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NEW ONSET ATRIAL FIBRILLATION AMONG PATIENTS PRESENTING WITH ANTERIOR WALL MYOCARDIAL INFARCTION

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Contribution

RU & AS conceived the idea. MSI & IK planned the study. ZAA & HU drafted the manuscript. All the author contributed significantly in manuscript submission.

All authors declare no conflict of interest.

ABSTRACT

Objective: To determine frequency of new onset atrial fibrillation among patients presenting with anterior wall myocardial infarction.

Methodology: This cross sectional study was conducted at Hayatabad Medical Complex, Peshawar from October 2016 to March 2017.Both male and female patients aged between 35 and 70 years admitted to CCU with anterior wall myocardial infarction were included in the study. Patients with severe co morbid conditions, preexisting left ventricular dysfunction, preexisting atrial fibrillation and stroke history were excluded. ECGs of these patients were analyzed for presence or absence of atrial fibrillation at admission and during hospital stay. Non-probability consecutive sampling technique was used for sample collection.

Results: Our study included 278 patients. Mean age was 57 $\pm$ 7.70 years. Of 278 patients, 180(64.74%) patients were males while 98 (35.25%) patients were females. STEMI patients were 174 (62.58%), whereas 104 (37.41%) patients presented with NSTEMI. Out of 278 patients, atrial fibrillation was recorded in 20 (7.19%) patients. Atrial fibrillation was stratified according to age, gender, type of myocardial infarction, smoking status, obesity, hypertension and diabetes.

Conclusion: Our study concluded that atrial fibrillation complicates acute myocardial infarction which is common in our population, Identification of atrial fibrillation complicating AMI is important not only during hospitalization but also during the follow up period.

Key Words: Atrial Fibrillation, Acute Myocardial Infarction, Stroke.

INTRODUCTION

Atrial fibrillation is a supra ventricular arrhythmia characterized electrocardiographically by low amplitude base line oscillations (fibrillatory or f waves) and irregularly irregular ventricular rhythm which may lead to signs and symptoms of heart failure and serious hemodynamic disturbances. Atrial fibrillation is associated with approximately five-fold increase in the risk of stroke and a two-fold increase in the risk of all-cause mortality.[1] Atrial fibrillation is the most common sustained cardiac arrhythmia with 1% to 2% prevalence in general population.[1] Prevalence of atrial fibrillation in the United Sates ranges from 2.7 to 6.1 million, and in England (1.3%).[2] The prevalence of atrial fibrillation is 6.5% among acute medical admission to hospitals in Pakistan.[3]

Myocardial is chemia is an important cause of atrial fibrillation since rapid and irregular ventricular rates during the arrhythmia may cause decreased cardiac output and further impairment of the coronary circulation leading to left ventricular systolic dysfunction. Atrial fibrillation complicates acute myocardial infarction with an incidence of 6% to 21% and is associated with higher 7- days mortality (5.1) %vs (1.6) %.[4,5]

All types of atrial fibrillation associated with acute coronary syndrome almost doubles the long-term mortality, however short-term mortality varies among sub groups of acute coronary syndrome. New onset atrial fibrillation complicating acute myocardial infarction is associated with adverse in-hospital outcomes with at least 40% increase in the risk of mortality compared with control patients in sinus rhythm.[6-8]

Patients who develop atrial fibrillation during the acute phase of myocardial infarction have more complicated hospital course and higher in-hospital mortality 14.3% compared to those who do not have atrial fibrillation 6.2%.[9]

The aim of study was to look for the frequency of new onset atrial fibrillation in patients with acute anterior wall myocardial infarction. Although review of the available literature shows higher short and long-term complications associated with atrial fibrillation in patients having acute myocardial infarction, but the incidence varies considerably among the studies. Furthermore, limited local data is available on this issue, so the idea behind doing this study was to derive local statistics and the results obtained will be shared with other local cardiologists and formulate future guidelines for the management of those patients who develop atrial fibrillation during acute anterior wall myocardial infarction.

