

Research Article

## Clinical and Etiological Profile of Patients with Atrial Fibrillation (AF): Analysis and implications

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### ABSTRACT

**Background and Objectives:** Atrial fibrillation (AF) is a frequently encountered cardiac arrhythmia which may be either symptomatic or asymptomatic. So, this study was conducted to know clinical presentation and to find out possible clinical and etiological profile of patients with AF .

**Material and Methods:** This cross sectional study was conducted at Osh Regional Integrated Clinical Hospital, Osh Territorial City Clinical Hospital, The Kyrgyz Republic in collaboration with Janaki Medical College Teaching Hospital, Janakpur, Nepal. Sixty consecutive patients with AF were taken. Presenting complaints, past history, personal history was recorded. A thorough clinical examination was done, electrocardiogram, chest X-Ray postero-anterior view, echocardiogram, thyroid function test and relevant test were done and analyzed.

**Results:** Forty percent of the patients complained palpitation. Systemic thrombo-embolism was found in 15% of the patients. Other presenting complaints were cough, chest pain, shortness of breath, dizziness, swelling of the legs, tremors. Eighteen percent of patients presented with features of congestive cardiac failure and 30% of the patients gave history of rheumatic heart disease, 16.6% and 11.6% hypertension and ischemic heart disease respectively. Etiology-wise, rheumatic heart disease was the most common (46.6%) followed by hypertension (21.6%), ischemic heart disease (11.6%), dilated cardiomyopathy (6.6%), hyperthyroidism (5%), pneumonia (5%).

**Conclusion:** Rheumatic heart disease, especially mitral stenosis is the most common cause of AF in this study. Systemic hypertension was next common etiology of AF, followed by ischaemic heart disease, dilated cardiomyopathy, thyroid disease. Heart failure, Systemic thromboembolism, decreased exercise tolerance are a major determinants for development of significant morbidity and mortality.

**Key Words:** Atrial fibrillation, cardiac arrhythmia, IHD, Rheumatic Heart disease

### INTRODUCTION

Atrial fibrillation (AF) is a frequently encountered cardiac arrhythmia. The overall chance of AF developing over a period of two

decades in patients older than 30 years, according to Framingham data, is 2 percent. Approximately 4% of the population over age 60 years has sustained AF, with a particularly

steep increase in prevalence after the seventh decade of life [1-2]. The most powerful predictor for risk of this arrhythmia in the past was rheumatic heart disease, but since this diagnosis is rare in developed countries, it accounts for only a small number of cases [3]. A history of congestive heart failure, valvular heart disease and stroke, left atrial enlargement, abnormal mitral or aortic valve function, treated systemic hypertension, and advanced age was independently associated with the prevalence of AF [4]. But in an Indian studies common etiology of AF is rheumatic heart disease [5]. So, younger people with rheumatic heart disease are also vulnerable for development of this arrhythmia in developing countries.

Atrial Fibrillation may be symptomatic or asymptomatic. Though symptomatic AF is more common, a patient's description and tolerance of AF may vary depending on ventricular rate and regularity, the presence of other cardiac disease, and other medical conditions [6]. Perhaps the most common symptom of AF is the sense of a rapid heartbeat or palpitations, which may occur at rest or only after exercise or stress. Dyspnea, fatigue, presyncope, and dizziness are not uncommon. Additionally, chest pain, symptoms of worsening CHF, and symptoms associated with embolism, especially stroke, may be presenting features. So, this study was planned to know clinical presentation and to find out possible clinical and etiological profile of patients with AF.

## **MATERIALS AND METHODS**

This study was carried out during period of March 2012 to August 2012 in Osh Regional Integrated Clinical Hospital, Osh Territorial City Clinical Hospital, The Kyrgyz Republic in collaboration with Janaki Medical College

Teaching Hospital, Janakpurdham, Nepal. Clinical profile, thyroid function test, chest radiograph, electrocardiogram and echocardiography of patients with AF were taken following standard procedure of hospital. Patients enrolled in study were those visiting outpatient departments, emergency and admitted in wards.

