

## Original Research Article

# Aetiological and Clinical Study of Atrial Fibrillation :An Observational Study in a Tertiary Care Hospital ,Telangana ,India

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### Abstract

**Background:** Atrial fibrillation is the most common sustained arrhythmia seen in clinical practice. It is responsible for increased mortality from all cardiovascular causes and shortens average life span. **Aims:** To know the various clinical presentations in atrial fibrillation and to detect various aetiological factors of atrial fibrillation. **Methodology:** This Observational study was conducted on 50 cases of atrial fibrillation. Cases were examined in detail as per proforma with special reference to cardiovascular system. Investigations like urine examination, complete Blood picture, Erythrocytes Sedimentation rate, Blood urea, Serum creatinine, Blood sugar, Serum electrolytes and chest X-ray examination have been carried out. Special investigations like electrocardiogram, echocardiogram was also done. Whenever necessary blood for culture and sensitivity, CT-Brain in case of stroke. The electrocardiogram was studied for rate and 'f' wave pattern. The echocardiogram was studied to assess the valvular lesion, Mitral Valve Area (MVA) in mitral stenosis cases, and enlargement of chambers particularly the left atrium size. **Results:** Most of the chronic atrial fibrillation is associated with large left atrial size, 4-5cms (56%). Congestive cardiac failure (60%), angina (32%), embolic stroke (14%) are common complications. Incidence of congestive cardiac failure, angina are high in patients of chronic AF with fast ventricular rate. Incidence of embolic stroke is more in rheumatic AF. Incidence of embolic stroke is high in non-rheumatic AF with

the presence of risk factors like age >65yrs, HTN, DM, CCF, LA size > 4.5 cm. Most of the cases of AF associated with MVA is less than 1 sq.cm. (Severe) in RHD. **Conclusion:** Atrial fibrillation due to rheumatic aetiology is more common in younger age group, while the other causes like hypertension, ischemic heart disease common in older age. Females are commonly affected than males. Rheumatic heart disease is commonest cause followed by ischemic heart disease, Hypertension.

**Keywords:** Atrial fibrillation, Clinical Study, Rheumatic aetiology, Arrhythmia, embolic stroke

## INTRODUCTION

Atrial fibrillation is the most common sustained arrhythmia seen in clinical practice<sup>1</sup>. It is responsible for increased mortality from all cardiovascular causes and shortens average life span<sup>2</sup>. The high uncontrolled high ventricular rate in patients with atrial fibrillation over a period may result in progressive cardiomegaly, increased functional mitral regurgitation<sup>3,4</sup> and decreased left ventricular function leading to congestive cardiac failure and risk of sudden deaths. Irrespective of underlying cause<sup>5</sup>. It increases the risk of thromboembolic phenomenon. Its incidence varies with age, ranging from 0.5 percent in young adults to 1.5 percent in age group of 40-70 years and 10 percent in people with more than 70 years age<sup>6</sup>. The high incidence of this problem and its significant contribution to both cardiovascular and cerebrovascular morbidity and mortality aroused interest in us to study the problem<sup>7,10</sup>. This study is aimed at assessing the clinical features, aetiology, left atrial size and mitral valvular area in atrial fibrillation<sup>8,9</sup>. As per the literature search many studies were not found on clinical study of atrial fibrillation. Hence the present study was undertaken to study the etiology and clinical study of atrial fibrillation.

## METHODOLOGY

This Observational study titled "Aetiological and Clinical Study of Atrial Fibrillation :An Observational Study in a Tertiary Care Hospital ,Telangana ,India was carried out during the period of February 2017 to October 2018. The study was conducted on 50 cases of atrial fibrillation, admitted in Medical and Cardiology wards of Mahatma Gandhi Memorial General Hospital, Warangal, with an aim to study the Atrial fibrillation.

### Inclusion criteria

1. All patients presented with atrial fibrillation to MGM hospital from February 2017 to October 2018.
2. Age group between 21 years to 80 years.

