timing for initiating OAC therapy to maximize the benefit of stroke prevention while minimizing bleeding risks.

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