A 12-lead surface electrocardiogram was obtained from each patient and analyzed [4, 7-8]. Chest X-ray postero-anterior view was taken in each case and studies for presence of any abnormality. Criteria for abnormalities were as discussed elsewhere [9].

Transthoracic echocardiogram by M-mode, 2-dimensional and doppler echocardiography were done by first author using conventional method and measurements were taken according to recommendation of American society of echocardiography [10]. Two-dimensional echocardiographic views were obtained and nomenclature and image orientation was according to the American society of echocardiography [11]. Serum  $fT_3$ ,  $fT_4$ , TSH was measured in all patients except in patients with rheumatic heart disease. Hormonal assay was performed by Serozyme technology, BioChem Immuno Systems Italia S.P.A. made in Italy. Mean and standard deviation were obtained by using SPSS 20.0 for windows.

## **RESULTS**

The mean age of the study group was  $47.77 \pm 19.05$  (means $\pm$ 1 standard deviation). The age and sex distribution of the patient are shown in table 1. Out of total number 60, numbers of female were 33(55%) and numbers of male were 27(45%). Patients of the atrial fibrillation were presented with the features presented in Table 2.

**Table 1: Age group and sex wise distribution of patients (N=60)**

Age group	Male	Female	Total
15-20 years	1	3	4
21-30 years	4	5	9
31-40 years	3	9	12
41-50 years	4	4	8
51-60 years	5	4	9
61-70 years	6	4	10
71-80 years	3	3	6
>80 years	1	1	2
<b>Total</b>	<b>27</b>	<b>33</b>	<b>60</b>

**Table 2: Clinical presentation of the patients (N=60)**

S. N.	Clinical Presentation	Number of Patients	Percentage
1.	Palpitation	24	40%
2.	Cough	18	30%
3.	Tremor	16	26.6%
4.	Abdominal Pain	15	25%
5.	Leg Swelling	14	23.3%
6.	Dizziness	14	23.3%
7.	Chest Pain	13	21.6%
8.	Dyspnea	12	20%
9.	Sputum Production	12	20%
10.	Others	12	20%
11.	Excessive Sweating	11	18.3%
12.	Orthopnea	9	15%
13.	Thromboembolism	9	15%
14.	Orthopnea	7	11.6%
15.	Weight Loss	6	10%
16.	Heat Intolerance	5	8.3%
17.	PND	3	5%
18.	Haemoptysis	3	5%

**Table 3: Past history of the patients**

History	Number (%)
RHD	18(30%)
IHD	7(11.6%)
Hypertension	10(16.6%)
Diabetes	10(16.6%)
Hyperthyroidism	0(0%)

Table 3 depicts the past history of the patient whereas table 4, 5, 6 and 7 shows the detail of

chest-x-ray, ECG and Echocardiographic findings and Echochardiographic impression respectively.

**Table 4: Chest X - ray findings of the patients (N=60)**

Chest X-Ray findings	Number of patients	Percentage
No Cardiomegaly	10	16.6%
Evidence of LA Enlargement	24	40%
LV Enlargement	14	23.3%
RV Enlargement	18	30%
Prominent pulmonary conus	22	36.6%
Biventricular Enlargement	13	21.6%
Consolidation of Pneumonitis	14	23.3%

CXR = Chest X-Ray, LA = Left atrium, LV = Left ventricle, RV = Right ventricle

**Table 5: Showing electrocardiographic findings of the patients (N=60)**

ECG findings	Number of patients	Percentage
LA abnormality	32	53.3%
LV enlargement	18	30%
RV enlargement	8	13.3%
Left bundle branch block	7	11.6%
Left anterior hemi block	5	8.3%
Left posterior hemi block	2	3.3%
Non-specific conduction block	5	8.3%
Significant ST-Twave abnormality	10	16.6%
Abnormal Q Waves	5	8.3%

