



**A STUDY OF ETIOLOGY OF ATRIAL FIBRILLATION IN A TERTIARY CARE  
MEDICAL CENTRE IN INDIA**

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## INTRODUCTION

The atrial fibrillation (AF) is the most common sustained arrhythmia encountered in clinical practice,<sup>[1]</sup> essentially this is a disorder of atrial origin and is usually associated with absolute irregularity of ventricular action.

Atrial fibrillation (AF) is a major public health problem worldwide with a global prevalence of 0.47% with most data from developed countries.

The prevalence of AF in the western world is 1.5–2% in the general population and the average age of the AF patient is between 75–85 years.<sup>[2]</sup>

The global burden of atrial fibrillation (AF) is ever increasing and it is the commonest arrhythmia. It is now well established that AF worsens symptoms, quality of life and requires frequent hospitalization and has a higher mortality.<sup>[3,4]</sup>

There is no definite coordinated universal atrial contraction or relaxation instead there are irregular dissociated large contraction at about 350-400/ Minute which produce worm like (fibrillary) quivering of atria without an effective atrial contraction. Atrial fibrillation is associated with various degrees of atrioventricular block but because of the more rapid atrial rates in fibrillation very few impulses can reach or excite the ventricle and because the atrial rhythm is irregular the ventricular rhythm is also irregular. Usually the ventricular rate varies between 100-160/minute because only one out of three or four atrial impulse can gain access to the ventricles because of atrioventricular block. AF is associated with 15% of all strokes. Prospective trials have shown a reduction in risk by two-third in patients with stroke who are adequately anti-coagulated.<sup>[5]</sup>

The ultimate aim of our study is to find out the incidence of AF and its relationship with variables like age, gender and etiology (focusing on RHD).

## MATERIAL AND METHODS

Hundred (100) indoor patients from all the patients admitted to medical wards in PDU Medical College and hospital, Rajkot, Gujarat, during November 2014 to April 2016 having Atrial Fibrillation comprise the sample population for the present study.

Those patients who were clinically suspected to have atrial fibrillation but left hospital against medical advice were excluded from present study. (Exclusion criteria).

Data collection was done using a detailed pro forma consisting of following information of each patient Complaints like palpitation, dyspnoea, syncope, chest pain, cough, haemoptysis, fatigue, cyanosis and oedema feet were noted.

**History:** Past history (rheumatic fever, rheumatic chorea, Hypertension, diabetes mellitus, thyrotoxicosis and myocardial ischemia. In female patient history regarding number of Pregnancies, complication and cardiovascular complication or cardiac failure during pregnancy were noted.), Personal history (Diet, tea, smoking and alcohol).

**Physical examination:** general examination comprising of pulse, blood pressure, jugular venous pressure, oedema feet, presence of cyanosis, thyroid swelling anemia and state of nutrition were noted. Examination of cardiovascular system include pulse (rate &rhythm), Apex beats, pulse apex deficit, position and character of apex beat, presence of any thrill and murmur its character, site, conduction and intensity of heart sounds, presence of pericardial rub etc. was carried out. Respiratory system, alimentary system and nervous system examination was performed in detailed and emphasis was made on evidence of cardiac failure and cerebrovascular complications. Fundus examination was

done in patient who developed cerebrovascular complications.

**Laboratory investigation:** Routine haemogram and urine analysis were done in all the cases. Standard twelve lead electrocardiogram was taken in each case. Serum cholesterol, liver function tests, blood urea, serum creatinine, serum T3 T4 TSH were estimated in selected patient.

Follow up of the patient was done for a period of six months to know whether ventricular rate was controlled or not and whether the patients relieved of presenting symptoms, whether they have developed any complication like systemic or pulmonary embolism or had any side effects of the drug treatment.

The diagnosis of atrial fibrillation was based on clinical findings and confirmed by electrocardiogram were included. Following parameters were used:

1. Irregularly irregular pulse and/or heart rate with apex pulse deficit of more than ten per minute.
2. ECG showing presence of atrial fibrillation.

## RESULTS

Total number of patients admitted among various medical wards were 46323 among which 1382 were cardiac Patients out of which 712 were males, in these 31 patients had Atrial Fibrillation and 670 were females among these 69 had AF (Total 100 cases of AF).

**Table 3: Various Etiologies of AF (n=1382).**

Etiology	Male Patients with AF	Male Patients without AF	Female Patients with AF	Female Patients without AF
RHD	16	216	49	164
IHD	12	187	7	179
Hypertension	2	174	7	169
Others	1	104	6	89
Total	31	681	69	601

Table no.3 shows that 16 male patients and 49 female patients had Rheumatic Heart Disease as the cause of AF

whereas 15 male and 20 female patients had other etiologies as the cause of AF.

**Table 1: Showing Age Distribution in Patients Of Af (n=1382).**

Age	Patients with AF	Patients without AF
<40	21	180
41-50	24	312
51-60	18	372
>60	37	418
Total	100	1282

Table no. 1 shows that maximum number of patients having AF were above the age of 60 years (37%).

**Table 2: Relationship of Gender in Patients of AF (n=1382).**

Incidence	Male	Female	Total
Patients with AF	31	69	100
Patients without AF	681	601	1282
Total	712	670	1382

Table no. 2 shows that incidence of AF was more than twice in female patients 69% as compared to males 31%.

In western countries incidence of AF is more in male patients but in India incidence in female is high because here RHD is the commonest cause of AF.

