



FREQUENCY OF LEFT ATRIAL ENLARGEMENT IN PATIENTS WITH PERSISTENT NON VALVULAR ATRIAL FIBRILLATION

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ABSTRACT

OBJECTIVE: The objective of this study was to determine the frequency of left atrial enlargement in patients with persistent non valvular Atrial Fibrillation

MATERIALS AND METHODS: This cross sectional descriptive study was conducted at Post Graduate Medical Institute Hayat Abad Medical Complex, Peshawar from March 2014 to September 2014. A total of 195 consecutive patients with persistent non-valvular atrial fibrillation were included in the study. All the patients underwent 2D Echo for left atrial size. Data was collected using a pre-formed proforma and analyzed with SPSS version 20.

RESULTS: A total of 195 patients with non-valvular persistent AF were enrolled in this study. There were 125 (64.1%) male and 70 (35.9%) female patients. The mean age of the patients was 57.49 ± 8.72 years. Left Atrial enlargement was found in 113 (57.9%) patients. Among these 113 patients 82 (72.56%) were male, and 31 (27.4%) were female.

CONCLUSION: Left atrial enlargement is a common finding in patients with non valvular persistent Atrial Fibrillation. It should be part of complete ECHO assessment of the heart and timely identified in order to prevent the long term complications of LA enlargement.

KEY WORDS: Atrial Fibrillation, Non-Valvular, Left atrium

INTRODUCTION

Atrial Fibrillation (AF) is defined as an arrhythmia with absolutely irregular RR intervals with no distinct P waves on the surface ECG and the interval between two atrial activations (atrial cycle length, when visible), is usually variable and less than 200 milliseconds (more than 300 beats per minute)¹. AF is considered as persistent when the episode of AF lasts longer than 7 days or requires electrical or chemical cardioversion². AF is the most common arrhythmia managed in clinical practice and its incidence increases sharply with age. The prevalence of AF is 0.5% at the age of 40 to 50 years, while it increases up to 5 to 15% at 80 years. AF affects men more often than women¹.

Among the stressors for the atrial myocytes the most common is the duration of AF. A longer duration of AF causes more atrial dilation³. Studies have reported that 55% of patients with AF develop LA enlargement⁴. AF is considered as an independent risk factor for stroke while this risk increases up to 5 times when you compare it with cases without AF. Studies have shown that LA enlargement is a predictor of Spontaneous Echocardiographic Contrast

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and thrombus in LA in patients with paroxysmal and chronic AF. So the thrombus in LA is a potential risk for the occurrence of stroke⁵.

LA enlargement by itself is a predictive factor for the occurrence of stroke even in people with no evidence of AF⁶. Studies have reported the prevalence of stroke in patients with AF ranging from 6.7% to 27% in developing countries. The utilization of anticoagulants in patients with AF for the prevention of stroke has been reported to be highly variable (2.7% to 72.7%) in developing countries⁷. LA enlargement has also been shown to increase refractoriness to electrical or chemical cardioversion of AF. Previous studies have shown that in patients with severe LA enlargement, the risk for recurrence of AF after Radio Frequency Catheter Ablation (RFCA) is high⁸.

Keeping in mind the above mentioned consequences of LA enlargement in AF, its prevention appears to be a worthwhile therapeutic goal in itself. The rationale of this study would be to find the frequency of LA enlargement in patients with non valvular AF in our population. This will have an impact on preventing the long term complications of AF.

MATERIALS AND METHODS:

It was a descriptive cross-sectional study, conducted at Cardiology Department, Postgraduate Medical Institute, Hayat Abad Medical Complex,

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Peshawar. A total of 195 patients were included in this study using 4.2 cm cut off for LA enlargement for men and 40 cm for women in AF⁴, with 95% confidence level and 7% margin of error using WHO calculator for sample size determination through non probability consecutive sampling.

Patients over the age of 18 of both genders, presenting to Cardiology Unit, Hayat Abad Medical Complex Peshawar, with nonvalvular persistent AF were included in the study. Diagnosis of the patients was based on the patient history, physical examination and electrocardiography (ECG) findings.

Patients with congenital heart disease, moderate to severe valvular heart disease, mechanical or bioprosthetic heart valves, ejection fraction <45%, permanent pacemaker and history of ischemic heart disease were excluded from the study, because each one of them leads to LA enlargement by itself.

DATA COLLECTION PROCEDURE:

The study was conducted after approval from hospitals ethical and research committee. All patients meeting the inclusion criteria were included in the study through OPD and emergency. The purpose and benefits of the study was explained to all patients and a written informed consent was obtained.

All patients were subjected to detailed history, followed by complete routine examination and investigations including ECG (Cardiofax) and Echocardiography. Echocardiography was performed in the left lateral decubitus position with Toshiba TA 700 system and a PST 25BT (2.5 MHz) probe. Views were taken in the parasternal long axis view to measure LA size. Echocardiography was performed by a single operator and confirmed by senior consultant.

All the above mentioned informations including demographic features were recorded in a pre designed proforma. Strictly exclusion criteria were followed to control confounders and bias in the study results.