After analysis of history, clinical examination and study of ECG, chest X-ray, echocardiogram and thyroid function test, probable etiologies of atrial fibrillation are identified as: RHD in 28(46.66%); Hypertension in 13(21.66%); IHD in 7(11.66%); DCM in 4(6.66%); Thyrotoxicosis in 3(5%); pneumonia in 3(5%); cause undetermined in 2(3.33%) patients (figure 1)

**Table 6: Trans - thoracic echocardiographic findings of the patients (N=60)**

Echocardiographic findings	Number of patients	Percentage
<b>Left atrial size</b>		
Normal (<4.0cm)	18	30%
Mild enlargement (4.1-4.5cm)	12	20%
Moderate enlargement (4.6-5.5cm)	13	21.6%
Severe enlargement (>5.5 cm)	17	28.3%
<b>Mitral valve abnormality</b>		
Thickening	26	43.3%
Stenosis	24	40%
Regurgitation (>2+/4+)	12	20%
Mitral annular calcification	6	10%
Prolapse	2	3.3%
<b>LV hypertrophy/dilatation</b>	22	36.6%
<b>RV and RA</b>		
a) Normal	26	43.3%
b) Dilatation / Hypertrophy	24	40%
<b>Pulmonary arterial pressure</b>		
a) Normal	28	46.66%
b) Raised	32	53.3%
<b>LV ejection fraction</b>		
a)>50%	45	75%
b)40-49%	8	13.3%
c)30-39%	4	6.6%
d)<30%	3	5%
<b>LV wall motion abnormality</b>		
a) Global	3	5%
b) Regional	9	15%
<b>Diastolic dysfunction</b>	22	36.6%

**Table 7: Echocardiographic impression of the patients (N=60)**

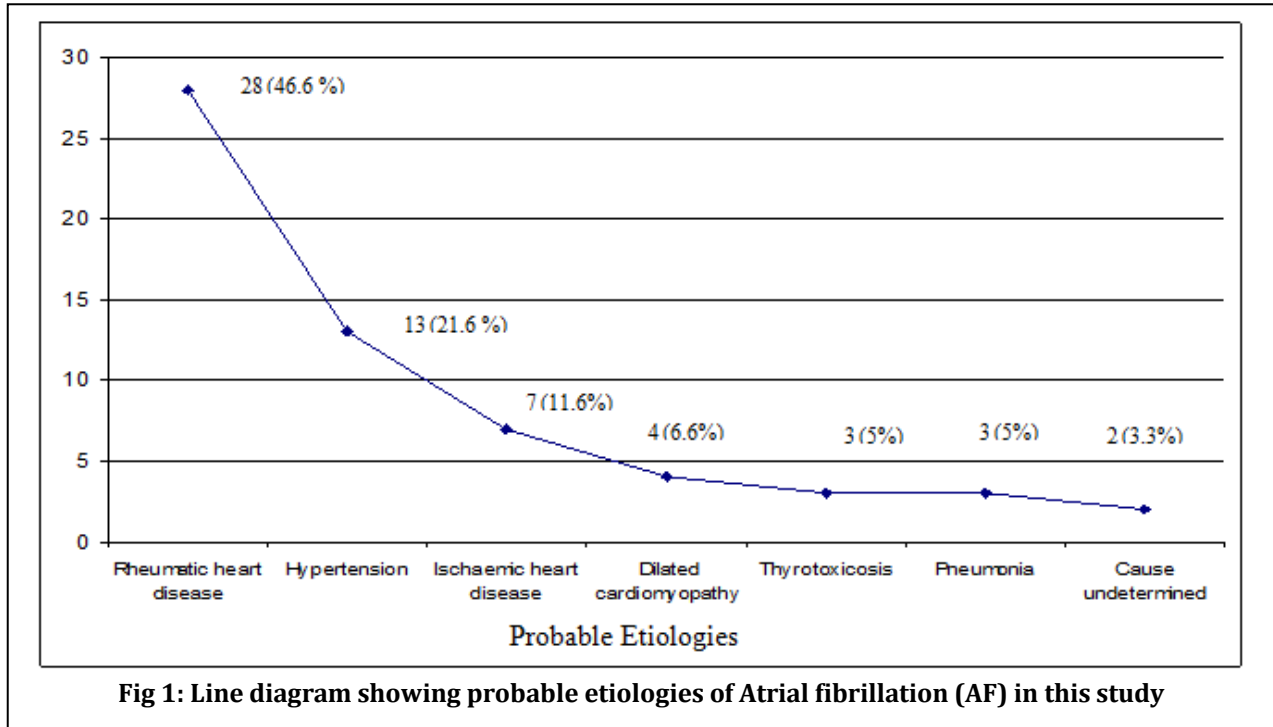
Impression	No of cases	Percentage
Rheumatic heart disease	28	46.66
Ischaemic heart disease	7	11.6
Concentric LV hypertrophy	11	18.33
Dilated cardiomyopathy	3	5
Cor pulmonale	6	10
No significant finding	5	8.33