METHODOLOGY

This cross sectional study was conducted at Department of Cardiology of Hayatabad medical complex Peshawar from 1st October 2016 to 31st March 2017. All male and female patients aged 35-70 years admitted in CCU through OPD and A&E department with anterior wall myocardial infarction were included in the study.

Patients with severe co morbid conditions like malignancies, renal failure, COPD, or decompensated liver cirrhosis, preexisting ventricular dysfunction diagnosed on Echocardiography, preexisting atrial fibrillation diagnosed on history, previous ECGs and clinical record and patients with history of stroke were excluded. The purpose and benefits of the study were explained to the patients and a written informed consent was obtained. All patients were subjected to detailed history, followed by complete routine examination and base line investigations including ECG (Cardiofax) and echocardiography (Siemen's Acuson cv-70), and Troponin-l level was done and documented.

ECGs of these patients were analyzed under supervision of single experienced cardiologist fellow of CPSP having minimum of five years' experience, for presence or absence of atrial fibrillation. During hospital stay patient's heart rhythm was monitored on cardiac monitor, and their ECG's was obtained daily and analyzed by same cardiologist and any episode of atrial fibrillation was documented. Strict management protocol was observed for all included patients and all the patients were treated as per CCU protocol under the supervision of same cardiologist.

All the above-mentioned information including demographic features and hospital admission number were recorded in a pre-designed proforma. Strict exclusion criteria were followed to avoid any bias in the data.

The collected data was stored and analyzed in SPSS version 10.0 for Windows. Mean $\pm$ SD was calculated for numerical variables like age. Frequencies and percentages were calculated for categorical variables like age, gender, type of myocardial infarction, smoking status, obesity, hypertension and diabetes mellitus. Atrial fibrillation was stratified among age, gender, type of myocardial infarction, smoking status, obesity, hypertension and diabetes mellitus to see the effect modifications. Post stratification was done through Chi square test using p Ü0.05 was taken significant.

RESULTS

About 278 patients were included in the study with mean age of 57 Years $\pm$ 7.70. As per frequency and percentages for the age, there were 19 (6.83%) in 35-44 Years Age Group, 61 (21.94%) patients were recorded in 45-54 years age group, 131 (47.12%) patients in 55-64 years age group, 67

(24.10%) patients in 65-70 years age group. According to gender distribution, 180 (64.74%) patients were males while 98 (35.25%) patients were females. About 174 (62.58%) had STEMI, whereas 104 (37.41%) patients presented with NSTEMI. Frequency and percentages for smokers were recorded as 61 (21.94%) smokers while 217 (78.05%) patients were nonsmokers. Similarly, 56 (20.14%) patients

were obese. About 171 (61.51%) patients were found hypertensive whereas 107 (38.48%) patients were normotensive,106 (38.12%) patients were having diabetes mellitus while 172 (61.87%) patients non diabetic. Stratification of atrial fibrillation with respect to gender, age, type of myocardial infarction, smoking status, obesity, hypertension and diabetes mellitus is shown in Table 1.

Table 1 . Baseline Characteristics and Stratification of Atrial Fibrillation in Study Population (n=278)

Characteristics		Atrial Fibrillation		p-value
		Present	Not Present	
Age				
	35-44 years	01	18	0.075
	45-54 years	07	54	0.125
	55-64 years	08	123	0.086
	65-70 years	04	63	0.092
Gender				
	Male	14	166	0.279
	Female	06	92	0.137
Type of Myocardial Infarction				
	STEMI	11	163	0.466
	NSTEMI	09	95	0.268
Smoking Status				
	Smoker	08	53	0.157
	Non Smoker	12	205	0.256
Diabetes Mellitus				
	Diabetic	03	103	0.039
	Non Diabetic	17	155	0.008
Hypertension				
	Hypertensive	14	157	0.015
	Normotensive	06	101	0.038
Obesity				
	Obese	01	55	0.050
	Non Obese	19	203	0.165

