ORIGINAL ARTICLE

Clinical and Echocardiographic Profile of Atrial Fibrillation

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Abstract

The present study was done on 100 newly diagnosed patients of atrial fibrillation attending outpatient department of Internal Medicine, Govt. Medical College, Jammu over a period of 1 year with effect from June 2004 to May 2005. Patients who either attended OPD on a single day in a week or admitted patients were included in the study. Male: female ratio was 1:1.94, with mean age of the patient 50.16 years (range 13-96 years). 60% of patients were aged 50 years and above. Dyspnoea NYHA class II -IV was the commonest 74% complaint followed by palpitations 57%, fatigue 19%, syncope 17% and chest pain 11%. 14% patients were asymptomatic at presentation. Congestive cardiac failure was present in 67%. Rheumatic heart disease 54% was the commonest underlying etiological factor, followed by, coronary artery disease 9%, HTN (alone) and COPD (8% each), cardiomyopathy 7%, hyperthyroidism 3% and congenital heart disease 2%, 9% of the patients had the lone atrial fibrillation. 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. Ventricular rate exceeded 100 per minute in 69 % of cases.

Key Words

Atrial fibrillation, Echocardiography, Left atrium, Rheumatic Heart Disease

Introduction

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 (1).15% of all strokes are related to AF associated with thromboembolic events (2). 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 (3).

Electrocardiography in AF shows an irregularly irregular ventricular rhythm, 'P' waves may be absent or coarse fibrillary waves may be present. Fast fibrillary waves are seen more often in recent onset atrial fibrillation (4,5). Technical advances in 2D-Doppler ultrasonography have led to the emergence of echocardiography as an integral tool in the evaluation and management of patients with cardiac rhythm disturbances.

Material & Methods

The one year observational study on clinical and echocardiography profile of atrial fibrillation was conducted on 100 patients, 34 males and 66 females either admitted or attending OPD in the Postgraduate Department of Medicine, Govt. Medical Hospital, and Jammu. 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 questionare

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(annexure).Out of 100 patients 80 were those who attended OPD and rest were 20 indoor patients 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 I shows that most common symptom was dyspnoea 74%followed closely by palpitation 57%. There was history of mild to moderate chest pain in 11% of patients. 17% of patients had history of syncope/dizzy spells. Fatigability was noticed in 19% cases and congestive cardiac failure noticed in 67% cases.

Table 2 shows that majority of patients, 54% had RHD as underlying cause of atrial fibrillation. There were 41% females and 13% males in this group. 9% patients had coronary artery disease. Hypertension alone was present in 8% of patients. 8% of patients had COPD as a risk factor. 7% of patients had cardiomyopathy. Hyperthyroidism was found in 3% of patients. No underlying disease was found in 9% of patients.

Table-3 shows that 69% patients had heart rates >100. Fibrillary P wave was seen in 23% patients and absent p waves in 77% of patients. LVH was seen in 10% patients, RVH in 29% patients, RBBB in 5% patients, and LBBB in 6% patients, ST depression and T wave inversion in 58% patients.

As evident from above table the maximum number of patients i.e. 35% had LA dimension between 4.1-5.0 cm2. (*Table 4*)

Discussion

Out of 100 patients, 74% of patients presented with history of dyspnoea, followed by palpitation in 57%. Mild to moderate chest pain was present in 11% of patients, 17% patients had syncope /dizzy spells, fatigue was noticed in 19% patients, whereas 14% patients presented without symptoms and were found to have incidental AF i.e. lone atrial fibrillation. 69% patients had CCF and neurodeficit in 9% of patients was noted.

Tischler *et al* (6) reported dyspnoea in 62% of patients, palpitation in 33% patients, and syncope in 12% patients in a similar study. Flaker *et al* (7) in their study observed that 78% patients had dyspnoea and 11 % had chest pain at presentation whereas Levey *et al* (8) reported that

Table I. Various Mode of Presentation of Patients with Atrial Fibrillation

Symptoms	No. of patients	Percentage
Dyspnoea NYHA Class II– IV)	74	74
Congestive cardiac failure	67	67
Palpitation	57	57
Fatigue	19	19
Syncope/ Dizzy spells	17	17
None	14	14
Chest pain	11	11

Table 2. Clinical Characteristics According to Cause of Atrial Fibrillation

Risk factors	Male	Percentage	Female	Percentage	Total	Percentage
RHD	13	13	41	41	54	54
HTN (alone)	3	3	5	5	8	8
COPD	6	6	2	2	8	8
Coronary artery disease	5	5	4	4	9	9
Cardiomyopathy	5	5	2	2	7	7
Congenital heart diseases	0	0	2	2	2	2
Hyperthyroidism	0	0	3	3	3	3
Lone AF	2	2	7	7	9	9
Total	34	34	66	66	100	100

