

Clinical and Echocardiographic Profile of Patients with Atrial Fibrillation Presenting in Tertiary Centre of Nepal

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ABSTRACT

BACKGROUND

Atrial Fibrillation (AF) is one of the commonest arrhythmias with significant morbidity and mortality where there is uncoordinated activation of atrium leading to mechanical dysfunction of heart. Though rheumatic heart disease is very rare in the western world, it is still prevalent in developing country like Nepal. There is increased risk of development of heart failure, transient ischemic attack/stroke with increased rates of hospitalization.

METHODS

This study was a descriptive cross sectional study done in 70 admitted cases of two tertiary centres of Kathmandu (Bir Hospital and Sahid Ganganal National Heart Centre) from February 2018 to August 2018, presenting with history and clinical examination suggestive of Atrial Fibrillation and diagnosis confirmed by 12 lead ECG.

RESULTS

Among 70 cases, female to male ratio was 2.2:1. The mean age of patients was 60.03 ± 19.60 years with dyspnea (91%) followed by palpitation (76%) being commonest presenting symptoms. 15% of cases presented with Stroke. The most common etiology was rheumatic Heart Disease (38.6%) with female predominance. The most common valvular involvement was of mitral valve (71.4%). 8.6% of patients had clots in Left Atrium and majority had LA size >4 cm.

CONCLUSION

In contrary to the studies in the western world, the most common etiology of AF is rheumatic Heart Disease with patients of younger age group with female predominance. Majority of the cases had structural abnormalities in echocardiographic study and left atrial enlargement was common finding risking for thrombus formation and embolization.

KEY WORDS

Atrial fibrillation; Rheumatic Heart Disease; Echocardiography.

BACKGROUND

Atrial Fibrillation is the most common sustained arrhythmia with significant morbidity and mortality. It is a supraventricular arrhythmia characterized electrocardiographically by low amplitude base line oscillations (fibrillatory f waves) and an irregular ventricular rhythm. The electrical activity suggestive of P waves may be seen in some leads. However distinct p wave is absent.

In many cases, the patients may not complain of significant symptoms. However AF may present as pounding heart (palpitations), chest pain, dyspnea, dizziness, lightheadedness or syncopal attacks. There is significant risks of developing stroke heart failure, hospitalization and death.¹

The lifetime risks of developing AF is 25% in men and

women 40 years of age and older.

The lifetime risks not considering congestive cardiac failure or myocardial infarction is around 16% for both men and women.² Men are more likely than women to have atrial fibrillation regardless of age, and among older adults the prevalence is higher in white than in black populations.¹ Various studies done in different parts of the world shows the advancing age being the major risk factor for developing AF.³ There is a rise in incidence and prevalence of AF resulting in increase in global burden of AF and thromboembolic complications resulting in stroke episodes.⁴

Chronic diseases associated with AF includes hypertensive

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heart disease⁵, coronary artery disease⁶, rheumatic heart disease⁷, valvular heart disease⁸, heart failure⁹, congenital heart disease including atrial septal defect¹⁰, Ebstein anomaly, patent ductus arteriosus.

Subclinical markers indicating increased AF risk include increased arterial stiffness¹¹ and echocardiography evidence of structural heart disease such as left atrial enlargement, left ventricular hypertrophy, and left ventricular systolic and diastolic dysfunction.¹²

METHODOLOGY

This study was a descriptive, cross-sectional study done in 70 patients admitted in two tertiary centres of Kathmandu (Bir Hospital and Shahid Gangalal National Heart Centre). Patients presenting with history and clinical examination suggestive of AF and diagnosis confirmed by 12 lead ECG was included in the study. Every patient was evaluated with transthoracic echocardiography according to standard methods. Left atrial diameter was measured from M mode or 2 dimensional electrocardiography in parasternal long axis. All the statistical analysis were done from SPSS 20 software.

