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Original Research Article

A Clinical and Echocardiographic Assessment of Patients with Atrial Fibrillation: An Observational Study

Mani Shankar Pandey

Consultant, Department of Cardiology, Ruban Memorial Hospital, Patna, Bihar, India

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Corresponding Author: Dr. Mani Shankar Pandey
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Abstract

Aim: The aim of the present study was to assess the clinical and echocardiographic assessment of patients with atrial fibrillation.

Methods: The present study was conducted in the Department of Cardiology for 15 months. 100 patients were included in this study.

Results: The most common symptom was dyspnoea 76% followed by Congestive cardiac failure 71%. There was history of mild to moderate chest pain in 13% of patients. 18% of patients had history of syncope/dizzy spells. Fatigability was noticed in 21% cases. There were 55% males and 45% females in this group. Majority of patients, 55% had RHD as underlying cause of atrial fibrillation. 9% patients had coronary artery disease. Hypertension alone was present in 7% of patients. 9% of patients had COPD as a risk factor. 8% of patients had cardiomyopathy Hyperthyroidism was found in 3% of patients. 70% patients had heart rates >100. Fibrillary P wave was seen in 22% patients and absent p waves in 78% of patients. LVH was seen in 11% patients, RVH in 30% patients, RBBB in 4% patients, and LBBB in 5% patients, ST depression and T wave inversion in 58% patients. The maximum number of patients i.e. 37% had LA dimension between 4.1-5.0 cm^2.

Conclusion: In our study dyspnoea was the commonest symptom in atrial fibrillation and rheumatic heart disease was the major aetiological factor. Patient with left atrial dimension >4.0 cm had sustained atrial fibrillation. Thromboembolic phenomenon was more common in chronic AF and all the patients had mitral valve disease.

Keywords: cardiomyopathy, atrial fibrillation, rheumatic heart disease

Introduction

Atrial fibrillation (AF) is a common supraventricular tachyarrhythmia affecting 1% to 2% of the general population. [1] The risk of AF generally increases with aging, hypertension, coronary artery disease, diabetes mellitus, alcohol use. [2,3] However, the valvular disease is the most common substrate for AF in areas with a high prevalence of rheumatic heart disease and is a risk factor for embolic stroke and heart failure. [4,5]

The cardiac remodeling that occurs in response to various causes tends to increase the left atrial pressure and size and alter wall stress creating a substrate to cause AF. [6-8] The enlarged left atrium (LA) has been correlated with AF occurrence and cardiovascular events. [9,10] The left ventricular ejection fraction (LVEF) is also associated with AF development and its consequences. [11,12] Electrocardiographic risk factors include left axis deviation, left ventricular hypertrophy, ischemic changes and Echocardiographic risk factors include left atrial enlargement, increased left ventricular wall thickness and decreased left ventricular fractional shortening. Various common complications associated with Atrial Fibrillation include Congestive cardiac failure. At rest approximately 20% of left ventricular stroke volume is by atrial contraction which will be lost in AF and hence LV dysfunction can occur. [13] The most common complication in AF is thromboembolism induced stroke. AF is associated with 5 fold increased risk of stroke than in unaffected population. Older patients are not only more prone to AF but their risk of stroke is considerably increased as compared to younger patients with AF. [14]

The aim of the present study was to assess the clinical and echocardiographic assessment of patients with atrial fibrillation.

Materials and Methods

The present study was conducted in the Department of Cardiology, Ruban Memorial Hospital, Patna, Bihar, India for 15 months. 100 patients were included in this study.

All patients were requested to participate and after taking consent they were investigated historically

and clinically to find out cause and complication of atrial fibrillation as per semi structured question. The patients were screened for the underlying causes, leading to AF and correlated clinically and echocardiographically. Detailed history was recorded in each case paying special attention to history regarding symptoms of AF like palpitation, chest pain, dyspnoea, orthopnoea, paroxysmal nocturnal dyspnoea, sweating, nausea and vomiting, cough, fever, haemoptysis, dizziness, syncope, weakness, easy fatigability, neurodeficit, sudden blindness, tremors smoking and alcohol intake. A detailed history was also taken regarding the presence of other co-morbid conditions like hypertension, rheumatic heart disease, thyrotoxicosis, chronic obstructive pulmonary disease, old stroke, coronary artery disease and re-recurrent congestive heart failure. A complete physical, systemic and laboratory examination was done on each patient. A detailed systemic examination was done with special emphasis on cardiovascular system - examination. Echocardiography was performed on AF patients by an experienced cardiologist.

Results

Table 1: Demographic data and various Mode of Presentation of Patients with Atrial Fibrillation

Symptoms	No. of patients	Percentage
Dyspnoea NYHA Class II – IV)	76	76
Congestive cardiac failure	71	71
Palpitation	59	59
Fatigue	21	21
Syncope/ Dizzy spells	18	18
None	15	15
Chest pain	13	13
Gender		
Male	55	55
Female	45	45

The most common symptom was dyspnoea 76% followed by Congestive cardiac failure 71%. There was history of mild to moderate chest pain in 13% of patients. 18% of patients had history of syncope/dizzy spells. Fatigability was noticed in 21% cases. There were 55% males and 45% females in this group.

Table 2: Clinical Characteristics According to Cause of Atrial Fibrillation

Risk factors	Male	%	Female	%	Total	%
RHD	15	15	40	40	55	55
HTN (alone)	4	4	3	3	7	7
COPD	7	7	2	2	9	9
Coronary artery disease	6	6	3	3	9	9
Cardiomyopathy	6	6	2	2	8	8
Congenital heart diseases	0	0	2	2	2	2
Hyperthyroidism	0	0	3	3	3	3
Lone AF	2	2	5	5	7	7
Total	40	40	60	60	200	100

Majority of patients, 55% had RHD as underlying cause of atrial fibrillation. 9% patients had coronary artery disease. Hypertension alone was present in 7% of patients. 9% of patients had COPD as a risk factor. 8% of patients had cardiomyopathy Hyperthyroidism was found in 3% of patients.