DISCUSSION

Atrial fibrillation, a supra ventricular arrhythmia may lead to signs and symptoms of heart failure and serious hemodynamic disturbances. Atrial fibrillation is associated with approximately five-fold increase in the risk of stroke and a two-fold increase in the risk of all-cause mortality.[1] It is the most common sustained cardiac arrhythmia with 1% to 2% prevalence in general population.[1] Prevalence of atrial fibrillation in the United Sates ranges from 2.7 to 6.1 million, and in England (1.3%).[2] The prevalence of atrial fibrillation is 6.5% among acute medical admission to hospitals in Pakistan.[3]

In our study of 278 patients, Atrial Fibrillation was documented in only 20 (7.19%) patients. Atrial fibrillation complicates acute myocardial infarction with an incidence of

6% to 21% and is associated with higher 7- days mortality (5.1) %vs (1.6) % (4,5). All types of atrial fibrillation associated with acute coronary syndrome almost doubles the long-term mortality, however short-term mortality varies among sub groups of acute coronary syndrome. New onset atrial fibrillation complicating acute myocardial infarction is associated with adverse in-hospital outcomes with at least 40% increase in the risk of mortality compared with control patients in sinus rhythm. [6-8] Patients who develop atrial fibrillation during the acute phase of myocardial infarction have more complicated hospital course and higher in-hospital mortality (14.3) % compared to those who do not have atrial fibrillation (6.2) %.[1] Moreover, AF is a common finding in patients presenting with an acute myocardial infarction. A meta-analysis pooled data from 43 studies and more than 278,800 patients found that AF in the setting of

acute myocardial infarction was associated with 40% increase in mortality compared to patients in sinus rhythm with acute myocardial infarction.[13]

Besides risks associated with myocardial ischemia, patients with atrial fibrillation are at increased risk of thromboembolism, stroke and heart failure. Patients with atrial fibrillation are 1.5 to 1.9 times at risk of death due to strong relation between AF and thromboembolic events, according to data from the Framingham heart study.[10] Rate vs rhythm control and anticoagulation do not offer any added advantage, according to the Atrial Fibrillation Follow-up Investigation of Rhythm Management (AFFIRM) trial. [11] Development of AF predicts heart failure and is associated with a worse New York Heart Association (NYHA) class. AF may precipitate heart failure in individuals whose output depends on atrial contraction during diastole especially those with hypertensive heart disease and valvular heart disease. Poor rate control in AF may also cause tachycardia mediated cardiomyopathy. In another review studies and meta-analysis studies of death and adverse outcomes in 54,587 patients with AF and concomitant heart failure, investigators reported a significantly higher all-cause mortality in AF patients with reduced ejection fraction compared to those with preserved ejection fraction.[12] However, the rates of stroke and hospitalizations were similar between the groups.

The aim of our study was to look at the frequency of new onset atrial fibrillation in patients with acute anterior wall myocardial infarction. Although review of the available literature shows higher short and long term complications associated with atrial fibrillation in patients having acute myocardial infarction, but the studies varied considerably. Furthermore, limited local data was available on this issue, so the idea behind doing this study was to derive local statistics and now the results obtained will be shared with local cardiologists in order to formulate future guidelines for the management of those patients who develop atrial fibrillation during acute anterior wall myocardial infarction.

CONCLUSION

Our study concluded that Atrial Fibrillation complicates acute myocardial infarction which is common in our population, Identification of Atrial fibrillation complicating AMI is important not only during hospitalization but also during the follow up period. This study has provided us the local data on the subject. There is the need for better data involving multicenter on the issue of AF associated with AMI. Multicenter data will optimize treatment modalities of AF and will evaluate the effects of antithrombotic and/or antiarrhythmic drugs.

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