The collected data was stored and analyzed in SPSS version 20 for windows. Mean + SD was calculated for numerical variables like age and LA size. Frequencies and percentages were calculated for categorical variables like gender etc. LA enlargement was stratified among the age and gender to see the effect modification. All results were presented in the form of tables and graphs

RESULTS:

A total of 195 patients with non valvular persistent AF were enrolled in this study. There were 125

(64.1%) male and 70 (35.9%) female patients. The mean age of the patients was 57.49 ± 8.72 years. Age distribution among 195 patients was as follow. 6 patients (3.1%) were 40 years or below, 33

Table 1. Age distribution (n=195)

AGE IN YEARS	FREQUENCY	PERCENTAGE
40 years or below	6	3.1%
41-50 Years	33	16.9%
51-60 Years	69	35.4%
61-70 Years	74	37.9%
Above 70 years	13	6.66%
Total	195	100%

Table 2: Association of LA enlargement and gender distribution (n = 113)

LEFT ATRIAL ENLARGEMENT	FREQUENCY (%)	MALE (%)	FEMALE (%)
Present	113(57.9)	82 (72.56)	31(27.4)
Absent	82(42.1)	54(65.8)	28(34.2)

TABLE 3: Distribution of left atrial enlargement in different age groups (n = 113)

AGE IN YEARS	FREQUENCY	PERCENTAGE
40 years or below	1	0.88%
41-50 Years	4	3.5%
51-60 Years	29	25.66%
61-70 Years	66	58.4%
Above 70 years	13	11.5%
Total	113	100%

patients (16.9%) were 41 to 50 years, 69 patients (35.4%) were 51 to 60 years, 74 patients (37.9%) were 61 to 70 years, and 13 patients (6.66%) were in above 70 years age group. (Table no. 1)

Left Atrial enlargement was found in 113 (57.9%) patients. Among these 113 patients 82 (72.56%) were male, and 31 (27.4%) were female (Table no2). Age distribution among these 113 patients was as follow. 1 patient (0.88%) was 40 years or below, 4 patients (3.5%) were 41 to 50 years, 29 patients (25.66%) were 51 to 60 years, 66 patients (58.4%) were 61 to 70 years, and 13 patients (11.5%) were in above 70 years age group. (Table No. 3).

Among 113 patients with LA enlargement the gender distribution among different age groups was as under. In the age group 40 years or below 1 patient (0.88%) was male and there was no female patient in this age group. In the age group 41 to 50 years 4 patients (3.5%) were males and there was no female patient in this age group. In the age group 51 to 60 years 26 patients (23%) were males



and 3 patients (2.65%) were females. In the age group 61 to 70 years 43 patients (38.05%) were males and 23 patients (20.35%) were females. In the age group 70 years or above 8 patients (7.07%) were males and 5 patients (4.42%) were females.

DISCUSSION:

The mean age of our study population with non valvular persistent AF was 57.49 ± 8.72 years which is almost similar to the study done by Camm AJ et al¹. This relatively younger age distribution was probably due to the lower life expectancy in our population as compared to that studied in Camm AJ et al¹. However we did not find similar studies in Pakistan. In a study conducted by Wazakowska⁹ the mean age was 59.3 ± 8.4 years (ranged from 43 to 80 years) which is consistent with our study.

In our study non valvular persistent AF was found more common in males (64.1%) as compared to females (35.9%). Which is consistent with the study done by Camm AJ et al¹.

LA enlargement was found in 57.9% in patients with non valvular persistent AF in our study. This result is comparable with the results from ENGAGE AF-TIMI 48 trial⁴ which studied Left atrial emptying fraction (LAEF), and contractile function along with LA size. They found the LA to be enlarged in 55% of patients. LA enlargement has also been reported in AF in many other studies like Li DS et al¹⁰ and Akdemir B et al³. These studies also reported LA enlargement more in the older age group as more duration of AF results in more enlargement of LA. our study also showed the same results of LA being enlarged more in older population as compared to younger age group.

Baeta Wazakowska et al⁹ also proved in their study that AF causes slow and progressive increase in LA size and a maintenance of sinus rhythm in patients with hypertension, history of AF and those who are treated for AF reverts the process of LA enlargement as the stress for the atrial myocytes in the form of atrial tachycardia like AF is removed.

So achievement of sinus rhythm effectively halts the process of LA remodeling.

Another study conducted by Li D et al¹¹ showed that as atrial dilatation is the hallmark of structural remodeling, atrial arrhythmias, especially AF, are the most common manifestations of LA electrical remodeling. They compared heart failure-induced LA remodeling with atrial tachycardia-induced LA remodeling and showed significant differences in electrophysiological properties between the two groups. The effective refractory period is shortened and the action potential duration is reduced in AF. This contributes to LA electrical remodeling and hence enlargement of left atrium.

In our study we measured the 2D LA diameter in anteroposterior direction because it is simple and convenient but the problem with LA is that it is not a symmetrically shaped three-dimensional (3D) structure, also it is a fact that LA enlargement may not occur in a uniform fashion so a one-dimensional assessment is likely to be an insensitive assessment of any change in LA size. That's why some studies like Walter P. Abhayaratna et al¹² preferred to measure LA volume by two-dimensional (2D) or 3D echocardiography instead of LA diameter as it provides a more accurate and reproducible estimate of LA size, when compared with reference standards such as magnetic resonance imaging (MRI) and computerized tomography (CT). Further studies will be needed especially in our local setup to cover such shortcomings in our study.

Left atrial enlargement is a common finding in patients with non valvular persistent Atrial Fibrillation. It should be part of complete ECHO assessment of the heart and timely identified in order to prevent the long term complications of LA enlargement.

CONCLUSION:

Left atrial enlargement is a common finding in patients with non valvular persistent Atrial Fibrillation. It should be part of complete Echo assessment of the heart and timely identified in order to prevent the long term complications of LA enlargement.



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