

A study of clinical features and echocardiographic profile of patients with atrial fibrillationManish Kumar^{1*}, D P Singh²¹MD (Med); DTM&H (UK); FICP, Consultant Physician and Cardiologist, ARC Hospital, Bhagalpur, Bihar, India²MD, DTCD, FACP, FICP, FIAMS, FCSI, FICS, FCCP, FIACM, FRCP (Glasgow), FRCP (Edinburgh) Professor, Dept. of Respiratory Medicine, JLN MCH, Bhagalpur, Bihar, India

Received: 07-10-2020 / Revised: 29-11-2020 / Accepted: 13-12-2020

Abstract

Aim: The clinical profile and echocardiographic assessment of patients with atrial fibrillation. **Material and methods:** The present study was conducted at Arc Hospital Bhagalpur, India and Jawaharlal Nehru Medical College Hospital, Bhagalpur from Jan 2019 to December 2019. Total 200 patients were evaluated clinically, and detailed Cardiovascular, Neurological examination was done to evaluate aetiology and for any evidence of thromboembolism. Echocardiography was also done using GE Vivid series echocardiography machine. **Results:** Among the total 200 patients with Atrial Fibrillation Mean Age of the patients was 66.24±13.41 yrs and maximum were in the below 50 yrs age group (n = 175; 87.5%). Males were predominant in this study. CHA2DS2-VASc score of more than 2 was seen in 87.5% of the patients. Rheumatic heart disease was seen in 23 patients as the cause of AF. The most predominant presenting symptom was dyspnoea which was class IV in 12 patients (60%) followed by pedal edema in 75 patients (37.5%), Stroke in 41 patients (20.5%), Palpitations in 34 patients (17%), Typical Chest Pain in 11 patients (5.5%) and in 21 patients (10.5%) AF was discovered incidentally during work up of some inter-current illness. **Conclusions:** Increasing age and hypertension are associated with occurrence of AF. Hypertensive heart disease was the most common aetiology in elderly age group. Presence of LVH or left atrial enlargement in patients with hypertensive heart disease requires early management to improve the outcomes.

Keywords: Atrial fibrillation, Left atrial size, Left ventricular hypertrophy.

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Introduction

Atrial fibrillation (AF) is the most common arrhythmia in clinical practice and will continue to increase given the advancing age of the population.[1] The increased mortality and morbidity associated with this arrhythmia is widely appreciated with stroke being the most feared complication[2]. Strokes secondary to underlying AF are often fatal; those who survive may be left with more disabling neurological deficit than other forms of ischaemic stroke.

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Echocardiography plays a critical role in defining the clinical context of the arrhythmia and therefore informs the clinician regarding the key issues of anticoagulation and overall cardiac management. AF is characterized by disorganized atrial depolarizations without effective atrial contraction. The exact mechanisms of initiation are complex but any form of structural heart disease may create the underlying substrate for arrhythmia induction and its continuation. Furthermore, the presence of AF itself causes both electrical and structural changes within the atria, hence the well known phrase 'AF begets AF'. The electro-cardiographic appearances are characterized by an irregularly irregular rhythm and the absence of P waves. 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.[3] 15% of all strokes are related to AF associated with

thromboembolic events.[4] 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 sinoatrial node and internodal pathways, atrial dilatation and occlusion of the nodal artery.[5]

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Different diseases contributing to atrial fibrillation will appear at different ages, atrial fibrillation appearing because of valvular heart disease appears earlier than other diseases contributing to the development of atrial fibrillation. In this background it is pertinent to know the clinical profile and etiological factors responsible for Atrial Fibrillation and echocardiographic profile in an institute to manage the patients in the hours of Emergency.

Material and Methods

The present study was conducted at Arc Hospital Bhagalpur, India and Jawaharlal Nehru Medical College Hospital, Bhagalpur from Jan 2019 to December 2019 among 200 patients with Atrial fibrillation detected on ECG.