## DISCUSSION

The mean age of the patients in this study was  $54.68 \pm 17.48$  years which was slightly less than that of patients enrolled in AFFIRM study [12], with the mean age of  $69.7 \pm 9.0$ . In study by Gурpal Singh et al mean age was 51.68 years [5]. In another study of prevalence and management of AF Stewart FM et. al [13], mean age of the patients was 76 years.

A review of four population-based surveys showed the median age of patients with AF was 75. The prevalence of AF was 2.3% among people over 40 years of age, but 5.9% among people over age 65 [14]. In addition, the surveys revealed that 70% of all people with AF are between 65 to 85 years old. Age distribution of patient shows highest number of patients in 31-40 years age group in this study but in developed countries AF is more common in older age group [14]. Explanation can be high incidence and prevalence of rheumatic fever in developing country like Nepal. Total number of male was 27(45%) while numbers of female were 33(55%). In this study there is female prepondance as it was seen in study done by Gурpal Singh et al [3] in which among 66 patients, 31 (47%) were male; 35 (53%) were females. In study of Stewart et al [13] among one hundred and forty-seven patients there were 52% male and 48% female with mean age 76 years.

Very limited data are available on clinical presentation of the condition for comparison with this study. Palpitation was commonest presenting complaint found in 24 (40%) out of 60 patients. In CARAF registry, palpitation was noted in as much as 50% of the patients. It was more in patients with rapid ventricular response and new onset AF [15]. Second common symptom was cough, found in



18(30%) of the patients of this study. This includes cough related with pulmonary congestion due to elevated left atrial pressure secondary to mitral valve disease, heart failure, and respiratory tract infection. Infectious aetiology was indicated by presence of pluritic type chest pain, of purulent sputum, and pneumonitis or consolidation in chest radiograph. In 20% of the patients cough was productive, in about half of those sputum was purulent. Pneumonitis or consolidation was noted in 14(23.3%) patients in chest radiograph study. Study by Stewart et al among 147 patients CAF, cause of admission was pneumonia in 17 % cases. [13].

The fine postural tremor was found in 16(26.6%) out of 60 patients. These might have included exaggerated physiological tremor with advancing age. Abdominal pain was found in 15(25%) patients. In most of them pain was epigastric in location and burning type without any radiation. This included pain resulting from congestion

secondary to right heart failure and concomitant acid peptic disease. Dizziness was found in 14(23.3%) patients. In CARAF registry dizziness was found in 25% of the patients [15]. Leg swelling was present in 14(23.3%) patients. In this group of patient there were other features of right heart failure. Chest pain was presenting complaint in 13(21.6%) patients. 10(16.6%) of them gave, retro-sternal pressing type of chest pain which was aggravated by exertion. Rest of 3 patients gave history of typical pluritic type, which was made worse on coughing and deep breathing. Dyspnea was noted in 12(20%) patients. It used to get aggravated by exertion. 7(11.6%) of them gave history suggestive of orthopnea and 3(5%) gave history of paroxysmal nocturnal dyspnea. In CARAF registry dyspnea was found in less than 20% of the patients [15].

