

A Study of Underlying Cardiac and Non-Cardiac Risk Factors in Patients with Atrial Fibrillation.

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Atrial fibrillation (A Fib) is associated with high incidence of morbidity and mortality. Numerous cardiac and non-cardiac risk factors for A Fib have been identified. We evaluated different patients of A Fib to find out both cardiac and non-cardiac risk factors for its occurrence. We studied 100 (44 males, 56 females) patients of A Fib and divided them into cardiac and non-cardiac groups. Eighty six (86%) patients (49 females, 37 males) were in cardiac group, out of which 49 (57%) had valvular heart disease (32 females, 17 males), 17 (20%) coronary heart disease (CAD) and 13 (15%) hypertension. Out of 14 (14%) patients of non-cardiac group 7 (50%) had lone A Fib and 7 (50%) had thyrotoxicosis, severe infection and chronic obstructive pulmonary disease. A Fib is the commonest chronic or recurrent arrhythmia whose incidence raised with age. Gender also affected it as female dominance was seen, consistent with other studies. Rheumatic heart disease was observed the main risk factor as compared to Western World where CAD and hypertension dominate. Lone A Fib was seen in comparable number with international data. Early recognition and treatment of these risk factors may help to reduce the occurrence of atrial fibrillation and its associated sequelae.

Key Words: Atrial fibrillation, Risk Factors, Cardiac, Non-cardiac.

Introduction

Prevalence of atrial fibrillation (A Fib) is 1% in the United States and the incidence increases with age, rising upto 10% over the age of 70 years¹⁻³. Atrial fibrillation is associated with high incidence of morbidity such as stroke, syncope and heart failure.⁴ The mortality from embolic stroke is considerably high in patients with atrial fibrillation (23%) when compared with patients in sinus rhythm (8%).⁵ Early diagnosis and proper management prevent long term complications associated with it¹. It is standard clinical practice to restore sinus rhythm and that if maintained would be associated with less long-term morbidity (fewer strokes, improvement of heart failure status including hospitalization for heart failure).

Numerous cardiac and non-cardiac risk factors for atrial fibrillation have been identified. In Western population hypertensive and ischemic heart diseases are at the top in causing atrial fibrillation, whereas rheumatic heart disease and thyrotoxicosis are declining in number.^{1,2}

The recognition of risk factors is important, as modification and treatment of these have additional benefits in not only reducing the incidence of atrial fibrillation but instituting the timely treatment would decrease the morbidity or mortality associated with this arrhythmia.⁶

Materials and Methods

This study was conducted in East Medical Ward of Mayo Hospital, Lahore, during February 1998 to March 1999. One hundred (100) consecutive patients presenting to Emergency Department or Out-door found to have an irregular pulse on examination or A Fib found on ECG for any reason were included in the study. A detailed history and systemic examination were recorded.

Echocardiography was performed in every case of A Fib. Thyroid function tests were performed only in selected patients or in patients having lone atrial fibrillation.

Aims and Objectives

1. To diagnose the cases of atrial fibrillation.
2. To find out both cardiac and non-cardiac risk factors for atrial fibrillation.

Statistical Evaluation

The arithmetic mean of the observations was first calculated. The standard deviation and significance were than calculated with the help of Student's t test.⁷

Results

A total of one hundred (100) patients with atrial fibrillation were included in this study. There were 44 (44%) male and 56 (56%) female patients. The patients were divided into two groups, cardiac and non-cardiac, depending upon the etiology of A Fib. There were 86 (86%) patients in cardiac group, among them 37 (43%) were male and 49 (57%) female. In the non-cardiac group there were 14 (14%) patients, among them 7 (50%) were male and 7 (50%) female.

The number of patients varies with age and was distributed in different age groups (table -1).

Risk Factors

These risk factors were divided into two groups, i.e. cardiac group and non-cardiac group. In the cardiac group majority of patients were having A Fib due to valvular heart disease i. e. 49 cases. Among these 23 (47%) patients had history of rheumatic fever in the past, while 26 (53%) had no history of rheumatic fever. In valvular group, the pure mitral stenosis was the predominant lesion being present in 38 (77.55%) patients out of these, 23 were female and 15 male patients. It showed that mitral stenosis is predominant lesion in female patients. Mitral stenosis combined with mitral regurgitation was found in 7 (14.30%) patients and mitral stenosis with aortic stenosis was found in 2 (4.08%) patient. Two (4.08%) patient had pure mitral regurgitation, (table 2).

In cardiac group hypertension and coronary artery disease were the other risk factors for atrial fibrillation

followed by dilated cardiomyopathy, pericardial effusion and constrictive pericarditis, (table 2).

In non-cardiac group A Fib was present in 14 patients, out of which thyrotoxicosis was seen in 5 (35%) patients (2 male, 3 females), severe infection in 1 male (7%), COPD in 1 female (7%) and lone A Fib in 7 (50%) patients (4 males, 3 females), (table 3).

Atrial fibrillation was associated with 2 major complications i.e., haemodynamic derangement and risk of embolisation. In our study, 57 (57%) patients presented with symptoms of heart failure and 7 (7%) patients presented with thromboembolic complication. Out of 7 patients with thromboembolic phenomenon 6 had cerebrovascular accident confirmed on CT examination and one patient had peripheral embolus, confirmed by Doppler flow study of ischemic limb. Out of 7 cases that presented with thromboembolic event, 3 belonged to valvular heart disease. Thirty-six (36%) patients had no complications.

