Original article

Antithrombotic agents and Risk Profile of Patients with Atrial Fibrillation from Rural Part of Nepal

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Abstract:

Introduction: Atrial fibrillation (AF) is an atrial tachyarrhythmia characterized by uncoordinated activation of atria with subsequent impairment of atrial mechanical function. Anticoagulation with warfarin decreases the ischemic stroke risk associated with AF. Although the trends of anticoagulation use and risk profiles of AF is available from different countries, but, there is scarcity of data from Nepal. Hence, the study was carried out to determine the current practices of antithrombotic use in rural Nepal.

Methods: A total of 240 patients from January 2012 to September 2014 with and without admitted but diagnosis of atrial fibrillation (AF) were enrolled from Lumbini Medical College, Palpa. Demographic information, clinical history, co-morbid conditions, use of anticoagulants and risk factors for stroke were obtained from questionnaire designated.Clinical examinations were performed along with electrocardiography and echocardiography from each patient.

Results: A total of 240 patients, diagnosis with atrial fibrillation (AF)from outpatientor admitted, the mean ranged was 63.3 years (20 to 90). Male: female ratio was 0.84. Majority of patients (60%) were of age >60 years. Mean heart rate was 98 bpm. Among risk factors for AF, hypertension, rheumatic heart disease, systolic and diastolic heart failure, dilated cardiomyopathy, ischemic heart diseases were common underlying problems. Ninety percent of patients had dilated left atrium (>40mm). Among patients with non-valvular AF, 39.1% had CHADS2 score of $\geq$ 2 who were eligible for oralanticoagulants and 18.9 % patients received it.Out of 44 with rheumatic heart disease and AF, 10(22.7%) patients obtained oral anticoagulants.

Conclusions: The findings highlight the need for improved treatments of underlying risk factors to prevent the onset of AF and adequate use of OACs to prevent stroke risk.

Key words: Atrial fibrillation, clinical characteristics, risk factors

Introduction:

Atrial fibrillation is an atrial tachyarrhythmia characterized by uncoordinated activation of atria with subsequent impairment of atrial mechanical function. The prevalence of AF depends upon the population studied; the risk increases with age and with underlying heart disease[1,2]. Patients with AF are at increased risk of mortality, for deterioration of hemodynamics due to increased heart rate, loss of atrioventricular synchrony, progressive dysfunction of the left atrium and left ventricle, and stroke and other embolic events from atrial thrombi[3, 4]. Hypertensive heart disease and coronary heart disease are the most common underlying disorders in patients with AF in developed countries. Rheumatic heart disease, although now uncommon in developed countries, is associated with a much higher incidence of AF. Other frequent causes include alcohol excess,[5] heart failure, post cardiac surgery,[6] and hyperthythyroidism.[7] Subclinical markers indicating increased AF risk include increased arterial stiffness[8] and echocardiography evidence of structural heart disease such as left atrial enlargement, left ventricular hypertrophy, and left ventricular systolic

and diastolic dysfunction[9,10]. Lone AF is an entity which is referred to patient without structural heart disease and primarily applied to patients <60 years of age and are at lowest risk of complications associated with AF[11,12].

Anticoagulation with warfarin decreases the ischemic stroke risk associated with AF. Unfortunately, anticoagulationitself carries a significant risk of bleeding complications

Although information regarding the trends of anticoagulation use and risk profiles of AF is available from various studies done in different countries, there is paucity of data from our country. Hence, this study will give insight about the practice of antithrombotic useas suggested by the current guidelines and risk profile of patients with AF from rural areas of Nepal.

Methods:

An observational cross-sectional study on clinical profile of 240 patients with AF was conducted from January 2012 to September 2014 who waseither admitted or attending outpatient department of medicine of Lumbini Medical College Teaching Hospital, Palpa, Nepal. All patients included in the study were asked relevant questions to note demographic profile, symptoms, co-morbid conditions, use of anticoagulants and risk factors for strokeas per structured questionnaire. Physical and systemic examination was performed with due attention on cardiovascular examination. Electrocardiography and Echocardiography were performed in each case. Data analysis was done using Microsoft Exel. Data were expressed as absolute number of subjects, percentage or mean.