Systemic thromboembolism has received most attention regarding clinical outcome of the AF. Systemic thromboembolism was noted in 9(15%) patients. Six of them had

hemiplegia with suggestive ischaemic changes in middle cerebral artery territory in CT scan of head. In 2 patients, CT scan was normal. Out of total 9 patients, 4 had rheumatic heart disease, 3 had hypertension, one had biventricular heart failure. Among 9 patients 3 were receiving aspirin but none of them were on warfarin. Although sample size was small there was no thromboembolism in warfarin group. A number of trials have reported an association between clinical parameters and the risk of stroke in AF patients [16]. The thromboembolism rate was 1%, when no risk factors were present, 6.0% when one or two factors were present and 18.6% when three or more were present. Excessive sweating was found in 11(18.3%) patients. There was weight loss in 6(10%) patients despite average appetite. 5(8.3%) patients volunteered heat intolerance. In treatment history, aspirin was the most frequently used drug 25(41.6%), followed by antiarrhythmic drug 22(36.6%). Warfarin was used in 7(11.6%).

In this study, etiologically rheumatic heart disease was most common seen in 28(46.66%) out of 60 patients. In study done by Gural Singh RHD was found in 37.8% [5]. There are only a few western literatures relating rheumatic heart disease and AF. This may be due to relatively low prevalence of rheumatic heart disease in developed countries [1-2]. Next common etiology was hypertension that was found in 13(12.6%) patients. Mean left atrial size in these patients was  $5.21 \pm 0.32$ . Hypertension was found in 13.63% patients in Singh's study [5]. In a study of Kannel WB et.al, hypertension was found in 45% of the patients with AF [17]. In AFFIRM study, out of 4060 patients enrolled, 51% were hypertensives [12].

Ischemic heart disease was next common etiology noted. This entity was determined by presence of abnormal Q waves, T wave inversion, a new onset bundle branch block in absence of other likely explanation, wall motion abnormality in two-dimensional echocardiogram. In this study ischaemic heart disease was found as 7(11.6%) of the patients. Two of the 7 patients were admitted with the diagnosis of acute myocardial infarction. In Singh et.al study, IHD was found in 3.3% patients [5]. Among patients enrolled in AFFIRM study coronary artery disease was present in 26% [12]. In the study of Stewart et.al ischaemic heart disease was found in 11% of the patients admitted with AF [13]. Approximately 25% of patients with AF have coronary artery disease as an antecedent diagnosis [17].

Dilated cardio-myopathy (DCM) was seen in 4(6.6%) of the patients. Diagnostic criteria for dilated cardio-myopathy was adopted as left ventricular ejection fraction  $<40\%$ ,  $LVEDD > 112\%$  of predicted and fractional shortening  $<25\%$ . According to Singh et.al [5], DCM was found in 22.72% patients. In AFFIRM study cardio-myopathy was predominant diagnosis in 5% of the patients [12].

Thyrotoxicosis was found in 3(5%) of the patients in this study. Other clinical features present in these patients, were heat intolerance, tremor, warm and moist palms. In Gural Singh et.al, Thyrotoxicosis was found in 9.09% of the patients. Krahn AD et.al stated that thyroid disease is an unusual and sometimes overlooked cause of AF, occurring in about 2% of patients [18].

In 3(5%) patients Pneumonia was the associated condition with AF in this study. In Stewart et.al study, pneumonia was the cause for admission in 17% of the patients [13].

Similarly, in 2(3.3%) patients no cause was found. In Gurpal Singh et.al 1.5% patients were reported as lone AF [5].

## CONCLUSION

AF was commonly seen in females. About 1/3<sup>rd</sup> of the cases had past history of RHD, other risk factors were hypertension, IHD, DCM, hyperthyroidism, pneumonia. Left atrial enlargement was commonest Echo cardiographic findings.

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## AUTHOR'S CONTRIBUTION:

**RNM-** Data collection, drafting first draft of manuscript, data analysis and final approval;

**AKM-** Data collection, revision of first draft;

**ELM-** Intellectual discussions and revision of final manuscript prepared.

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