### Exclusion criteria

1. Age below 20 years and above 80 years
2. Cases with multifocal atrial tachycardia.
3. Cases with AV conduction blocks.
4. Cases with atrial flutter.

**Ethics:** This study was approved by the Institutional Ethics Committee Kakatiya Medical College, Warangal. An informed written consent was taken from all the patients involved in the study after explaining regarding the study.

**Study Procedure<sup>14</sup>:** All the Fifty cases were examined in detail as per proforma with special reference to cardiovascular system. Other systems were also examined in detail, whenever it was found necessary. In each case, history of present and past illness was carefully inquired into so as to obtain a complete historical background of case. Informed consent was taken from all the patients or their guardians.

Investigations like urine examination, complete Blood picture, Erythrocytes Sedimentation rate, Blood urea, Serum creatinine, Blood sugar, Serum electrolytes and chest X-ray examination have been carried out. Special investigations like electrocardiogram, echocardiogram was also done. Whenever necessary blood for culture and sensitivity, CT-Brain in case of stroke. The electrocardiogram was studied for rate and 'f' wave pattern. The echocardiogram was studied to assess the valvular lesion, Mitral Valve Area (MVA) in mitral stenosis cases, and enlargement of chambers particularly the left atrium size. TEE to detect any thrombi or bacterial vegetation in the cardiac chambers or on valves. For few patients trans esophageal echocardiogram not done because of patient ill health, sometimes patient unwillingness.

**RESULTS:** A Clinical study of 50 patients (aged from 21-80) with electrocardiographically documented AF.

**Age and Sex Distribution:** The present study consist of 50 cases of which there were 27 females and 23 males, showing female predominance. Their age ranging from 21 years to 80 years. Atrial fibrillation was seen more in the patients of age group ranging 31-40 years.

**Table No:1** Age and Sex Distribution

Age Group	Male	Female	Total	Percentage
21-30	6	6	12	24
31-40	4	11	15	30
41-50	4	3	7	14
51-60	5	4	9	18
61-70	4	1	5	10
71-80	-	2	2	4

**Clinical Presentation in 50 cases of Chronic A.F:** In this study the main complaints were dyspnoea, palpitations, pedal edema, chest pain, hemoptysis, weakness of limbs. The duration of symptoms ranged from 15 days to 20 years. Shorter duration in cases of ischaemic heart disease, hypertensive heart diseases, thyrotoxicosis, cardiomyopathies, lone atrial fibrillation but longer duration in rheumatic heart disease

**Table No:2** Clinical Presentation in 50 Cases of Chronic A.F

Sl.No.	Complaint	No. of Patients	Percentage
1.	Dyspnoea	44	88
2.	Palpitations	40	80
3.	Pedal edema	26	52
4.	Chest Pain	19	38

5.	Haemoptysis	6	12
6.	Paralysis	7	14
7.	Syncope	1	2

**Aetiological Incidence:**

In this series of 50 cases an attempt has been made to establish the aetiology by history, clinical examination, ECG, CXR, 2D-Echo Cardiogram. Their incidence has been analyzed.

**Tabel No:3 Aetiology of 50 Case of A.F**

SI. No.	Disease	No. of Patients	Percentage
1	RHD	26	52
2	IHD	7	14
3	HTN	5	10
4	DCM	5	10
5	Pulmonary disease	3	6
6	Constrictive Pericarditis	1	2
7	Lone AF	1	2
8	Marfan's syndrome	1	2
9	Thyrotoxicosis	1	2

In this study Rheumatic Heart Disease (RHD) (52%) is most common cause, followed by Ischemic Heart Disease (IHD) (14%), Hypertension (HTN) (10%) and Dilated Cardiomyopathy (DCM) (10%).

**Aetiological Incidence in 50 cases of A.F in sex distribution:** From the observations it shows that female preponderance is seen in rheumatic and hypertensive heart disease aetiology and male preponderance is seen in IHD, DCM.