RESULTS

Table 1: Baseline characteristics of patients

Age (years) <20	2(2.9%)
20-39	12(17.1)
40-59	18(25.7)
>60	38(54.3)
Sex	
Female	48(69%)
Male	22(31%)
Hypertension	24.3%
Alcohol consumption	21.4%
Diabetes	8.6%
Thyroid disorder	5.7%

Table:2 Age Distribution in Patients with AF

Age group(year)	Frequency(n=70)	Percentage
< 20	2	2.9
20-39	12	17.1
40-59	18	25.7
60-79	26	37.1
> 80	12	17.1
Total	70	100.0

Sex Distribution in Patients with AF

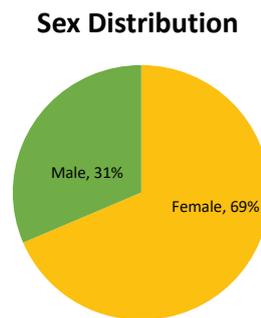


Fig 1: Sex Distribution in Patients with AF

Table:3 Presenting Complaints of AF

Dyspnea	91.0%
Palpitation	76%
Weakness/Fatigue	68%
Chest discomfort	25%
Stroke/TIA	15%
Syncope	5.0%

Most of the patients in our study had symptoms of Dyspnea (91%) followed by palpitation (76%). 64% of patients presented with symptoms of heart failure, 25% presented with chest pain, 18% of cases had features of Lightheadedness, 5% cases presented with syncopal attack. Similarly 15% of cases presented with TIA/Stroke symptoms. None of the patients were asymptomatic.

Relationship of Atrial fibrillation with left Atrial Size

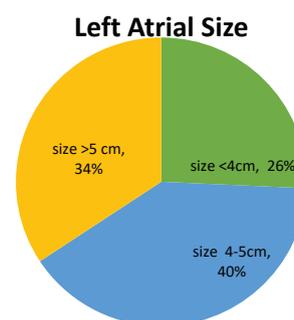


Fig 2: Pie Chart Showing Left Atrial Size in patients with AF

Mean LA size was 4.93±1.62 cm. Size ranged from 2.3 cm – 11.5 cm. Among them, 40% of cases had LA size of 4-5 cm, 34% had size more than 5 cm and 26% had size less than 4 cm.

Table 4 Etiology of Atrial Fibrillation

Etiology	Frequency	Percentage
Rheumatic Heart Disease	27	38.6
Coronary Artery Disease	6	8.6
Hypertensive Heart Disease	5	7.1
Cardiomyopathy	9	12.9
COPD/ Corpulmonale	11	15.7
Thyrotoxicosis	3	4.3
Valvular Heart Disease (Degenerative)	8	11.4
Mitral Valve prolapse	1	1.4
Total	70	100.0

The most common etiology of AF in our study was Rheumatic Heart Disease (38.6%). Among them 70.37% were female and 29.62% were male. Similarly the next common etiology in our study was COPD/ corpulmonale (15.7%), cardiomyopathy (12.9%), degenerative valvular heart disease (11.4%), coronary artery disease (8.6%), hypertensive heart disease (7.1%), thyrotoxicosis (4.3%) and mitral valve prolapse (1.4%).

Table 5: Valvular Involvement in AF

Valvular Involvement		
	Frequency	Percent
No valvular Lesion	8	11.4
Mitral Stenosis(MS)	11	15.7
Mitral Regurgitation(MR)	28	40
Aortic Stenosis(AS)	1	1.4
Aortic Regurgitation(AR)	2	3
Tricuspid Regurgitation(TR)	9	13
Mixed Lesion(MS,MR)	8	11.4
Mixed lesion (mitral and Aortic)	3	4.2
Total	70	100.0

The most common valvular involvement in our study was of Mitral valve (71.4%). Among them 15.6% were isolated Mitral Stenosis (MS), 40% were isolated MR. However 11.4% of cases has no valvular involvement which included cases of Thyrotoxicosis, Hypertension, CAD and COPD. Among RHD, 96% of the cases had Mitral valve involvement.

DISCUSSION

A total of 70 cases diagnosed as atrial fibrillation was studied from 2 different tertiary level hospitals in Kathmandu. Among them 69% were Female and 31% were Male. The ratio of Female to male was 2.2:1. This resembles the study performed by Gautam et al in Tertiary level Hospital of Nepal.¹³ Similar findings was seen in studies

done by Singh R et al¹⁴, Sastry K et al¹⁵. This findings differ from few studies where there is male predominance of Atrial Fibrillation.¹⁶⁻¹⁸