Inclusion criteria

Patients aged more than 18yrs and clinically and electrocardiographically proven Atrial Fibrillation cases were included in this study. It was diagnosed clinically by the presence of irregularly irregular pulse rate, pulse deficit of >10, S1 of variable intensity and by using 12 Lead ECG showing absence of P waves,

Results

presence of fibrillatory waves that vary in size, shape and timing leading to irregular ventricular response.

Exclusion criteria

Patients suspected clinically to have atrial fibrillation later proved to have different arrhythmia electrocardiographically were excluded from this study.

All the patients who were enrolled in this study were subjected to routine laboratory investigations along with Lipid Profile, Thyroid Profile, MRI 3D Brain wherever applicable and then Echocardiography was done to evaluate the etiology of AF.

Methodology

A total of 200 patients with Atrial fibrillation detected on ECG were include in this study. Patients were studied in detail with reference to age, sex, clinical features and history of present & past illness. Detailed Cardiovascular and Neurological examination was done to know the etiology and to assess for any evidence of thromboembolism.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 19 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages and means. Test applied for the analysis were chi-square test and t-test. The confidence interval and p-value were set at 95% and 5% for both the test.

Table 1: Demographic profile and various characteristics of study population

Variables	No. of patients (n)	Percentage (%)
Age (yrs)		
Below 50	25	12.5
Above 50	175	87.5
Sex		
Male	127	63.5
Female	73	36.5
Risk factors		
Hypertension	178	89
Diabetes mellitus	39	19.5
Alcohol	71	35.5
Smoking	22	11
Rheumatic heart disease	23	11.5
Metabolic syndrome	31	15.5
CHA2DS2- VASc		
≤1	10	5
≥2	175	87.5

Table 2: Distribution according to symptomatology

Parameter	Number of Patients (n)	Percentage (%)
Breathlessness	120	60
Palpitation	34	17
Chest pain	11	5.5
Pedal edema	75	37.5
Stroke	41	20.5
asymptomatic	21	10.5

Table 3: Distribution according to Aetiology of Non - Valvular AF group on Echocardiography

Aetiology	Number of patients (n)	Percentage (%)
HHD	127	70.55
CAD	33	18.33
DCM	8	4.44
HOCM	3	1.67
CHD	3	1.67
COPD	3	1.67
Lone AF	3	1.67
Total	180	100.0

Table 4: Distribution according to various parameters assessed on echocardiography

Echocardiography	No of patients (n)		Total (n)
	Present	Absent	
EF<44%	63	137	200
LVH	109	91	200
Diastolic Dysfunction	41	159	200
RWMA	35	165	200
LA Clot	6	194	200

Table 5: Distribution according to complications of atrial fibrillation

Complications	No of patients (n)	Percentage (%)
Congestive cardiac failure	110	55
Embolism	43	21.5
No complications	27	13.5
Death	20	10.0
Total	200	100.0

Discussion

Atrial fibrillation is the most common arrhythmia whose incidence increases dramatically with age and is a significant source of disability and death in the elderly population. In a study done by N Vidya et al, mean age was found to be 47 yrs and males were predominant i.e. 55% and females were 45%. [6] In this study mean age was 66.24±13.41 yrs. In a study done by Michael et al, Hypertension was an independent predictor of AF and was found in around 60-80% of AF population. [7] In Framingham study also

hypertension and diabetes were the significant independent predictors of atrial fibrillation after adjusting for age and other predisposing conditions. For men and women respectively, diabetes conferred a 1.4 and 1.6 fold risk and hypertension conferred a 1.5 and 1.4 fold risk after adjusting for other associated conditions. [8] In a study done by Vyssoulis comprising of 15,075 consecutive, non-diabetic patients with essential hypertension (age range: 40-95 years, 51.1% males), the prevalence of the Metabolic Syndrome varied from 31.7% to 47.8% and

all the components of the criteria were associated independently with Atrial Fibrillation.[9] The CHA2DS2-VASc score stratified the patients by taking history of congestive heart failure, Hypertension, Diabetes Mellitus, Vascular Disease, Female sex (1 point each) and Age >75 yrs and Previous Stroke or TIA (2 points each). The score was more than 2 in 86% patients. Scores of ≥ 2 are considered to be at high risk for stroke occurrence. This had been reported that patients with Atrial Fibrillation are at five to seven fold greater risk of stroke than the general population and strokes secondary to Atrial Fibrillation have a worse prognosis than in patients without Atrial Fibrillation.[10,11]