**Tabel No:4 Aetiological Incidence in 50 cases of A.F in sex distribution**

SI. No.	Disease	Male	Female	Total
1.	RHD	9	17	26
2.	IHD	4	3	7
3.	HTN	2	3	5
4.	DCM	4	1	5
5.	Pulmonary Disease	3		3
6.	Constrictive pericarditis	-	1	1
7.	Lone A.F.	1	-	1
8.	Marfan's Syndrome	1	-	1
9.	Thyrotoxicosis		1	1

**Age, Sex Incidence according to aetiology of A.F**

From the observation it shows that A.F. commonly presented in 21-50 years of age group. Rheumatic aetiology is most commonly seen below 50 years age, and IHD & Hypertensive heart disease commonly seen above 50 years age. In all groups female preponderance is noted, up to 50 years and male preponderance after 50 years.

**Tabel No:5 Age, Sex Incidence according to aetiology of A.F****Female**

Age Group	RHD	IHD	HTN	THY	Pulmonary Diseases	HC M	C.P.	Lone A.F.	Marfan's
11-20	-	-	-	-	-	-	-	-	-
21-30	5	-	-	-	-	-	-	-	-
31-40	9	-	-	1	-	1	-	-	-
41-50	1	-	1	-	-	-	-	-	-
51-60	1	1	1	-	-	-	1	-	-
61-70	-	1	1	-	-	-	-	-	-
71-80	1	1	-	-	-	-	-	-	-

**Male**

Age Group	RHD	IHD	HTN	THY	Pulmonary Diseases	HC M	C.P.	Lone A.F.	Marfan's
11-20	-	-	-	-	-	-	-	-	-
21-30	4	-	-	-	-	-	-	1	1
31-40	3	1	-	-	-	-	-	-	-
41-50	1	1	2	-	-	1	-	-	-
51-60	1	1	-	-	1	2	-	-	-
61-70	-	1	-	-	2	1	-	-	-
71-80	-	-	-	-	-	-	-	-	-

**(Different) Valvular Affection in RHD with AF (26 cases)**

From the observations it shows that M.S. is commonest lesion out of 26 cases 21 cases have MS (80.7%), followed by MR (57.6%) next AR + MS/MR (23%). Only MS cases are 9 (34.6%), only MR 3(11%) cases other common valvular lesions are MS + MR; MS + MR + AR.

**Tabel No:6(Different) Valvular Affection in RHD with AF (26 cases)**

SI. No.	Valve	No. of Patients	Percentage
1.	MS	9	34.6
2.	MS + MR	7	26.9

3.	MR	3	11
4.	MS + MR + AR	2	7.6
5.	MS + AR	2	7.6
6.	MR + AR	1	3.8
7.	MS + MR + AS	1	3.8
8.	MR + AS + AR	1	3.8

**Mitral Valve Area (MVA) in RHD associated with M.S(21 cases):**

In this study ranges from 0.4 to 2.8 Sq.cms. Most of the cases MVA is < 1Sq.cms (Severe). Isolated MS have less MVA comparatively associated with other valvular lesions.

MVA	No. of Patients	Percentage
Up to 1 Sq.cms	15	66.5
1.1 - 2 Sq.cms	13	23
> 2 Sq.cms	3	9.5

**Tabel No:7 Mitral Valve Area (MVA) in RHD associated with M.S(21 cases)**

**L.A size in 50 cases:** In this study L.A. Size ranged from 3 cm to 7.8 cm. Most of the cases the L.A. size was 4 - 5 cm (56%). Large L.A. Commonly associated with Regurgitant valvular lesions (MR).