Results:

This study was performed in 240 patients with diagnosis of AF who attended outpatient department or admitted in internal medicine ward ofLumbini Medical College, palpa fromJanuary 2012 to September 2014. Baseline characteristics of patients with atrial fibrillation have been shown in table 1. Age of patients ranged from 20 to 90 years (mean 63.3 years). Majority of patients (60%) were of age >60 years. Mean heart rate was 98 bpm. Common symptoms at presentation were dyspnea on exertion, palpitation, fatiguability, dizziness depicted in table 2. Among risk factors for AF-diastolic heart failure (55%), hypertension (30.8%),systolic heart failure (30%) rheumatic heart disease (18.3%), and ischemic heart disease (17.5%), dilated cardiomyopathy(12.5%), were common underlying diseases as shown in figure 1. Different electrocardiographic and echocardiography findings have been shown in table 3.Common electrocardiographic findings were fast ventricular rate (48.3%), left ventricular hypertrophy(15.8%), right ventricular hypertrophy(10%), left bundle branch block(8.3%) and right bundle branch block(3.3%). Among echocardiographic parameters, 81.6 % patients had non-valvular AF, 73.3% had depressed ejection fraction, and 55% patients had diastolic dysfunction. Ninety percent of patients had dilated left atrium (>40mm). Anticoagulant prophylaxis according to each CHADS2 score is summarized in figure 2 and table 4.Among patients with non-valvular AF, 39.1% had CHADS2 score of ≥ 2 who were eligible for oral anticoagulation but only 18.9 % patients received it.Out of 44(18.33%) with rheumatic heart disease and AF, only 10(22.7%) patients were receiving oral anticoagulants depicted in figure 3.

Table 1: Baseline characteristics of patients with atrial fibrillation(N=240)

Age (years): 20-40	16 (6.6%)
41-60	80 (33.3%)
>60	144 (60%)
Sex : Male	110 (45.8%)
Female	130 (54.1%)
Heart Rate (mean)	98
Mean blood pressure (mmHg)	
Systolic	123.83
Diastolic	78.25
Smoking	118 (49.1%)
Hypertension	74 (30.8%)
Diabetes Mellitus	74 (30.85)
Alcohol consumption	34 (14.1%)

Table 2: Symptoms in patients with Atrial Fibrillation(N-240)

Dyspnea(NYHA class I-IV)	I= 120 (50%), II=40 (16.6%), III=80 (33.3%)
Palpitation	94 (39.1%)
Dizziness	66 (27.5%)
Fatigability	60 (25%)
Hypotension	28 (11.6%)
Stroke/TIA	22 (9.1%)

Asymptomatic	22 (9.1%)
Chest pain	20 (8.3%)
Others: orthopnea, pedal edema, cough	20 (8.3%)

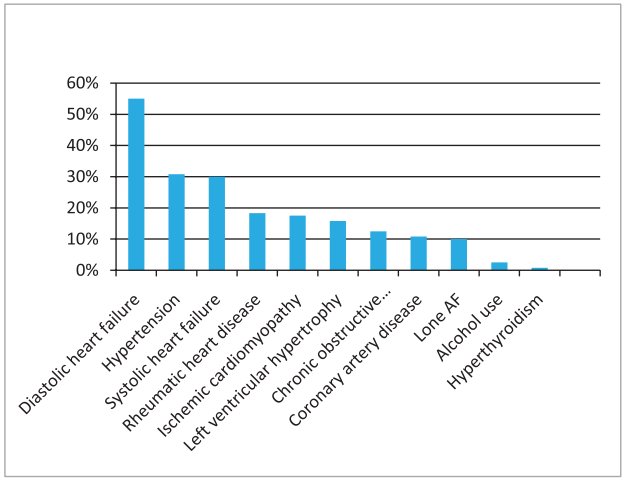

Figure 1: Risk factors associated with Atrial Fibrillation(N-240)

Table 3 : Electrocardiographic andEchocardiographic findings in patients with AF (N-240)

