

Frequency of Atrial Fibrillation in Heart Failure Patients

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ABSTRACT

Background: An increasing number of people around the world suffer from cardiovascular diseases such as atrial fibrillation (AF) and heart failure (HF). Atrial fibrillation (AF) has been linked to poor prognosis in heart failure (HF) patients with mild to moderate LV dysfunction, and it is most prominent in these patients. Despite advancements in care and treatment options like catheter ablation, managing AF is still a therapeutic challenge even with these advances.

Aim/Objective: To determine the frequency of atrial fibrillation in heart failure patients.

Subjects and Methods: This cross-sectional study was conducted on 246 patients at Adult Cardiology, NICVD, Karachi for Six months after approval from 31-08-2019 till 29-02-2020. Patients' consent was obtained verbally before data were collected prospectively. There were 246 patients with heart failure who had been diagnosed and met the diagnostic criteria. An overview of the event's history was gathered, as well as demographic data. Qualitative variables were presented as frequency and percentages, while quantitative data were given as simple descriptive statistics such as mean and standard deviation. A p-value of 0.05 or lower is considered statistically significant. **Results:** A total of 246 patients with heart failure were included in this study. The mean age in our study was 56.78 ± 2.81 years. Whereas, mean BNP and ejection fraction in our study was 1144 ± 87.81 pg/ml and 34.65 ± 4.14 %. 136 (55.3%) were male and 110 (44.7%) were female. Out of 246 patients with heart failure, 52 (21.1%) had atrial fibrillation and 194 (78.9%) did not have atrial fibrillation.

Conclusion: The results of this research demonstrated that a large percentage of heart failure patients had atrial fibrillation. Thus, it is essential to focus on a comprehensive way of management of heart failure and its comorbidities rather than primarily treating the cardiac symptoms.

Keywords: Heart failure and atrial fibrillation.

INTRODUCTION

Atrial fibrillation (AF) is a common arrhythmia, and the number of patients with AF is increasing in many developing countries. AF is associated with increased morbidity and mortality.¹ Advancing age is a prominent risk factor of atrial fibrillation.² Continuous medical and health advancements, such as public health initiatives, medical treatments, and surgical procedures, have slowed the aging process and increased life expectancy for the general population.³ Because of this increased lifespan, age-related illnesses like atrial fibrillation have become more common.³ As atrial fibrillation prevalence and incidence grow across the world,⁴ the number of people affected in the United States is expected to reach between 12 and 15 million by 2050.⁵ In the next ten years, there are known risk factors for developing atrial fibrillation, such as cigarette smoking, alcohol abuse, high blood pressure, obesity, diabetes, myocardial infarction, and heart failure.⁶

Heart failure is a significant and growing global health problem.⁷ The incidence and prevalence of HF (heart failure) in this part of South Asia remain unknown. Only a few estimates are based on data from Western nations' prevalence rates.⁸

There were no population-based HF studies even in developing countries in 2001, according to Mendez and Cowie.⁹ The American Heart Association's 2008 Scientific Statement on the prevention of HF mentions the lack of such data outside of North America and Europe.¹⁰

Concomitant heart failure (HF) and atrial fibrillation

(AF) is common occurrence in the clinic, and the prevalence of HF complicated by AF has been growing. HF and AF influence and encourage one another throughout the pathophysiological process, creating a vicious cycle.¹¹ For HF and AF, many doctors now choose non-drug treatment options due to the negative side effects and ineffectiveness of current medication options. With its benefits in sinus rhythm restoration, cardiac function improvement, and long-term prognosis, catheter ablation (CA) has emerged recently as a new therapeutic option for heart failure (HF) exacerbated by atrial fibrillation (AF)¹². In the western population, however, only around 60% of HF patients with AF had successful ablation, according to a prior meta-analysis research¹³.

