Prevalence, Risk factors and Pharmacological treatment of Atrial Fibrillation in Older Hospitalized Patients in Vietnam

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Abstract

Background: The evidence about prevalence of atrial fibrillation (AF) in Vietnam is very limited and there have been no published studies about the pharmacological treatment of AF in older Vietnamese patients. This study aims to investigate the prevalence of AF, its associated factors and pharmacological treatment in older hospitalized patients in Vietnam. The secondary aim is to investigate the impact of frailty, an emerging geriatric syndrome which is still a new concept in Vietnam, on the pharmacological treatment of AF.

Methods: We used data from a study of the prevalence of frailty in older hospitalized patients at the National Geriatric Hospital in Hanoi, Vietnam. Consecutive patients aged ≥60 years were recruited from 4/2015 to 10/2015.

Results: A total of 461 patients was recruited, 56.8% were female, and mean age was 76.2±8.9. The prevalence of AF was 3.9% (18 patients). Amongst patients with AF, the most common medical conditions were hypertension (72.2%), followed by stroke (55.6%), heart failure (50.0%), type2 diabetes (44.4%). Living alone (OR=10.2, 95%CI 1.5–70.1), having a habit of using vitamins at home (OR=3.8, 95%CI 1.1–13.4), having heart failure (OR=31.3, 95%CI 9.6–101.8), and having type 2 diabetes (OR=3.5, 95%CI 1.2–10.7) were associated with the presence of AF on admission. All patients with AF had a high risk of stroke (CHA2DS2-VASc score≥2) and 72.2% of them had a high risk of bleeding with anticoagulant medications (HAS-BLED score≥3). Only 22.2% were anticoagulated on admission and 22.2% upon discharge, with no difference between frail and non-frail patients.

Conclusions: The prevalence of AF among older hospitalized patients in Vietnam is similar to that reported in other countries. Anticoagulation for stroke prevention was underused, without any significant difference between frail and non-frail patients.

Keywords: Atrial fibrillation; prevalence; Vietnam; risk factors; frailty.


Introduction

Atrial fibrillation (AF) is a common cardiac arrhythmia in older adults. The global burden of AF has been increasing due to the aging of the world’s population [1]. The rates of AF related hospitalizations have increased worldwide over the last decades [2-4]. The prevalence of AF in Western countries ranges from 0.5% to 4% in the general population [5-7] and 3% to 24% in hospitalized patients [8-10]. In developing countries, the prevalence of AF in studies conducted in the community has ranged from 0.03% to 1.25%, while the prevalence of AF in hospital-based studies has varied from 0.7% to 55.7% [11]. As people with AF have an increased risk of stroke, treatment of AF aims at stroke prevention with anticoagulant therapies, reducing symptoms with rate-control or rhythm-control strategies, and management of associated medical conditions [10]. Anticoagulation therapy (with anti-vitamin K or newer oral anticoagulants) in patients with AF has been shown to reduce the frequency, severity and mortality from stroke [12]. However, despite the evident benefits of anticoagulants in preventing...
stroke, studies have shown that anticoagulants are underutilized in patients with AF, especially in older patients due to increased bleeding risk [13-16].

In Vietnam the population is aging rapidly, with the older population (aged 60 or over) increasing from 8.7% of the total population in 2009 to 26.1% in 2049 [17]. One study found that nearly 40% of older people in the community in Vietnam had multimorbidity [18]. Cardiovascular disease is the leading cause of death in Vietnam [19-21]. The evidence of prevalence of AF in the general population or in hospitalized patients in Vietnam is very limited: a study found that around 1.3% of patients hospitalized with a first acute myocardial infarction had AF [22] and another found AF prevalence of to 6.6% in patients hospitalized with a first stroke [23]. There have been no published studies about the pharmacological treatment of AF in older patients in Vietnam. Therefore, the primary aims of this study were to investigate the prevalence of AF among older hospitalized patients, its risk factors and pharmacological treatment. The secondary aim was to investigate the impact of frailty, an emerging geriatric syndrome which is still a new concept in Vietnam, on the pharmacological treatment of AF.