Echocardiography		Electrocardiogram	
Non- valvular AF	196 (81.66%)	Heart Rate	124 (51.6%)
Valvular AF	44 (18.33%)		116 (48.3%)
		<100	
		>100	
Ejection Fraction (mean)	53.84 %	ST-T changes	80(33.33%)
<40%	64 (26.6%)		
>40%	176 (73.3%)		
Diastolic dysfunction	132(55%)	LVH	38 (15.8%)
Mean LA diameter (cm)	5.18	RVH	24 (10%)
<4	24 (10%)	LBBB	20 (8.3%)
4-5	160 (66.6%)	RBBB	8 (3.3%)
>5	56 (23.3%)		
Rheumatic Heart Disease	44 (18.3%)		
Cor pulmonale	26 (10.8%)		

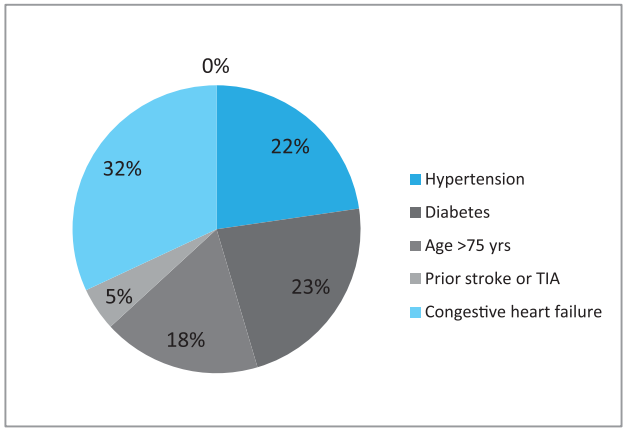

Figure 2: Risk factors for stroke (CHADS2) in patients with non-valvularAF (N=196)

Table 4:CHADS2 score and antithrombotics use in patients with non valvularAF (N=196)

CHADS2 score	0	1	2	≥3
No. of patients (N=196)	49 (25%)	70 (42.16%)	58 (29.5%)	19 (9.6%)
Aspirin	24(48.9%)	30(42.8%)	34(58.6%)	10 (52.6%)
Warfarin	-	2(2.8%)	8(13.7%)	4 (21%)
Nicoumalone	-	2(2.8%)	2 (3.4%)	-
None	25(51%)	36(51.4%)	14(24.1%)	5(26.3%)

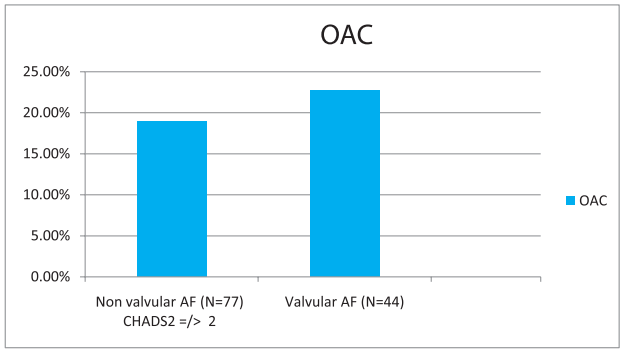

Figure 3: Percentage of Patients receiving oral anticoagulants who are eligible for it

Discussion

In the study, majority of the subjects were of age >60 years and which is similar to other studies where both the incidence and the prevalence of AF are age dependent[13, 14].

Although the prevalence of AF doubles with each decade of age, after adjusting for other predisposing conditions, male sex is associated with a 1.5-fold risk of developing AF[15- 17]. But in this study prevalence among female was more than male.The association between hypertension and AF is well established[18]. it is estimated that hypertension is responsible for 14% of all cases of AF.[18] About one third of our patients had underlying hypertension. AF and heart failure (HF) often coexist; with a prevalence of AF that increases with the severity of HF symptoms[19]. The association is not limited to systolic left ventricular dysfunction. Diastolic heart failure is also associated with an increased AF incidence, possibly reflecting shared risk factors such as advancing age and hypertension. Similar to other study, 30% of our patients had systolic heart failure and 55% had diastolic heart failure.Valvular heart disease is associatedwith increased risk for AF in both men and women[18]. Although any valvular pathology can be related to AF,stenotic left-sided valvularlesions have the highest prevalence rates. In our study, 18.3% of patients hadvalvular heart disease who presented with AF.

Patients withAF have an increased prevalence of CAD compared with those without AF[20]. In our study, 17.5% patients had ischemic cardiomyopathy and 10.8% had underlying CAD.