**Tabel No:8 L.A size in 50 cases**

L.A. Size	No. of Patients	Percentage
< 4 cms	13	26
4 - 5 cms	28	56
> 5 cms	9	18

**Clots in Cardiac Chambers L.A. / L.V:** In this study out of 50 cases 7 cases (14) have clots. Out of 7 cases 6 cases were of Rheumatic aetiology, in that 3 cases were of left atrial clot, 2 cases were of left atrial appendage clots and 1 has vegetation's over AML. Out of 7 cases 1 case was CAD and had large soft clot in left ventricle

**Tabel No:9 ECG CHANGES**

Ventricular Rate	No. of Patients	Percentage
< 100	20	40
100 -150	25	50
> 150	5	10

In this study **RATE** ranged between 60 – 180/min. Most of the cases showing (60%) tachycardia. 10% cases showing rate > 150/min. Cases of RHD were showing tachycardia comparative to other causes.

**QRS (in horizontal plane)** Normal –20 (40%), RAD - 26 (52%), LAD-4 (8%). Most of the RHD cases were showing RAD & RVH. HTN cases were showing LVH.

**Ventricular Hypertrophy** RVH – 20 (40%), LVH - 6 (12%).

#### **Complications in 50 Cases of A.F:**

CCF is the most frequent (60%) complication encountered. The incidence of stroke is also high (14%). All cases were of Rheumatic aetiology. In 6 cases of hemoptysis, 4 cases were of Rheumatic, 1 case of CAD, 1 case of Constrictive pericarditis aetiology. 2 cases of infective endocarditis are of Rheumatic aetiology.

**Tabel No:10 Complications in 50 Cases of A.F**

Sl. No.	Complications	No. of patients	Percentage
1	CCF	30	60
2	Angina	16	32
3	Embolic stroke	7 (2 TIA)	14
4	Hemoptysis	6	12
5	Infective endocarditis	2	4

**Discussion:**

The study population comprised of '50' patients with electrocardiographic documented 'AF' during the period of February 2017-October 2018 in MGM Hospital, Warangal, Telangana, India.

**Age and Sex Distribution<sup>11</sup>:** In our present study, atrial fibrillation was seen more in the patient's age group below 50 years. According to Paul Wood and Lip G Y H, Golding DJ majority of people fibrillated after the age of 50 Years. In ATRIA study (AnTicoagulation and Risk factors in AF) 45% were aged > 75 yrs. In Rotterdam study of prevalence, incidence and life time risk of AF, prevalence of AF increased with age.

This difference is because of aetiological cause of A.F. In our study rheumatic aetiology is common but in above mentioned studies HTN, IHD was common aetiology. In ATRIA and Rotterdam study AF was more common in men than in women (Aetiological difference). According to Lok NS, Lan CP the ratio of female to male is 1.8: 1. In our study the sex ratio of female to male is 1.2:1; showing female preponderance. Common cause of AF in women < 50 years is RHD, Common causes for A.F. in males > 50 yrs. are non-rheumatic. This is collaborated with other studies.

**Clinical Presentation<sup>12</sup>:** In present study dyspnoea (88%), palpitations (80%) were most common presentation, Stroke was observed in 14% cases. In ALFA study by S. Levy, M. Marek, L. Guize, in France (Clinical presentation and underlying conditions in AF) palpitations (79%) was common presentation. In Lok Ns, Lau CP study dyspnoea (38.1%) palpitations (42.3%) were most common presentation. In S.S.DAS, S.N.Dutta palpitations (90%), effort intolerance (82%), angina (60%), heart failure (28%), stroke was observed (15%).

**Aetiological Incidence:<sup>13,14,15,16,17</sup>**

Author	No. of Cases	RHD %	IHD %	HTN %	Others %
Kannel et.al (Framingham Study)	98	17	10	47	-
Hinton et al	333	30	51	10	10
Hansberg	642	14.8	13.4	47.5	24.3
Lok NS, Lau CP	291	17.5	-	28.9	-
Lib Gy, Golding DJ	111	-	28.8	36.9	-
Raman TK (Madras)	100	58	33	3	6
S. Sharma, S. Josh' (N.Delhi)	70	60	24	4.2	11.8
Present Study	50	52	14	10	24



There is a significant variation in the incidence of various causes between first five studies and last two studies. The RHD is the most common cause of AF in our country where as in west IHD & HTN is the commonest cause. According to ICMR research report the national incidence of RHD is 6 per 1000 population. Hospital based studies from all over the India show RHD ranging from 26.6 to 60 (average 40).