In the present study dyspnea that was class IV in 120 patients (60%) followed by pedal edema in 75 patients (37.5%), Stroke in 41 patients (20.5%), Palpitations in 34 patients (17%), Typical Chest Pain in 11 patients (5.5%) and in 21 patients (10.5%) AF was discovered incidentally during work up of some inter-current illness. Dyspnea was the most common presenting complaints of the patients enrolled in this study. According to a study done by Tischler et al, dyspnea was reported in 62% of patients, palpitations in 33% patients, and syncope in 12% patients, Flaker et al in his study observed that 78% patients had dyspnea and 11% had chest pain at presentation whereas Levey et al, reported that 54.1% patients had palpitations, 44.4% patients had dyspnea and 10.1% patients had chest pain. Fatigue was noted in 14.3% patients. Atrial fibrillation was of Permanent type in 57 patients (57%) followed by persistent AF in 17 patients (17%) and new onset in 16 patients (16%).[12-14]

Hypertension and atrial fibrillation are the two important public health priorities. The prevalence of them is increasing worldwide and the two conditions often coexist in the same patient. Hypertension and AF are strikingly related to an excess risk of cardiovascular disease and death. Hypertension ultimately increases the risk of AF, and because of its high prevalence in the population, it accounts for more cases of AF than other risk factors. Among patients with established AF, hypertension is present in about 60% to 80% of individuals. In this study also Hypertension was the most common etiology found in the Non - valvular AF group on Echocardiography followed by Coronary Artery Disease. In Framingham Study done by Kannel et al, maximum patients had hypertensive heart disease (47%) as the most common etiology of AF followed by Rheumatic heart disease (17%) followed by CAD in 10% patients.[15] In a study done by A. Banerjee et al, 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.[16] Presence of abnormal EF (LV systolic dysfunction) independently predicts the risk of stroke as shown by Atrial fibrillation investigators study.[17] 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 $=$ 45mm, ($p > 0.001$). 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%).[18]

Atrial Fibrillation increases the risk of stroke, heart failure, and overall mortality.[19] Atrial fibrillation and congestive cardiac failure share similar risk factors, frequently coexist, and have additive adverse effects when occurring in conjunction. The association between AF and the development of CHF was analyzed in a study of 3288 patients diagnosed with AF at the Mayo Clinic. Twenty-four percent developed Heart Failure during a mean follow-up of 6.1 years, with an incidence of 44 per 1000 patient-years. A spike in the incidence of Congestive Heart Failure was seen early after the diagnosis of AF, with 7.8% of cases occurring within the first 12 months, and approximately 3% per year thereafter.[20]

Troughton RW et al concluded that echocardiography provides vital information about cardiac function, complications, and prognosis in patients with AF. Modalities like Transesophageal Echocardiography and Intracardiac Echocardiography can help to guide ablation therapy and decisions related to cardioversion. The integrated use of echocardiography will be an important component in the optimal management of the looming AF epidemic.[21]

Conclusion

Hypertension was the most common aetiology found in males of elderly age group. The presenting complaints of these patients were dyspnea followed by pedal oedema. These patients were associated with increased left atrial size and the most common complications present in this study were congestive cardiac failure followed by stroke. This study has provided many insights on potential risk factors for the occurrence of atrial fibrillation and its various presentations. This would help in early diagnosis and prompt treatment of patients with AF which remains a challenging problem in hour of emergency.

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Conflict of Interest: Nil

Source of support: Nil