Methods
Study population
We used data from a study of the prevalence of frailty in older hospitalized patients at the National Geriatric Hospital in Hanoi, Vietnam. In this observational study, consecutive patients aged ≥60 years admitted to the hospital on weekdays between April 2015 and October 2015 were recruited by two medically qualified master students. The National Geriatric Hospital in Hanoi is the only geriatric hospital in Vietnam and it provides care for older patients in Hanoi and the Northern provinces of Vietnam. The study was approved by the National Geriatric Hospital Ethics Committee. All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1964, as revised in 2013. Hospitalized patients were eligible to participate if they were aged ≥60 years. Participants who were dying or receiving intensive care or who were identified as “blind” or “deaf” were excluded from the study. Eligible patients were identified daily from the target wards (cardiology, general medicine, endocrinology, neurology and the private general medicine ward) and invited to participate. Oral consent was obtained from all participants.

Data collection included socio-demographics, detailed medical history, co-morbidities, clinical assessments and prescribed medications and non-prescription medications. All patients had an electrocardiogram on admission, and these electrocardiograms were reviewed by the study doctors. Atrial fibrillation was first identified based on the electrocardiogram on admission, then confirmed with at least one electrocardiogram during hospitalization. Patients with AF were evaluated for stroke risk using the CHA2DS2-VASc score (oral anticoagulants are recommended for patients with high risk of stroke on this scale) [24]. The individual components of the CHA2DS2-VASc score include: congestive heart failure (1 point), hypertension (1 point), age ≥75 years (2 points), diabetes mellitus (1 point), stroke/TIA (2 points), vascular disease (prior myocardial infarction, peripheral artery disease or aortic plaque) (1 point), age 65–74 years (1 point), female gender (1 point). The maximum score is nine and a total score of two or above indicates a high risk of stroke. Bleeding risk for anticoagulants was assessed with the HAS-BLED score. One point is assigned for each individual components, including hypertension, abnormal renal function (dialysis, kidney transplant, creatinine clearance >200μmol/L), abnormal liver function (cirrhosis or bilirubin>2x normal or AST - Aspartate aminotransferase/ALT - Alanine aminotransferase/ALP - alkaline phosphatase 3x normal), stroke history, history of major bleeding or predisposition to bleeding, labile INRs (international normalized ratios) if on warfarin, age >65 years, concomitant antiplatelet or non-steroidal anti-inflammatory drugs (NSAIDs) use, and alcohol abuse. The maximum score is nine and a total score of three or above indicates a high risk of bleeding [25]. The Reported Edmonton Frail Scale (REFS) was used to identify frail participants. This scale has been applied in many studies in acute inpatients [26-31]. The scale involves nine frailty domains (cognition, general health status, functional independence, social support, medication use, nutrition, mood, continence and functional performance). With a maximum score of 18, the cut point used to identify frailty was eight, consistent with previous studies using this scale [26-31].

Statistical Method
Analysis of the data was performed using SPSS for Windows 20.0 (IBM Corp., Armonk, NY, USA). Continuous variables are presented as mean ± standard deviation, and categorical variables as frequency and percentage. Comparisons between frail and non-frail participants were assessed using the Chi-square test or Fisher’s exact test for categorical variables and Student’s t-test or Mann-Whitney test for continuous variables. Multivariate logistic regression was applied to identify risk factors for prevalent AF on admission. Univariate logistic regression was performed on all the potential risk factors for AF (age, gender, frailty status, nutrition status, overweight, smoking, alcohol abuse, hypertension, ischemic heart disease, heart failure, type 2 diabetes, peripheral vascular disease, dyslipidemia, chronic pulmonary disease, dementia, depression, thyroid disorders, habits of using herbal medicine, using vitamins, and socioeconomic factors as education, residential status). Only variables that had a p-value <0.20 on univariate analysis were selected for multivariate analysis. A backward elimination method was applied and the final model retained variables significant at p<0.05. All variables were examined for interaction and multicollinearity.