**Valvular Affection in RHD with AF:** In our present study AF in RHD occurred in 34.6% of patients with isolated MS, in 11.5% of patients with isolated MR. Combination lesions (26.9%) in MS + MR, 7.6% in MS+MR+AR, 7.6% in MS+AR and 3.8% in MR+AR. In Dicker E study 29% of patients were with isolated MS and 16% of patients were with isolated MR. In our study combination of the lesion are common.

**MVA in RHD associated with MS:** In our present study Mitral Valve Area (MVA) ranges from (0.4 to 2.8 sq.cm). Most of the cases of AF associated with MVA is less than 1 sq.cm (severe). Isolated MS have less MVA as comparatively associated with other valvular lesions.

**Left Atrial Size:** In our present study LA size ranged from 3 cm to 7-8 cm. In most of the cases the LA size between 4-5 cm (56%). Large LA commonly associated with regurgitations (MR). In the study of Left Atrial diameter in AF, echo study (SPAF Investigators) DiHrich HC, Pearce LA, A Singer RW, the mean left atrial diameter was  $47 \pm 8$  mm. In Høglund C, Rosenhanrg (Echo study) of left atrial size  $> 4-4.5$  cm was associated with recurrent intermittent AF. In study of WL Henry, J. Morganroth, AS Personal and Clark (relation between echo cardiographically detected left atrial size and AF). Left atrial dimension  $> 40$  mm common in AF, if LA  $> 45$  mm Cardioversion unlikely to be successful.

#### **Clots in Cardiac Chambers:**

In our study out of 50 cases. 7 cases have clots in left atrium (14%). Out of 7 cases 6 cases are of rheumatic aetiology, in that 3 cases were of left atrium clot, 2 cases were of left atrial appendage clots and one case has vegetations over AML. Out of 7 cases, one case is IHD, has large soft clot in left ventricle. Two cases presented with stroke and 2 cases with infective endocarditis. In study of Gleen Davidson and Philip Grenland (about predictors of left atrial thrombus in mitral valve disease in AF), MS patients with AF had a preponderance of left atrial thrombus of 18%. MS with sinus rhythm had 2.4% + 3.3% preponderance of left atrial thrombus. In MR with AF the preponderance of left atrial thrombus is 0.7%. In TEE study of left atrial body, LAA clot in patients with mitral valve disease in AF by Srimannarayana. 3; Varma R.S; Sathesh. S; Anil Kumar; left atrial clots were found in 33% of patients with mitral valve disease with AF.

#### **ECG Changes:**

In this study most of the cases showing (60%) tachycardia with ventricular rate  $> 100$ /min. 10 cases showing ventricular rate  $> 150$ /min. RHD cases showing high ventricular rate, comparative to other causes. Most of the RHD cases showed RAD and RVH. HTN cases were showing LVH.

**Complications in 50 Cases of A.F.:**

In our study, CCF (60%) is most frequent complication, followed by Angina (32%). Other major complications are stroke (14%), Hemoptysis (12%) and Infective endocarditis (4%). In most of the stroke patients the aetiology was rheumatic. In Lip GU Golding DJ study the common complications are CCF (30.6%) and stroke (18%).

**Conclusion:** From the results it can be concluded that Atrial fibrillation due to rheumatic aetiology is more common in younger age group, while that due to other causes like hypertension, ischemic heart disease common in older age. Females are commonly affected than males. Rheumatic heart disease is commonest cause followed by ischemic heart disease, Hypertension, DCM.

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