A Study of Epidemiology, Clinical Profile, Management of Atrial Fibrillation in Rural Area

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ABSTRACT

Background: AF is the most common sustained heart rhythm disorder in the general population with a community prevalence of 0.5-5.5% worldwide. Studies conducted in India have shown wide variations in AF prevalence, ranging from 0.1 to 1.6%. Unfortunately, in India population-based information on AF is limited. Moreover, the available knowledge on AF and oral anticoagulation (OAC) practices are largely derived from the hospital-based studies. Till date, there are only two community based prevalence studies on AF in India. Hence the study team decided to take up a project to focus the epidemiological aspects of the disease.

Methods:

A Prospective observational study was conducted on 311 adults (>18 years age), suffering with atrial fibrillation; satisfying inclusion and exclusion criteria at Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem for a period of 18 months (from January 2021 to June 2022). Ethical and Research Committee clearance was obtained from Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem. After taking informed written consent; history and clinical examination was done and data needed was recorded, entered in a data collection sheet in Excel format and analysed using SPSS Software.

Results and Conclusion: The present study concludes that patients aging 41-50 years were at the higher risk of AF. The mean age was found to be 45.78 ± 10.87 years. Female gender shown preponderance. Patients belonging to lower socioeconomic status were suffering from AF the most. The social habits like smoking, alcoholism were posing risk to develop AF. Chief symptoms of patients include palpitation, shortness of breath, chest pain, fatigue, limb weakness, syncope and others like cough. The disease conditions contributing to the etiology of AF include rheumatic heart disease (RHD), systemic hypertension, coronary heart disease, hyperthyroidism, dilated cardiomyopathy, mitral valve prolapse syndrome, chronic obstructive pulmonary disease, drug induced, lone or undetermined AF. Patients with rheumatic heart disease and AF had a mean age of 41.25 ± 6.57 years. There was a female preponderance. Most subjects were in class III of NYHA classification. There was a significant statistical difference between subjects with RHD and those without RHD in terms of serum creatinine, LVED diameter and LVEF %. The common drug classes were diuretics, ACE inhibitors, ARBs, β -blockers, inotropes, sodium channel blocker, calcium channel blockers.

Key words: Atrial fibrillation, Rheumatic Heart Disease.

Introduction

Atrial fibrillation (AF) is characterized by highfrequency excitation of the atrium that results in both dyssynchronous atrial contraction and irregularity of ventricular excitation¹. Although AF may occur in the absence of known structural or electrophysiological abnormalities, epidemiological association studies are increasingly identifying comorbid conditions, many of which have been shown to cause structural and histopathologic changes that form a unique AF substrate or atrial cardiomyopathy².

AF is the most common sustained heart rhythm disorder in the general population with a community prevalence of 0.5-5.5% worldwide. Studies conducted in India have shown wide variations in AF prevalence, ranging from 0.1 to 1.6 (%)³. Unfortunately, in India population-based information on AF is limited. Moreover, the available knowledge on AF and oral anticoagulation (OAC) practices are largely derived from the hospital-based studies. Till date, there are only two community based prevalence studies on AF in India⁴.

Studies have established that advanced age, male sex, and European ancestry are prominent AF risk factors. Other modifiable risk factors include sedentary lifestyle, smoking, obesity, diabetes mellitus, obstructive sleep apnea, and elevated blood pressure predispose to AF, and each factor has been shown to induce structural and electric remodeling of the atria⁵. Both heart failure and myocardial infarction increase risk of AF and vice versa creating a feed-forward loop that increases mortality. Other cardiovascular outcomes attributed to AF, including stroke and thromboembolism. are well established, and epidemiology studies have championed therapeutics that mitigate these adverse outcomes⁶. However, the role of anticoagulation for preventing dementia attributed to AF is less established. Our Study is a comprehensive examination of the epidemiological data associating unmodifiable and modifiable risk factors for AF and of the pathophysiological evidence supporting the mechanistic link between each risk factor and AF genesis⁷. The past 3 decades have been characterized by an exponential growth in knowledge and advances in the clinical treatment of atrial fibrillation (AF)⁸. The aim of present study is calculate the prevalence and incidence rate atrial fibrillation, to study about risk factors and Clinical Profile of atrial fibrillation management and to study about current approach of atrial fibrillation management

Patients and Methodology: A Prospective observational study was conducted on adults >18 years age, who came to OPD and got admitted to general ward with atrial fibrillation at Vinayaka Mission's Kirupananda Variyar Medical College & Hospital, Salem, for a period of 18 months (from January 2021 to June 2022). Prior to the initiation of the study, Ethical and Research Committee clearance was obtained from Vinayaka Mission's Kirupananda Variyar Medical College & Hospital,

Salem. After taking informed written consent; history and clinical examination was done for the selected cases according to proforma. Patients with atrial fibrillation, satisfying inclusion and exclusion criteria were registered in the study. Age, gender, presenting complaints and signs, diagnosis and other relevant investigations were recorded.