Twenty-five percent to thirty-five percent of patients with ADHF admitted to the hospital have AF upon presentation, according to registry and trial data.^{14,15} For as common as it is, the combination of AF and ADHF has received very little attention in research.¹⁵ There is almost no data about the prevalence of atrial fibrillation in heart failure patients from our local population. My study will establish this frequency and will eventually help transform institutional practices.

METHODS AND MATERIALS

This cross-sectional study was conducted on 246 patients at Adult Cardiology, NICVD, Karachi for Six months after approval from 31-08-2019 till 29-02-2020. Patients presenting with heart failure who met the diagnostic criteria,

either gender, and age 20 to 65 years were included while non-consenting, patients with heart failure and supraventricular tachycardia cannot be defined as atrial fibrillation, and post CABG patients with atrial fibrillation were excluded. Consenting patients visiting the Department of Adult Cardiology, NICVD, Karachi fulfilling the inclusion criteria were enrolled in the study. The College of Physicians and Surgeons of Pakistan gave its approval before this research could begin. Informed consent was obtained from all the patients for assigning them to sample and using their data in research. A brief history of demographic information was taken from the patient. All patients who have acute decompensated heart failure presenting to ER, clinics, or decompensate during in-hospital stay inwards and CCU had ECG reviewed to confirm atrial fibrillation, the type was determined by taking a quick history for previous episodes and treatment for it. Atrial fibrillation was detected in the ECGs of these patients by a cardiology fellow of CPSP with at least five years of experience, who oversaw the study. The patient's heart rhythm was tracked by a cardiac monitor during their hospital stay, and their ECG was taken every day and examined by the same cardiologist, who discovered an episode of atrial fibrillation. After informed consent data was collected on predefined proforma.

Data Analysis: Data was analyzed on SPSS Version 20. The numerical variables like age, BNP, and ejection fraction were presented as Mean and Standard Deviation. Frequencies and percentages were calculated for the qualitative variables like gender, diabetes mellitus type 2, obesity status, hypertension, and atrial fibrillation (yes/no). Age, gender, diabetes mellitus type 2, obesity status, and hypertension were used as effect modifiers to examine how

they affected outcome variables. Statistical significance was determined by using the post-stratification chi-square test.

RESULT

A total of 246 patients with heart failure visiting the Department of Adult Cardiology, NICVD, Karachi. Patient age ranged from 26 to 65 years in a sample of 246 patients treated at the facility. For this research, we used 56.78 years as the average age, with a 95% confidence interval of 2.81 years. However, in our study, the mean BNP and ejection fractions were 1144±87.81 pg/ml and 34.65±4.14 % respectively.

Table-1 Descriptive Statistics (n=246)

VARIABLE	MEAN ± STANDARD DEVIATION	MIN-MAX
Age (Years)	56.78±2.81	26-65
BNP (pg./mL)	1144±87.81	1019-1210
Ejection Fraction (%)	34.65±4.14	30-45
Gender:		
Male	136	55.28%
Female	110	44.72%
Age in groups:		
20 to 40 years	20	8.13%
41 to 55 years	90	36.59%
56 to 65 years	136	55.28%
Obesity:		
< 30 Kg/m ²	118	47.97%
> 30 Kg/m ²	128	52.03%
Diabetes Mellitus	202	82.11%
Hypertension	180	73.17%
Atrial fibrillation	52	21.14%

Table-2: Atrial fibrillation according to baseline characteristics (n=246)

Variables	Atrial Fibrillation		Total	P-value
	YES n = 52	NO n = 194		
Age (in Groups)				0.001
20-40	02 (3.8%)	18 (9.3%)	20 (8.1%)	
41-55	12 (23.1%)	78 (40.2%)	90 (36.6%)	
56-65	38 (73.1%)	98 (50.5%)	136 (53.3%)	
Gender:				0.19
Male	32 (61.5%)	104 (53.6%)	136 (55.3%)	
Female	20 (38.5%)	90 (46.4%)	110 (44.7%)	
Obesity:				<0.0001
< 30KG/M2	34 (65.4%)	84 (43.3%)	118 (48%)	
> 30KG/M2	18 (34.6%)	110 (56.7%)	128 (52%)	
Diabetic Mellitus				<0.0001
YES	50 (96.2%)	152(78.4%)	202 (82.1%)	
NO	02 (3.8%)	42 (21.6%)	44 (17.9%)	
Hypertension				0.55
YES	38(73.1%)	142 (73.2%)	180(73.2%)	
NO	14 26.9%)	52 (26.8%)	66 (26.8%)	