In this study there were 44 (44%) male patients and 56 (56%) were female patients. This was more or less consistent with some of other internationally conducted studies. The rheumatic valvular disease accounted for 49 (57%) patients for atrial fibrillation which was different from other internationally conducted studies (table - 4).

Discussion

Atrial fibrillation is the commonest arrhythmia. Its incidence is age related, increases with advanced age up to 10% over 70 year as shown by various studies.^{2,3,9} In our study the maximum number of patients were in their 60's. This is because cardiac risk factors increase as the age advances. The number of patients was less in seventies and in eighties. This was probably because of average life expectancy in our country is less as compared to the Western countries. Hypertension and coronary artery disease were two major risk factors in elderly people because these patients had higher mean age.

Gender also affected the incidence of atrial fibrillation and it was found more frequently in female as compared to male (56% Vs 44%). This is more or less consistent with other studies.^{6,10}

We found rheumatic valvular heart disease to be the main risk factor for atrial fibrillation because 49% of our patients had history of rheumatic fever, and quite different from other internationally conducted studies.^{2,6,8,10} Rheumatic valvular heart disease and mitral stenosis are predominant in female. This was found to be true in our study as well.¹¹

The incidence of hypertension and coronary heart disease were low in percentage as compared to other international studies.^{6,8} The reason is probably that hypertension and coronary artery disease are common in Western countries where as rheumatic valvular heart disease is common in our country.

The incidence of lone A Fib is quite variable in different studies. In our study lone A Fib accounted for 13.7% of non-valvular group which is quite comparable with Gelder's 1991 study, who found that 15% of his

atrial fibrillation were of lone atrial fibrillation.⁸

The main risk factors were rheumatic valvular heart disease, hypertension and coronary artery disease. Early recognition and treatment of these factors may help to reduce the occurrence of atrial fibrillation. Hypertension and coronary artery disease were other two main factors for the development of atrial fibrillation. Hypertension and coronary artery disease usually coexist. The risk factors for the development of hypertension and coronary artery disease are more or less the same. The modification and proper control of these factors are essential.

As A Fib is associated with increase incidence of thromboembolic and haemodynamic complications, the need for converting A Fib to sinus rhythm is important.¹² It has also been shown that paroxysmal A Fib itself increased haemoconcentration, enhanced platelet aggregation and coagulation, so may increase the incidence of thromboembolism.¹³ That is why, patients of chronic atrial fibrillation should include anticoagulant treatment.

In some cases of A Fib it is difficult to convert into sinus rhythm by chemical or electrical means. This is especially so in cases of chronic A Fib, having large LA size. In such cases physician should prescribe rate-controlling drugs alongwith anticoagulant treatment to prevent thromboembolic complication.

Table No. 1 Number of Patients in Different Age Groups

Age Group	Male	Female	n=
20-29	4 (4%)	5 (5%)	9 (9%)
30-39	9 (9%)	12 (12%)	21 (21%)
40-49	6 (6%)	10 (10%)	16 (16%)
50-59	6 (6%)	7 (7%)	13 (13%)
60-69	11 (11%)	16 (16%)	27 (27%)
70-79	7 (7%)	1 (1%)	8 (8%)
80-89	1 (1%)	5 (5%)	6 (6%)
n=	44 (44%)	56 (56%)	100 (100%)

Table No. 2 Sub-Classification of Risk Factors in Cardiac Group

Risk Factors	Male	Female	n=
Valvular Heart Disease	17 (20%)	32 (37%)	49 (57%)
Mitral Stenosis	11	16	27
CAD	14 (16.4%)	3 (3.5%)	17 (20%)
HTN	5 (5.8%)	8 (9.3%)	13 (15%)
DCM	0 (0%)	3 (3.4%)	3 (3.4%)
Pericardial effusion	2 (2.3%)	0 (0%)	2 (2.3%)
Constrictive pericarditis	0 (0%)	2 (2.3%)	2 (2.3%)

CAD = Coronary artery disease.

HTN = Hypertension

DCM = Dilated cardiomyopathy

Table No. 3. Sub-classification of risk factors in non-cardiac group

Risk Factors	Male	Female	n=
Lone A Fib	4 (28.6%)	3 (21.4%)	7 (50%)
Thyrotoxicosis	2 (14.3%)	3 (21.4%)	5 (35.7%)
Severe Infection	1 (7.15%)	0 (0%)	1 (7.15%)
COPD	0 (0%)	1 (7.15%)	1 (7.15%)

COPD= Chronic Obstructive Pulmonary Disease

Table No. 4.comparison of percentage of risk factors in some of the internationally conducted studies

Author	Year	Risk Factors	
		VHD	NVHD
Kannel et al ²	1982	18%	82%
Gelder et al ⁸	1991	31.1%	68.3%
Benjamin et al ⁶	1994	23.1%	76.9%
Tahir and Ahmad ¹⁰	1996	34.5%	65.5%
Our study	1999	57%	43%

VHD:Valvular Heart diseases
 NVHD: Non-valvular heart diseases

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