All the data was entered in a data collection sheet in Excel format and analysed using SPSS Software. Numerical values were reported using mean and standard deviation. Categorical values were reported using number and percentages.

During present study, total 500 subjects were reviewed. Among them 311 subjects meeting study criteria were enrolled into the study and data needed was collected.

Statistically analysis: Data was represented in the form of frequency and percentage. For qualitative variables were assessed by Chi Square test, with continuity correction for 2×2 table and quantitative data was represented using mean and standard deviation. Analysis of quantitative data within the groups was done using paired t test. A 'P' value of <0.05 was considered statistically significant.

RESULTS AND DISCUSSION

A total of 311 patients were included in present study and were distributed according to the age group. Majority of patients were belonging to 41-50 years (46.62 %). Gender wise distribution of patients revealed that females were mostly suffering from atrial fibrillation (59.16 %).

A study by Feinberg WM⁹ postulated that there are an estimated 2.2 million people in the United States with AF, with a median age of about 75 years. The prevalence of AF is 2.3% in people older than 40 years and 5.9% in those older than 65 years. Approximately 70% of individuals with AF are between 65 and 85 years of age. The absolute number of men and women with AF is about equal. After age 75 years, about 60% of the people with AF are women. Sahar Naderi¹⁰ concluded that the mean age for all patient hospitalizations was 70 years, with 67% aged 65 years or more. The prevalence of AF increases markedly with age, and a review of histopathologic studies reveals that normal aging produces histologic changes in atrial conduction that may lead the development to of atrial arrhythmias. Increasing age is the most

powerful predictive factor. Superimposed upon the age-related atrial changes are the triggers of adrenergic stimulation and perioperative pericarditis/atrial ischemia.¹¹

The analysis of socioeconomic status of our subjects revealed that most belong to low economic class (28.94 %). Elin Danielsen Lunde postulated that low socioeconomic status was associated with poorer outcomes when AF was present.¹²

In univariate analysis by Elin Danielsen Lunde showed that alcohol consumption, income, education and smoking habits did not affect spontaneous conversion. High coffee consumption and high body mass index were associated with a significantly greater risk of atrial fibrillation. Type A behaviour pattern and acute life stress affect the development and spontaneous conversion of atrial fibrillation.¹³

Higher mortality rates were observed in wealthier countries, potentially secondary to a survivor effect where patients survive long enough to suffer from AF and its complications.¹⁴

An observation of the social habits of our subjects shown that most do not have habits that pose risk of developing atrial fibrillation (55.31 %). Modulators of and common barriers to achieving risk reduction and lifestyle change include self-efficacy, social support, age, sex, marital and socioeconomic status, education, employment, and psychosocial factors such as depression, isolation, anxiety and chronic life stress.¹⁵ SHS exposure during gestational development and during childhood were both associated with having AF later in life. Furthermore, this association was even stronger in the absence of established risk factors for AF. These findings indicate that SHS may be an important, potentially modifiable risk factor for the development of AF, operating outside of known mechanisms for the arrhythmia.16

Among adults, 89% had low fruit consumption, 49% were overweight or had augmented waist circumference, 42% had smoking habits, 57% consumed alcohol regularly, 22% had high blood pressure measurements and 5% had abnormal glycaemic levels. An 11% prevalence of AF was found among the elderly.¹⁷

Most of our subjects were experiencing palpitations (74.60%), followed by shortness of breath (62.70%), chest pain (42.44%), fatigue (29.58%), limb weakness (4.82%) and syncope (5.47%). 11.90 %

subjects were complaining of other random symptoms like cough.

Aronow WS¹⁸ observed chest pain due to myocardial ischemia, hypotension, severe heart failure, or syncope.

An observation of etiological factors revealed that most of our subjects had rheumatic heart disease (76.21%), followed by systemic hypertension (8.68%), coronary heart disease (5.79%), hyperthyroidism (2.25%), dilated cardiomyopathy (1.93%), mitral valve prolapse syndrome (1.29%), drug induced (1.29%) and finally lone or undetermined AF (0.96%).

Levy S¹⁹ postulated that important predictive factors of AF include hypertension, left ventricular hypertrophy and diabetes. The risk of the development of AF, in an individual patient, is often difficult to assess. Increasing age, presence of valvular heart disease, and congestive heart failure increase the risk of atrial fibrillation. A study by Longhi S²⁰ concluded that age, HF, LV ejection fraction, left atrial size and right atrial pressure were the main independent risk factors, while wall thickness and etiology were not the main independent risk factors. A study by Lopes MP et al²¹ reported that among 106 patients included, 65.1% (n = 69) had rheumatic etiology and 34.9% (n = 37) had nonrheumatic etiology. Except for higher female gender, (73.9 vs. 43.2%, respectively; p = 0.001), there wereno demographic differences between rheumatic and non-rheumatic disease patients.