Tobacco use has been linked to AF development, with a dose–response effect [21]. Consistent with this finding, 49.1% of our patients had history of smoking. Diabetes is linked to onset of AF with longer duration of treated diabetes mellitus and worse glycemic control has been independently associated with increased risk of AF[22]. About one third of our patients population had history of DM.

The relationship between ethanol consumption and AF has been proven with acute AF paroxysms associated with binge drinking. Heavy alcohol consumption is associated with increased risk for new-onset AF [23, 24]. Only minority of our patients (2.5%) had history of alcohol abuse who presented with AF.

Although overt hyperthyroidism has long been associatedwith an increased risk of AF[25], only 0.2% of our study population had hyperthyroidism who presented with AF.

About 90% of patients with AF had symptoms. Interestingly, palpitation was not necessarily the common symptom which occurred in 39.1% of patients. Dyspnea, fatigue, palpitation and dizziness were more frequently reported,because symptoms predicted an adverse outcome independent of underlying cardiovascular disease[26]. There is a need to consider the clinical significance of symptoms associated with AF, besides their relevance to quality of life.

AF is diagnosed on an ECG, an investigation performed routinely whenever an irregular heart beat is suspected. Characteristic findings are the absence of P waves and irregular R-R intervals due to irregular conduction of impulses to the ventricles [27].Patients maynot always present with tachycardia since 51.6% of our patients had heart rate <100 bpm. Wide QRS complexes are worrisome for ventricular tachycardia. About 11.6% of our study population had wide QRS complexes in the form of either RBBB or LBBB.In general, transthoracic echocardiogram (TTE) is performed in newly diagnosed AF, as well as if there is a major change in the patient's clinical state. This may help to identify valvular heart disease, left atrial size, left ventricular size and function, presence of left atrial thrombus, presence of left ventricular hypertrophy and pericardial disease[27]. Significant enlargement of both the left and right atria is associated with long-standing atrial fibrillation. Majority of our patients had non valvular AF(81.66%), left ventricular dysfunction and dilated left atrium (90%) based on echocardiography.

Anticoagulation therapy has been shown to reduce AF-related mortality[28]. Despite this, a proportion of AF patients (up to ~50 per cent) receive sub-optimal treatment[29]. The risk of stroke is independent of the pattern of AF but is dependent upon stroke risk factors.

CHADS2 score is the widely used stroke risk score system. Based on the CHA2DS2 score, patients with a score of ≥ 2 should receive an oral anticoagulant (OAC). Patients with a score of 1 should receive antithrombotic therapy with an OAC or aspirin and patients with a score of 0 should receive either aspirin or no anticoagulant. In our study, the percentage of patients with CHADS2 scores ≥2, who had clear-cut indications for OAC therapy, was 39.1% but only 18.9 % patients received it.Patients with AF and rheumatic mitral valve disease have a high risk of stroke, and OACs are indicated30. Out of 44(18.33%) with rheumatic heart disease and AF, only 10(22.7%) patients were receiving OAC. This shows that there was a marked underuse of OACs in our population with valvular as well as non valvular AF.The reasons for under-treatment are complex but include lack of knowledge about trials/ guidelines, perceived potential contraindications, fear of bleeding, poor drug compliance, cost and inconvenience of monitoring. This clearly indicates the inadequate implementation of this highly effective therapy amongpatients with AF at high risk for strokeand there is a need to identify and address the barriers to anticoagulationuse from this rural part of Nepal.

This study has some limitations. It is not a representative

study of all geographicalregions of Nepal. This is a single institution based small study representing a rural part of Nepal. Definitely, a larger study would be needed.

Conclusion

This study provides insight about AF regarding current trends in the use of antithrombotic agents andstroke risk profile of our population. More than one third of all patients with AF qualified for the use of OACs but OACs were inadequately used. In this respect, ourfindings highlight the need for improved treatments of underlying risk factors to prevent the onset of AF and adequate use of OACs to prevent stroke risk. In particular, improved awareness among treating physicians and specialized anticoagulation clinics even at underprivileged area of our country may make it easierto initiate and maintain safe warfarin therapy. Subsequently, it will minimize the personal, societal, and financial burden of preventable strokes in patients with AF.

Conflict of interests: None declared.

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