Table 3: ECG Findings of Patients with Atrial Fibrillation

ECG findings	No. of patients	Percentage
Heart Rate -- > 100	70	70
< 100	30	30
Fibrillary waves	22	22
Absent ‘p’ waves	78	78
RBBB	4	4
LBBB	5	5
ST depression/ ‘T’ wave inversion	58	58
LVH	11	11
RVH	28	28

70% patients had heart rates >100. Fibrillary P wave was seen in 22% patients and absent p waves in 78% of patients. LVH was seen in 11% patients, RVH in 30% patients, RBBB in 4% patients, and LBBB in 5% patients, ST depression and T wave inversion in 58% patients.

Table 4: Left Atrial Dimensions

LA Dimensions	No. of patients	Percentage
< 4.0 cm^2	29	29
4.1 – 5. 0 cm^2	37	37
> 5.0 cm^2	34	34

The maximum number of patients i.e. 37% had LA dimension between 4.1-5.0 cm^2.

Discussion

Atrial Fibrillation (AF) is one of the commonest arrhythmia seen in clinical practice. The incidence is 0.5% in patients under 60 years of age and 10% in patients above the age of 80 years. In Western countries, elderly population is at risk, but in countries like India where rheumatic heart disease (RHD) is rampant, it is the commonest cause of mortality and morbidity in the young. [14] 15% of all strokes are related to AF associated with thromboembolic events. [15] Electro-physiologically, AF represents disorganized atrial depolarization that results from chronic wavelets of re-entry. The various causes of AF that have been suggested are damage to sino atrial node and internodal pathways, atrial dilatation and occlusion of the nodal artery. [16]

The most common symptom was dyspnoea 76% followed by Congestive cardiac failure 71%. There was history of mild to moderate chest pain in 13% of patients. 18% of patients had history of syncope/dizzy spells. Fatigability was noticed in 21% cases. There were 55% males and 45% females in this group. Tischler et al [17] reported dyspnoea in 62% of patients, palpitation in 33% patients, and syncope in 12% patients in a similar study. Flaker et al [18] in their study observed that 78% patients had dyspnoea and 11 % had chest pain at presentation whereas Levey et al [19] reported that 54.1% patients had palpitation, 44.4% patients had dyspnoea and 10.1% patients had chest pain. Fatigue was noted in 14.3% patients. 9% patients had coronary artery disease. Hypertension alone was present in 7% of patients. 9% of patients had COPD as a risk factor. 8% of patients had cardiomyopathy Hyperthyroidism was found in 3% of patients. In India, a study conducted by Singh et al [20] reported RHD in 37.87%, cardiomyopathy in 13.6%, HTN in 3%, IHD in 3.03%, thyrotoxicosis in 9.05% and lone fibrillation in 1.5% of their patients. Kumar et al [21] reported RHD in 39%, IHD in 29%, HTN in 54%, cardiomyopathy in 4%, COPD in 3% and thyrotoxicosis in 5% of their patients. Timane et al [22] showed RHD in 55% patients, cardiomyopathy in 11.25%, thyrotoxicosis and COPD in 8.75% each. Studies conducted by Levey et al [19] reported RHD in 15.2%, non-rheumatic valvular lesion in 3.3%, cardiomyopathy in 14%, hypertensive heart disease in 21.4%, IHD in 16.6%, thyrotoxicosis in 3.1%, and COPD in 11.2% as the various causes of atrial fibrillation. Kannel et al [23] reported RHD in 54.08% respectively and found that RHD was the most common cause of AF.

70% patients had heart rates >100. Fibrillary P wave was seen in 22% patients and absent p waves in 78% of patients. LVH was seen in 11% patients, RVH in 30% patients, RBBB in 4% patients, and LBBB in 5% patients, ST depression and T wave inversion in 58% patients. The maximum number of patients i.e. 37% had LA dimension between 4.1-5.0 cm^2. Henry et al [24] (observed if left atrial dimension exceeded 4.5 cm2, cardioversion was unlikely to be effective in the long run. Left atrial size >4.0cm2 is the single strongest predictor of increased risk of embolization Cabin et al and Blackshear et al [25,26] and according to Sandflippo et al [27] atrial size is increased in time with atrial fibrillation even in the absence of other causes of atrial enlargement. In a study done by A. Banerjee et al [28], it was seen that EF measurement alone was not helpful in predicting the risk of stroke/ Thromboembolism in patients of Non Valvular AF with Heart Failure. Presence of abnormal EF (LV systolic dysfunction) independently predicts the risk of stroke as shown by Atrial fibrillation investigators study. [29] It was observed in a study done by Mahmood ul Hassan that significant correlation was observed for LA clot in patients with AF and LA size > or = 45 mm, ($p>0.001$). Out of 1544 patients taken, the mean LA size was 43.82±2.12 mm. Atrial fibrillation was observed in 289 patients (18.7%). Overall clot was seen in 224 (14.5%) patients. Left atrial appendage clot was seen in 202 (89.73%) and LA clot was seen in 9 patients (4.02%). [30]

Conclusion

In our study dyspnoea was the commonest symptom in atrial fibrillation and rheumatic heart disease was the major aetiological factor. Patient with left atrial dimension >4.0 cm had sustained atrial fibrillation. Thromboembolic phenomenon was more common in chronic AF and all the patients had mitral valve disease.

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