The mean age of patients presenting with AF was 60.03 ± 19.60 years with median years of presentation being 62 years and age range from 18-90 years. Majority (54.2%) of patients were above 60 years. The results of our study was in accordance to Singh R et al¹⁴ and Dhungana SP et al¹⁹ where majority of patients were older. The population prevalence of AF ranges from 2.3-3.4% and incidence being on a rising trend.²⁰ The incidence rate in overall is 9.9/1000 person-year with 1.1/1000 person-year in age group 55-59 years and rising to 20.7/1000 person year in a age group 85 years and above.²¹

Most of the patients in our study had symptoms of dyspnea (91%) followed by palpitation (76%). 64% of patients presented with symptoms of heart failure, 25% presented with chest pain, 18% of cases had features of Lightheadedness, 5% cases presented with syncopal attack. Similarly 15% of cases presented with TIA/Stroke symptoms. None of the patients were asymptomatic.

Hemodynamic consequences of AF may be due to variable combination of suboptimal ventricular rate control or loss of coordinated atrial contraction, beat to beat variability in ventricular filling and activation of autonomic nervous system.^{22,23}

Presentation of patients therefore ranges from no symptoms to fatigue, palpitations, dyspnea, hypotension, syncope, or heart failure.²⁴ Many times AF is associated with exacerbation of underlying heart disease, either because AF is a cause or consequence of deterioration or because it contributes directly to deterioration.^{25,26} Hypertensive heart disease and coronary heart disease are the commonest chronic disorders associated with atrial fibrillation in the developed countries.²⁷ It is estimated that hypertension is responsible for 14% of all cases of AF.²⁸

In our study, 24.3% of patients were hypertensive, 21.4% had history of alcohol consumption, 8.6% were Diabetic, 5.7% patients had thyrotoxicosis. Different studies have shown atrial fibrillation being associated with chronic disease condition like Diabetes Mellitus¹. Similarly other triggers include acute alcohol consumption/alcohol abuse. Binge alcohol drinkers with or without alcoholic cardiomyopathy are at increased risk of developing AF mostly triggered during weekend, where there is increased alcohol intake, a phenomenon known as holiday heart syndrome.²⁹

The most common etiology of AF in our study was rheumatic heart disease (38.6%). Among them 70.3% were female and 29.7% were male. As RHD is common in areas with low socioeconomic backgrounds, overcrowding

and high prevalence of throat infection with Group A beta hemolytic streptococci, it is more endemic in Asia, Africa and South America.³⁰ The result of our study is consistent with the prevalence study done by Adhikari K et al in tertiary hospital of Kathmandu where 37.14% of the patients who had AF was diagnosed with RHD.

Majority of patients in our study had left atrial size more than 4 cm. Among them, 40% of cases had LA size of 4-5 cm, 34% had size more than 5 cm and only 26% had size less than 4 cm. Atrial size is further increased if AF is sustained.³¹ LA dilatation is associated with adverse remodeling of its wall, but debate arises whether AF is the initial cause or in fact the end result.³² Left atrial dimension more than 6 cm has greater chance of recurrence of AF.³³ 8.6% of patients in our study had clots in Left Atrium.

AF increases the risk of stroke five times.³⁴ Around 20% of all cases of stroke are related to thromboembolism secondary to Atrial Fibrillation.³⁵ It is very important to decide about the use of oral anticoagulation or aspirin in case of AF for prevention of embolic episodes based on CHADS VAS score where score of >1 favours oral anticoagulant use to prevent embolization in non valvular AF.³⁶

The most common valvular involvement in our study was of Mitral valve (71.4%). Among them 15.6% were isolated Mitral Stenosis (MS), 40% were isolated mitral regurgitation (MR). However 11.4% of cases has no valvular involvement which included cases of thyrotoxicosis, hypertension, coronary artery disease and COPD. Among RHD, 96% of the cases had Mitral valve involvement.

Although any valvular lesion can predispose to AF, stenotic left sided lesion, particularly rheumatic heart disease has highest prevalence.⁷

LIMITATION

Since this is a hospital based study, it may not represent the real picture prevalent in the community setting. Though Sample size is small, it may be a base for further studies regarding AF.

CONCLUSION

Atrial Fibrillation is one of the commonest sustained arrhythmias with significant morbidity and mortality. This study has given basic clinical and echocardiographic profile of patients with AF. In contrary to the studies in the western world, the most common etiology of AF is Rheumatic Heart Disease with patients of younger age group with female predominance. Left atrial enlargement is frequently observed risk for thrombus formation and systemic embolisation.

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