**Table 4: Association of af With Gender, Age And Etiology (n=1382).**

Factors		AF+	AF-	Total	$\chi^2$ value	df	p- value
Gender	Male	31	681	712	18.172	1	<b>0.00002</b>
	Female	69	601	670			
	Total	100	1282	1382			
Age	<40	21	180	201	7.628	3	0.0544
	41-50	24	312	336			
	51-60	18	372	390			
	>60	37	418	455			
	Total	100	1282	1382			
Etiology	With RHD	65	380	445	53.124	1	<b>0.0000</b>
	Without RHD	35	902	937			
	Total	100	1282	1382			

Table no.4 shows that there is a significant association ( $p<0.05$ ) between gender and etiology in AF patients. In

India Females patients were relatively more than males because RHD is more prevalent in Females.

**Table 5: Relationship Between Gender, Age And Presence Of Rhd Etiology In Cardiac Patients With AF (n=1382).**

Factors		With RHD	Without RHD	Total	$\chi^2$ value	df	p-value
Gender	Male	16	15	31	3.539	1	0.0599
	Female	49	20	69			
	Total	65	35	100			
Age	<40	16	5	21	4.96	3	0.175
	41-50	17	7	24			
	51-60	13	5	18			
	>60	19	18	37			
	Total	65	35	100			

Table no. 5 shows the relationship of gender and age with RHD as the etiology in patients with AF. The values depicts no significant association ( $p>0.05$ ) between RHD and either Gender or age.

## DISCUSSION

As per present study the incidence of AF in total no. of cardiac cases was 7.26 %.

These findings are consistent with findings of other studies like 10% in Rana (1965),<sup>[6]</sup> 7.15% in Prakash & Chugh (1973),<sup>[7]</sup> and 11.2% by Jani et al.<sup>[8]</sup>

Atrial fibrillation is known to occur at all ages however incidence of AF varies with the age.

In present study the highest incidence was seen in patients above 60 years 37% followed by 24% between 41 to 50%.

Kanel et al.<sup>[9,10]</sup> reported highest incidence between the age group of 31 to 40 years (37.68%), while Prakash et al.<sup>[7]</sup> reported higher incidence (38.11%) between the age group 21 to 30 year. Jani et al.<sup>[8]</sup> reported almost equal distribution ranging from 16 to 20 % below the age of 60 years. The incidence of AF was 4.88% in study by Prakash et al.<sup>[7]</sup> and 10.00% in study done by Jani et al.<sup>[8]</sup> in patients over 60 years. Kannel et al reported similar distribution of after the age of 60 years (14.99%).<sup>[9]</sup>

In majority of the Indian studies there were female preponderance while in majority of foreign studies there were male preponderance. This difference is due to relative frequency of underlying disease in various countries for development of AF. In western countries ischemic heart disease among old aged males is the major etiological factor while in underdeveloped countries RHD is major contributor which is more common among female patients.

Our study also showed that that more females (69%) were affected than males (31%). Similar findings were reported by Daljeet Kaur Sagg, (62.5% Females) in Nagpur, India.<sup>[11]</sup>

Helpern et al. reported 57% male patients in western studies.<sup>[12]</sup>

In present study rheumatic etiology was found in 65% patients. Similar findings were reported by other Indian studies like Rana et al. 67%,<sup>[6]</sup> Prakash et al. 91%.<sup>[7]</sup> and Jani et al. 70%.<sup>[8]</sup>

In western countries rheumatic etiology was found in 20% Hurst et al.,<sup>[13]</sup> 70% Lown et al.<sup>[14]</sup> 23% by Fenster et al.<sup>[15]</sup>

Frequency of ischemic heart disease in cases of AF is very high in western countries as reported by Hurst 34%,<sup>[13]</sup> Fenester 34%.<sup>[15]</sup>

Ischemic heart disease was cause of AF in 19% of cases in present study. This finding is also similar as reported by other Indian studies like Rana et al. 10%,<sup>[6]</sup> Prakash et al. 6%,<sup>[7]</sup> Jani et al. 6%.<sup>[8]</sup>

Hypertension as a cause of AF was found in 9% cases in present study. Similar finding was reported by Rana et al. 10%.<sup>[6]</sup>

In western studies Hurst et al.<sup>[13]</sup> reported hypertension as a cause of AF in 16.9% cases but Fenster et al.,<sup>[15]</sup> found it in only 11% cases.

Pulmonary cause especially C.O.P.D. was also reported in 2 % to 6% by Lown et al.,<sup>[14]</sup> Jani et al.,<sup>[8]</sup> Prakash et al.,<sup>[7]</sup> reported 4%, 6% and 2% respectively. In the present study C.O.P.D. was encountered in only 1% of patients.

## CONCLUSION

- (1) More than half (55%) patients were above the age group of 50 years, (out of which 37% were above the age of 60 years) while 45% were below 50 years of age. In west majority of patients are above 60 years of age.
- (2) Females were affected more (69%) than males (31%) because RHD is commonest cause of AF in India. Male to female ratio was 2.2:1. In western

- countries AF is more common in males as compared to females.
- (3) Most common etiological factor of atrial fibrillation was rheumatic heart disease, this was present in 65% of the patients, whereas 33% patients had other cardiovascular causes. This group included Ischemic heart disease (19%), hypertensive heart disease (9%) and cardiomyopathy (5%). Among Non-Cardiac causes thyrotoxicosis and chronic obstructive pulmonary Disease occurred in 1% patient each.

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