Results
Prevalence of atrial fibrillation and associated medical conditions
A total of 461 participants was recruited, with 56.8% female, and a mean age of 76.2 ± 8.9 (median 77.0, range 60 - 98). The prevalence of AF was 3.9% (18/461). Compared to patients without AF, patients with AF had significantly higher prevalence of overweight, heart failure, type 2 diabetes, living alone and higher Charlson comorbidities index. Amongst patients with AF, the most common associated medical conditions were hypertension (72.2%), followed by stroke (55.6%), heart failure (50.0%), type 2 diabetes (44.4%), ischemic heart disease (16.7%) and chronic pulmonary disease (16.7%) (Table 1).

Risk factors for prevalent AF on admission
In the final model, living alone (OR=10.23, 95%CI 1.49 – 70.11), having a habit of using vitamins at home as self-medication (OR=3.77, 95%CI 1.06 – 13.37), having heart failure (OR=31.29,
95%CI 9.62 – 101.75), and having type 2 diabetes (OR=3.53, 95%CI 1.17 - 10.69) were associated with the presence of AF on admission. These variables significantly predicted risk factors for prevalent AF on admission (Table 2).

Stroke risk and bleeding risk
All patients with AF had a high risk of stroke (CHA2DS2-VASc score ≥2) and 72.2% of them had a high risk of bleeding with anticoagulant medications (HAS-BLED score ≥3) (Table 3 and Table 4).

Treatment of AF
On admission, only 4 of the 18 patients with AF (22.2%) were using anti-vitamin K (sintrom, acenocoumarol). Upon discharge, the prevalence of oral anticoagulant prescription was also 4/18 (22.2%) (3 patients prescribed anti-vitamin K and 1 patient prescribed dabigatran). During hospitalization, anti-vitamin K was stopped in two patients and started in two patients. Upon discharge, half of the patients with AF did not receive any anti-arrhythmic drugs. Rate control therapy was prescribed in 8/18 (44.4%), digoxin was the most common rate-control medication.
The risk of having AF. This could be a public health concern as the habit of using vitamins at home as self-medication may increase a higher risk of AF (33). Interestingly, our study suggests that the development of AF (32). Patients with metabolic syndrome have structure and increased left atrial pressure are closely linked to the relationship between heart failure and AF, in which changes in atrial of AF is complicated and not fully understood, there is a close relationship between heart failure and AF, which may make the comparisons of anticoagulant use around the world [11].

Table 3. Stroke risk identified by CHA2DS2-VASc score

<table>
<thead>
<tr>
<th>Variables</th>
<th>All (N=18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean CHA2DS2-VASc score</td>
<td>5.11 ± 1.81</td>
</tr>
<tr>
<td>CHA2DS2-VASc score ≥2</td>
<td>18 (100%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual components of CHA2DS2-VASc score, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Congestive heart failure</td>
</tr>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Age≥75</td>
</tr>
<tr>
<td>Age 65-74</td>
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<tr>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>Vascular disease</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

Table 4. Bleeding risk assessment with HAS-BLED score

<table>
<thead>
<tr>
<th>Variables</th>
<th>All (N=18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean HAS-BLED score</td>
<td>3.56 ± 1.89</td>
</tr>
<tr>
<td>HAS-BLED score ≥3</td>
<td>13 (72.2%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Individual components of HAS-BLED score, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
</tr>
<tr>
<td>Abnormal renal function</td>
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<tr>
<td>Abnormal liver function</td>
</tr>
<tr>
<td>Stroke</td>
</tr>
<tr>
<td>Bleeding history/predisposition to bleeding</td>
</tr>
<tr>
<td>Age ≥ 65</td>
</tr>
<tr>
<td>Labile INR</td>
</tr>
<tr>
<td>Aspirin/NSAIDs using</td>
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<tr>
<td>Alcohol abuse</td>
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INR: International Normalised Ratio; NSAIDs: Non-steroidal Anti-inflammatory Drugs

6/18 (33.3%), followed by beta-blockers 3/18 (16.7%) and amiodarone 1/18 (5.6%).