As shown in Table 1. Out of 246 patients with heart failure, 52 (21.1%) had atrial fibrillation and 194 (78.9%) did not have atrial fibrillation. Table 1. Out of 246 patients with heart failure, 136 (55.3%) were male and 110 (44.7%) were female. Table 1. Out of 246 patients with heart failure, 20 (8.1%), 90 (36.6%), and 136 (55.3%) patients were in the age group 20-40 years, 41-55 years, and 56-65 years respectively. Table 1. With regards to obesity status showed

that out of 246 patients with heart failure, 118 (48%) and 128 (52%) had obesity status < 30 kg/m² and > 30 kg/m² respectively. Table 1 The distribution of diabetes mellitus type II showed that out of 246 patients with heart failure, 202 (82.1%) and 44 (17.9%) had and did not have diabetes mellitus type II respectively. As presented in Table 2. With regards to hypertension showed that out of 246 patients with heart failure, 180 (73.2%) and 66 (26.8%) had and did

not have hypertension respectively. As presented in Table 2. Stratification for age concerning atrial fibrillation showed that 02 (3.8%), 12 (23.1%) and 38 (73.1%) patients who were in the age group 20-40 years, 41-55 years, and 55-65 years had atrial fibrillation respectively. Among patients aged 20-40, 41-55, and 56-65, only 18 percent (or 9.3%), 78(40.2%), and 50 (50.5%) had atrial fibrillation (P-value 0.01). As presented in Table 2. Stratification for gender concerning atrial fibrillation showed that 32 (61.5%) and 104 (53.6%) who were in the male group had and did not have atrial fibrillation respectively. Among the females, 38.5% had atrial fibrillation, compared to no atrial fibrillation in 46.4% of the population. The significance level was 0.19. Table 2.

Stratification for obesity status concerning atrial fibrillation showed that patients who had < 30kg/m², 34 (65.4%) and 84 (43.3%) had and did not have atrial fibrillation respectively. Whereas patients who had >30kg/m², 18(34.6%) and 110 (56.7%) had and did not have atrial fibrillation respectively (P-value 0.00). Table 2. Stratification for diabetes mellitus type II concerning atrial fibrillation showed that patients who had diabetes mellitus, 50 (96.2%) and 152 (78.4%) had and did not have atrial fibrillation respectively. Whereas patients who did not have diabetes mellitus, 02 (3.8%) and 42 (21.6%) had and did not have atrial fibrillation respectively (P-value was 0.00). Table 2. Stratification for hypertension concerning atrial fibrillation showed that in patients who had hypertension, 38 (73.1%) and 142 (73.2%) had and did not have atrial fibrillation respectively. Whereas patients who did not have hypertension, 14 (26.9%) and 52 (26.8%) had and did not have atrial fibrillation respectively (P-value 0.55). Table 2

