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Original Research Article

Study on Clinical Profile of Patients with Atrial Fibrillation at Tertiary Care Hospital

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Abstract:

Background: Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia encountered in clinical practice. This study is about the etiological and clinical profile of paroxysmal, persistent and permanent AF. The aim of this study was to review the clinical epidemiological features of atrial fibrillation.

Materials and Methods: A hospital-based descriptive study was conducted among 50 patients, diagnosed as atrial fibrillation in Medicine Department of DMCH, from January 2023 to December 2023.

Results: Out of 50 patients with atrial fibrillation, 32% were aged between 60 – 69 years and 42(84%) were females and 8 (16%) were males. Permanent AF was seen in 56% patients.

Conclusions: Palpitation followed by dyspnoea was the major symptoms encountered with atrial fibrillation, and in females within the age group of 50 years and above are prone to develop AF.

Keywords: Atrial fibrillation, Cardiac rhythm, AF, Permanent AF.

Introduction

Atrial Fibrillation is the most common arrhythmia treated in clinical practice and the most common arrhythmia for which patients are hospitalized. AF is associated with an approximately fivefold increase in the risk for stroke and a twofold increase in the risk for all-cause mortality. Atrial fibrillation (AF) is a supraventricular arrhythmia characterized electrocardiographically by low-amplitude baseline oscillations (fibrillatory or f waves) and an irregularly irregular ventricular rhythm. The f waves have a rate of 300 to 600 beats/min and are variable in amplitude, shape, and timing.

Long-established risk factors for AF include aging, male sex, hypertension, valve disease, left ventricular dysfunction, obesity, and alcohol consumption. Emerging risk factors include prehypertension, increased pulse pressure, obstructive sleep apnea, high-level physical training, diastolic dysfunction, predisposing gene variants, hypertrophic cardiomyopathy, and congenital heart disease. Potential risk factors are coronary artery disease, kidney disease, systemic inflammation, pericardial fat, and tobacco use. AF has substantial population health consequences, including impaired quality of life, increased hospitalization rates, stroke occurrence, and increased medical costs. [1,2] The pathophysiology of AF centers around 4 general types of disturbances that promote ectopic firing and reentrant mechanisms, and include the following: ion channel dysfunction, Ca2+-handling abnormalities, structural remodeling, and autonomic neural dysregulation. Atrial fibrosis has emerged as a significant contributor to AF. Fibrosis can favor atrial arrhythmogenesis in several ways. First fibrous tissue can physically separate atrial muscle fibers in the longitudinal direction, interrupting muscle continuity and creates a physical barrier to conduction. Second, fibrosis is associated with the proliferation of fibroblasts and their differentiation into a myofibroblast phenotype. The interaction between cardiomyocytes and fibroblasts via cell coupling connexin hemichannels make fibroblasts act as an electric sink for cardiomyocyte bioelectricity. [3,4]

Although the reported annual incidence rates for AF have varied widely depending on the populations studied (from 0.8 to 28.3 cases per 1000 person-years), time trend analyses reveal relatively stable incidence density rates over time (e.g. 27.3 per 1000 life-years in 1993 compared with 28.3 per 1000 life-years in 2007). In contrast, the prevalence of AF continues to rise (e.g. from 41 cases per 1000 in 1993 to 85 cases per 1000 in 2007). Some of the increasing prevalence may be attributable to a modest improvement in AF-related survival (e.g. 3-

year mortality rate reduction from 45% to 42% in 1993 versus 2005), which is related to better detection and treatment of underlying conditions such as hypertension, coronary artery disease (CAD), and heart failure (HF). [5,6]

Material and Methods

A descriptive study of 50 patients who presented with Atrial Fibrillation in the inpatient's settings of the department of Medicine in Darbhanga Medical College and Hospital, Laheriasarai, Bihar. The study was conducted during the period of January 2023 to December 2023. All patients with recurrent, paroxysmal, persistent and permanent AF were included in this study. The diagnosis of AF was made on the basis of history, clinical examination and confirmation with 12 lead ECG. Colour Doppler echocardiogram was done to confirm any structural heart disease and to assess the left atrial size.

Results

Out of the 50 patients with AF, 42(84%) were females and 8 (16%) were males. The majority of patients were between the ages of 60 – 69 years (32%) (Table 1). Paroxysmal AF was seen in 8 patients (16%), persistent AF in 14 (28%) and permanent AF in 28 patients (56%). For thromboembolic prevention, AF is categorized into valvular AF and non-valvular AF. Non-Valvular AF was seen in 27 patients (54%) and remaining 23 (44%) were valvular AF (Table - 2). In patients with non-valvular AF, CHA2DS2VASc scoring was done. Among non-valvular AF, CHA2DS2VASc scoring >2 was seen in 16 (32%) patients. Among valvular AF, mitral valve disease was seen in 55% of patients. Lone AF was in seen 4 patients (8%).

Palpitation (52%) was the most common presenting complaint encountered, followed by dyspnoea (14%), chest pain (5%) and stroke (4%) (Table 3). Apart from valvular heart disease, the most common etiology is hypertension followed by ischemic heart disease and dilated cardiomyopathy.