The impact of a frailty status on the pharmacological treatment of AF

Among the 18 patients with AF, 7 were frail (38.9%). The prevalence of anticoagulant use was lower in the frail compared to the non-frail, however the difference was not statistically significant: 1/7 (14.3%) frail versus 3/11 (27.3%) non-frail on admission (p=1.00), and 0/7 (0%) frail versus 4/11 (36.4%) non-frail on discharge (p=0.12). There was also no significant difference in anti-arrhythmic medication use between the frail and the non-frail. On admission, 6/7 (85.8%) frail patients were not prescribed any anti-arrhythmic medication versus 9/11 (81.8%) in the non-frail (p=1.00). Upon discharge, 4/7 (57.1%) frail patients and 5/11 (45.5%) non-frail patients were not prescribed any anti-arrhythmic medication (p=1.00). Small sample size did not allow any further analysis.

Discussion

In this study in Hanoi in Vietnam we found that AF was present in 3.9% of older patients in internal medicine wards. This finding is consistent with studies elsewhere, in which AF has been reported to be present in 3%-6% of acute medical admissions in some developed countries [10] and 1% to nearly 6.5% in general patients in some developing countries [11].

In this study, hypertension, heart failure and diabetes were the diagnoses most commonly associated with AF. This finding is similar to many other studies [11]. Our study showed that the likelihood of the presence of AF on admission increased in patients with heart failure or type 2 diabetes, and in patients living alone or having a habit of using vitamins at home. Although the pathophysiology of AF is complicated and not fully understood, there is a close relationship between heart failure and AF, in which changes in atrial structure and increased left atrial pressure are closely linked to the development of AF (32). Patients with metabolic syndrome have a higher risk of AF (33). Interestingly, our study suggests that the habit of using vitamins at home as self-medication may increase the risk of having AF. This could be a public health concern as the prevalence of self-medication is very high in Vietnam [34]. In fact, the link between excessive vitamin D intake and an increased risk of AF has been reported in several studies [33, 35]. Studies on the utilization of self-medications, especially vitamins, in Vietnam are needed in the future. In Vietnam, most older people live with their children [36]. In this study, only 1.6% of patients without AF were living alone, but the frequency was significantly higher in those with AF (11.1%), which could be a concern for anticoagulant using and monitoring.

The prevalence of stroke in this study was quite high: 40.3% in the study population overall and 55.6% in patients with AF. Although age-adjusted stroke incidence has nearly halved in high-income countries over the past 40 years, it has increased by more than 100% in low and middle income countries over the same period [37]. The prevalence of stroke in our study was also higher compared to the prevalence of stroke in hospitalized patients with AF in other developing countries, which has ranged from 10% to 27% [11].

In this study, all patients with AF had a high risk of stroke as shown by a CHA2DS2-VASc score of two or above, which is the indication for anticoagulants, but the prevalence of patients with high risk of bleeding for anticoagulant was also high (72.2%). Anticoagulation was underused in patients with AF. Only 22.2% were anticoagulated on admission (4/18) and the same percentage upon discharge (4/18), which is higher compared to the prevalence of stroke in hospitalized patients with AF in other developing countries, which has ranged from 10% to 27% [11].

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Limitations

The major limit of this study is the small number of participants with AF, which may make the comparisons of anticoagulant use in frail and non-frail patients less meaningful. This study was not designed to investigate the prevalence of AF in older patients although this was a pre-planned sub-analysis. Another limitation...
is that patients admitted to the hospital during weekends and holidays were missed, and not all wards were included. We also recognize that patients admitted to the National Geriatric Hospital may not be representative of all older patients in Vietnam.

Conclusions

In this study the prevalence of AF among older hospitalized patients in Vietnam was 3.9%. Predictive factors for AF were heart failure, type 2 diabetes, living alone, and a habit of using vitamins as self-medication. Anticoagulation for stroke prevention was underused, without any significant difference between frail and non-frail patients. To our knowledge, this is the first study to comprehensively address prevalence, risk factors, and management of AF in older patients in Vietnam. These findings suggest that in patients with AF in Vietnam, it is important to check for heart failure and diabetes. These findings also support further development of cohort studies in Vietnam on the management of AF in older people with larger sample sizes to examine the impact of frailty on anticoagulation prescription and outcomes, and to identify whether the high prevalence of stroke in older patients in Vietnam is partly due to poor anticoagulation management and follow up.

Declarations of Interest

The authors declare no conflicts of interest.

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References