DISCUSSION

Taken together, these pathophysiologic events might be expected to lead to major, acute cardiac and neurological events. In this study, of the 246 patients, the mean age in our study was 56.78±2.81 years. Whereas, mean BNP and ejection fraction in our study was 1144±87.81 pg./ml and 34.65±4.14 %. 136 (55.3%) were male and 110 (44.7%) were female. Out of 246 patients with heart failure, 52 (21.1%) had atrial fibrillation and 194 (78.9%) did not have atrial fibrillation. A cross-sectional investigation of incident cases, which included 659 consecutive hospitalizations due to DHF, discovered atrial fibrillation.¹⁶ AF was found in 40% of people, with the majority being of the permanent kind (73.5 percent). As part of a multivariate model, AF was shown to be significantly related with advanced age (p = 0,001), non-ischemic cause (p = 0,02), right heart dysfunction (p = 0,03), lower SBP, greater EF, and a larger LA (p = 0,0001). Ninety percent of the patients had CHADS VA SC scores of 2, with a median of 4. Those with greater coagulation test results had lower anticoagulation rates of 52.8% and 66.8%, respectively. Hospital mortality was greater for those with AF (11,0 percent as opposed to 8,1 percent for non-AF, p = 0,21), as was the duration of stay (additionally 20,5 days as opposed to 16,3 days for non-AF) in the hospital.¹⁶

For instance, in research on atrial fibrillation, researchers found that patients had an average age of 50.9 years, with a range of ages from 19.9 to 75.9 years, and the majority of them (50.0 percent, or 75 patients) were

between the ages of 41 and 65. Age was a factor in the health of just 19.3 percent (29) of patients. 42.7 percent had hypertension; 55.3% had RHDs; and 22.7 percent had had at least one previous stroke or TIA/CVA, all of which increased the likelihood of AF in our research group significantly. The echocardiographic evaluation revealed a clot in the heart in 28.0% of patients and RV dysfunction in 29.3%. Three-quarters of the patients had multiple sclerosis (MS) and two-thirds had magnetic resonance imaging (MRI). Studies show that a family history of RHD's or high blood pressure (HTN) is a major risk factor for heart disease, including AF.¹⁷

Another research revealed that 556 people had been diagnosed with baseline atrial fibrillation (13.9 percent). To keep heart rates down, individuals with atrial fibrillation received the same amount of metoprolol CR/XL (154 mg) as those in sinus rhythm (158 mg) (14.8 and 13.7 bpm, respectively). Patients with atrial fibrillation had a mortality rate of 61 (out of 362) when treated with metoprolol, compared to 31 when treated with placebo (RR 1.0; 95 percent CI 0.61-1.65). As time passed, 85 patients on placebo developed new atrial fibrillation, while 47 individuals on metoprolol developed the condition.¹⁴

Hospitalized heart failure patients in Europe are handled using the Euro Heart Failure Survey. Over six weeks, researchers gathered data on patients at 115 hospitals throughout the world, representing 24 different nations. When it came to this study, patients were divided into three groups based on whether or not they had previously experienced an arrhythmia, such as those who had arrhythmia before being admitted, those who had an arrhythmia for the first time during hospitalization, and those who had never experienced an arrhythmia. Patients' clinical characteristics, such as length of stay and survival status while in the hospital, were analyzed and compared among groups. A total of 6027 (57% of the patients surveyed) had no prior AF, 3673% had previous AF, and 9% experienced new-onset AF. There was a statistically significant difference between patients with new-onset AF and those who had never experienced AF in terms of length of stay in the intensive care unit (ICU). When it came to in-hospital mortality, patients with newly diagnosed AF had a higher rate than those with preexisting AF or no AF (12 percent, 7 percent, and 7 percent, respectively; P 0.001). New-onset AF (not prior AF) was an independent predictor of in-hospital death after controlling for various clinical factors (odds ratio 1.53, 95% confidence interval). the confidence interval is 1.1-2.0.¹⁸

Abnormal electrical activity in the heart, also known as atrial fibrillation, and heart failure, are two of the most prevalent medical disorders. There are several risk factors in common between the two diseases. They also commonly overlap and have additional negative consequences when present at the same time.

CONCLUSIONS

Atrial fibrillation was shown to be prevalent in many heart failure patients, according to this research. The importance of this relationship must be understood by physicians and patients alike if these occurrences are to be promptly recognized and managed. In high-risk groups, prevention strategies for atrial fibrillation must be improved.

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