In the management of AF, the heart rate control was achieved in 33 (66%) patients, rhythm control in 21 patients (42%) and oral anticoagulation (warfarin) was used in 37 patients (74%), all of them were valvular AF patients and those with CHA2DS2VASc score of more than two. 34 patients whose CHA2DS2VASc score were <2, were given only aspirin. Among patients on oral anticoagulation, 28 patients had a one year follow up in which it was found that oral anticoagulant in therapeutic range (INR 2 – 2.5) was seen in 63% of patients. Patients with a dilated left atrium more than 5 cm was seen only in 15% while majority lies in the range of 4-5 cm (85%) (Table 4).

Table 1: Age distribution of patients with AF

Age group (years)	Male	Female	Total (%)
20-29	0	3	6
30-39	0	6	12
40-49	1	5	12
50-59	2	12	28
60-69	2	14	32
70-79	0	2	4
>80	0	3	6

Table 2: Distribution of AF patients based on etiology

Etiology	Male	Female	Total (%)
Valvular	2	21	44
Hypertension	0	9	18
Ischemic heart disease	2	6	16
Dilated cardiomyopathy	1	5	12
Hyperthyroidism	0	2	4
Congenital heart disease	0	1	2
Lone AF	0	1	2

Table 3: Clinical presentation of atrial fibrillation

Clinical Presentation	Frequency
Palpitation	26(52%)
Breathlessness	7(14%)
Chest pain	5(10%)
Syncope	1(2%)
Congestive cardiac failure	4(8%)
CVA	2(4%)
Hypotension	1(2%)
Asymptomatic	4(8%)

Table 4: Left atrial size in atrial fibrillation

Left atrial size	No. of patients	Percentage
<4 cm	12	24
4-5 cm	34	85
>5 cm	6	15

Discussion

In this study, the majority of the patients were females 42 (84%) compared to males (16%). Recent data suggests that AF is having equal incidence in both the sexes as age advances. 1 in 4 lifetime risk of AF is seen in both men and women at the age of 40 years. Since women have a better longevity, the prevalence of AF in elderly individuals is nearly same or even higher among women than in men. In the two Indian studies by Sharma et al and Gurpal Singh, et al., the number of females was slightly more than males. In the Women's Health Study, increased weight and body mass index along with hypertension constituted the most important population attributable risk factors for AF. All these data are related to nonvalvular AF. [7,8,9]

However, rheumatic heart disease is still the most common cause of AF in India and other developing countries. Since it affects more women than in men, the overall prevalence of AF in India even in younger population may be higher in women compared to that in men. Valvular heart disease was the cause of AF in 44% of cases, followed by ischemic heart disease in 15%, and hypertension was seen in 18% of cases.

A maximum number of AF cases are associated with rheumatic heart disease, the common valvular lesion being mitral stenosis. Palpitation was the most common presenting complaint encountered followed by dyspnea, chest pain, and stroke.

These observations are similar to the finding from the study by Fuster, et al. In this study, the permanent AF was seen in 59.57% of cases, which is similar to the study reported from Argentina, where the 57% had permanent AF, and 56% were asymptomatic. Oral anticoagulation was tried as a mainstay for prevention of thromboembolic episodes in 79.78% of the cases in this study, and in another study, 72.7% (95%CI: 63.5-79.0) cases the anticoagulation was started. All patients with nonvalvular AF and a CHA2DS2 VASc score >2 were anticoagulated. [10,11]

Anticoagulation in therapeutic range was maintained only in 63% of cases. Direct current cardioversion for atrial fibrillation without oral anticoagulation is associated with a high risk of thromboembolism. Left atrial dilatation is a marker of chronicity and severity of left ventricular dysfunction and also the degree of increased LA pressure. LA size assessment plays a significant role in atrial fibrillation and transthoracic echocardiography is particularly helpful in assessing left atrial size. Normal LA size should be less than 40 mm, and those with LA size more than 45-50 mm have been shown to be at risk of developing AF. Dilated LA is associated with stroke and also the risk of relapse after electrical cardioversion or after radiofrequency ablation is done. Left atrial enlargement is common in AF, particularly in patients with mitral valve disease, left ventricular dilatation, annular calcification or hypertension.

In addition, sustained AF itself can lead to a further increase in left atrial size, an effect that is reversible after cardioversion and maintenance of sinus rhythm. About 20-30% of all strokes are due to AF. Results from ROCKET-AF trial sub study done by BA Steinberg et al. show that among patients with AF at moderate to high risk of stroke of receiving anticoagulation, those with persistent AF have a higher risk of thromboembolic events and worse survival compared with paroxysmal AF. [12,13,14,15]

Conclusion

The study provided insight into potential risk factors for the occurrence of atrial fibrillation, such as valvular heart disease, ischemic heart disease, cardiomyopathies and also various presenting features of atrial fibrillation. An important preventable cause of atrial fibrillation in this study is hypertension. Heart rate correction can be achieved in most of the patient with AF, and anticoagulation is the mainstay of treatment needed for most of the patients.

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