Table 3. ECG Findings of Patients with Atrial Fibrillation

ECG findings	No. of patients	Percentage
Heart Rate -- > 100	69	69
< 100	31	31
Fibrillary waves	23	23
Absent 'p' waves	77	77
RBBB	5	5
LBBB	6	6
ST depression/ 'T' wave inversion	58	58
LVH	10	10
RVH	29	29

Table 4. Left Atrial Dimensions

LA Dimensions	No. of patients	Percentage
< 4.0 cm^2	32	32
4.1 – 5.0 cm^2	35	35
> 5.0 cm^2	33	33

54.1% patients had palpitation, 44.4% patients had dyspnoea and 10.1% patients had chest pain. Fatigue was noted in 14.3% patients. In our study Congestive cardiac failure was reported in 69% patients whereas study conducted by Levey *et al* (8) reported 29.8% patients with CCF.

According to Davis *et al*, (3) RHD, Ischaemic Heart Disease (IHD), hypertension and cor-pulmonale are the most commonly found condition in patients of AF. In current study rheumatic heart disease was the commonest cause of AF. 54 patients which included 41 females and 13 males, 9% patients had coronary artery disease in the form of recurrent or old myocardial infarction with or without hypertension. Hypertension (alone) was present in 8 patients with atrial fibrillation in our study. 8 had COPD; 7 had cardiomyopathy, 3 patients had hyperthyroidism and 9 had lone atrial fibrillation.

In India, a study conducted by Singh *et al* (9) 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* (10) 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* (11) showed RHD in 55% patients, cardiomyopathy in 11.25%, thyrotoxicosis and COPD in 8.75% each. Studies conducted by Levey *et al* (8) 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* (12) reported RHD in 54.08% respectively and found that RHD was the most common cause of AF. In our study also RHD was the commonest underlying cause of AF constituting 54% of cases which was in contrast to study conducted by Levey *et al* (8) with a prevalence of 15.2%.

Flaker *et al* (7) found that LA size was a useful predictor of recurrent AF; the larger the left atrium the higher the risk of developing atrial fibrillation. Henry *et al* (13) 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* (14) and Blackshear *et al* (15)and according to Sandflippo *et al* (16), atrial size is increased in time with atrial fibrillation even in the absence of other causes of atrial enlargement. In our study the maximum number of patients i.e. 35% had LA dimension between 4.1 -5.0 cm2, LA dimension less than 4.0 cm2 was seen in 32% of patients and LA dimension more than 5.0 cm2 was seen in 33% of patients and mean LA size was 4.72cm^2.

In our study of various ECG findings in patients with atrial fibrillation, 69% patients had heart rate > 100 per minute, fibrillary 'p' waves were present in 72% of patients, LVH was seen in 10% of patients, RVH was seen in 29% of patients, RBBB was seen in 5% of patients, LBBB was seen in 6% of patients and ST depression and Twave inversion in 58% of patients. Kumar *et al* (11) in their study observed ST and T changes in 15%, low voltage in 4%, LBBB in 4%, RBBB in 2%, fast ventricular rate in > 100 in 85%, fibillary 'p' waves in 71%, LVH in 13% and RVH in 30% of patients.

Metabolic syndrome (MS) has been recently associated with an increased risk for the development of atrial fibrillation (AF) in the general population.The prevalence of the MS varied from 31.7% to 47.8% according to the each time definition used (18). However no such association was noted in our study.

Similarly in naother similar study the prevalence of paroxysmal, persistent, and permanent AF was 22.7, 21.5,

and 55.8%, respectively. Underlying cardiac disorders, present in 156/172 patients (90.7%), included hypertensive heart disease (47.7%), valvular heart disease (25.6%), dilated cardiomyopathy (15.7%), and coronary artery disease (6%) (19).The results were though diffrent from our population.

Few recent study establised these facts that Atrial fibrillation (AF) occurs commonly in patients with acute myocardial infarction (MI) and is associated with an increased long-term mortality (20).Simlarly, Atrial fibrillation has been shown to be associated with a poor outcome among patients with ischemic stroke particularly among patients, who are not eligible to oral anticoagulant treatment (21).These, associations were not studied in the present study, which remain limitation of the current study.

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. Ventricular rate exceeded 100 per minute in 69 % of cases and 40% of patients were taking treatment for AF.

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