A study by Lopes MP et al²¹ reported that rheumatoid heart disease patients exhibited greater pulmonary artery systolic pressure (62.3 19.7 vs. 52.7 17.1 mmHg, respectively; p = 0.029) and a smaller left ventricular end-diastolic diameter (50.0 6.6 vs. 54.6 10.7 mm, respectively). There were no additional echocardiographic variations between groups. With regard to age, sex, atrial fibrillation, creatinine, LVED diameter, LVEF, mechanical helping device, and number of prior surgeries, we discovered many differences between the two groups (rheumatic vs. non-rheumatic).

The common drugs observed in the study by Amin A et al^{22} were found to be overlapping with our study.

CONCLUSION

The present study concludes that patients aging 41-50 years were at the higher risk of AF. The mean age was found to be 45.78±10.87 years. Female gender shown preponderance. Patients belonging to lower socioeconomic status were suffering from AF the most. The social habits like smoking, alcoholism were posing risk to develop AF. Chief symptoms of patients include palpitation, shortness of breath, chest pain, fatigue, limb weakness, syncope and others like cough. The disease conditions contributing to the etiology of AF include rheumatic heart disease (RHD), systemic hypertension,

coronary heart disease, hyperthyroidism, dilated cardiomyopathy, mitral valve prolapse syndrome, chronic obstructive pulmonary disease, drug induced, lone or undetermined AF. Patients with rheumatic heart disease and AF had a mean age of 41.25 ± 6.57 years. There was a female preponderance. Most subjects were in class III of NYHA classification. There was a significant statistical difference between subjects with RHD and those without RHD in terms of serum creatinine, LVED diameter and LVEF %. The common drug classes used in present study were diuretics, ACE inhibitors, ARBs, β -blockers, inotropes, sodium channel blocker, calcium channel blockers.

Variable	Frequency	Percentage
Age group		
20-30 years	31	9.97
31-40 years	89	28.62
41-50 years	145	46.62
51-60 years	46	14.79
Means ±Sd (Age)	45.78±10.87	100
Sex		
Male	127	40.84
Female	184	59.16
Socioeconomic status		
High	84	27.00
Medium	74	23.79
Low	90	28.94
Very - low	63	20.26
Social Habits		
Smoker	45	14.47
Alcohol	38	12.22
Alcohol and Smoking	56	18.01
No habits	172	55.31

Table 2: Patients distributed according to symptoms:

Symptoms	Frequency (%)
Palpitation	232 (74.60%)
Shortness of breath	195 (62.70%)
Chest pain	132 (42.44%)
Fatigue	92 (29.58%)
Limb weakness	15 (4.82%)
Syncope	17 (5.47%)
Others (Cough etc)	37 (11.90%)

Etiological Factors	Frequency (%)
Rheumatic Heart disease (RHD)	237 (76.21%)
Systemic Hypertension	27 (8.68%)
Coronary Heart disease	18 (5.79%)
Hyperthyroidism	7 (2.25%)
Dilated cardiomyopathy	6 (1.93%)
Mitral valve prolapse syndrome	5 (1.61%)
Chronic obstructive pulmonary disease	4 (1.29%)
Drug induced	4 (1.29%)
Lone or Undetermined AF	3 (0.96%)

 Table 3: Patients distributed according to etiological factors:

 Table 4: Division of patients according to Rheumatic history and demographic parameters:

Variable	RDH	Non-RDH	P-Value
Age (Means ±Sd)	41.25±6.57	47.24±10.57	0.001
Sex			
Male	97	30	0.01
Female	139	45	
NYHA Classification of s	ymptoms		
Ι	12	7	0.676
II	57	13	
III	96	44	
IV	54	27	

Table-5: Laboratory Investigations:

	RHD	NRHD	P value
Hematological			
Hemoglobin, (mg/dl)	11.6 (10.0-13.2)	12.5 (11-14)	0.744
Creatinine, (mg/dl)	1.2 (0.9-1.5)	1.4 (1.0-1.8)	0.023
Echocardiography			
LVED diameter, mm	49.8 (44.4-55.2)	55.25 (48.5-62)	0.033
LVES diameter, mm	34.1 (31-37.2)	36.25 (28.5-44.0)	0.06
LVED volume, ml	109.1 (86-132.2)	131.1 (92.2-170)	0.797
LVES volume, ml	40.5 (29-52)	62 (34-90)	0.139
LVEF, %	59.4 (58.5-73.8)	67.5 (57-78)	0.037
PSAP, mmHg	59.75 (44.2-75.3)	59 (51-67)	0.364

Table-6: Management of AF:

Drug class	Drug name	Percentage usage
Diuretics	Loop diuretics (Furosemide)	70 %
ACE inhibitors	Enalapril, Ramipril.	75 %
ARBs	Telmisartan.	90 %
B-blockers	Atenolol.	88 %
Inotropes	Digoxin.	90 %
Sodium channel blocker	Amiodarone.	85 %
Calcium channel blockers	Amlodipine.	83 %

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