

# FREQUENCY OF ATRIAL FIBRILLATION AND ITS COMMON CLINICAL OUTCOMES AMONG PATIENTS PRESENTING WITH ACUTE CORONARY SYNDROME

Muhammad Rehan Khan, Syed Azhar Sherazi, Sadiq Siyal

Department of Cardiology, District Head Quarter Hospital, Dera Ismail Khan - Pakistan

## ABSTRACT

**Objective:** To determine frequency of atrial fibrillation and its common clinical outcomes among patients presenting with acute coronary syndrome.

**Material and Methods:** This descriptive cross-sectional study was conducted in Cardiac Coronary Unit Department of Cardiology at District Headquarter Hospital, Dera Ismail Khan, KP, Pakistan from June 2014 to April 2015. Patients who were admitted with Acute Coronary Syndrome (USA, NSTEMI and STEMI) were included, while patients with severe comorbid condition like malignancies, renal failure, COPD, or decompensated liver cirrhosis diagnosed on history and clinical record were excluded. These patients were closely monitored and any episode of AF was noted. Those patients who developed AF were closely monitored for common clinical outcomes in the form of thromboembolic phenomenon, Ventricular Tachycardia, Ventricular Fibrillation, and death during hospital stay. 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 gender, AF, VT, VF, stroke, type of ACS, and death. AF and its common clinical outcomes were stratified among age, gender, and acute coronary syndrome to see the effect modifications.

**Results:** Out of 482 patients with acute coronary syndrome, males were 274 (57%) while females were 208 (43%). The mean age of the patients was 60.47 $\pm$ 9.79 years. 348 (72%) patients had STEMI, while 67 (14%) patients had NSTEMI and 67 (14%) had USA. Atrial fibrillation was found in 44 (9.1%) patients out of which, 22.7% had VF, followed by VT in 18.2% patients, while 18.2% patients died, and 13.6% patients sustained stroke.

**Conclusion:** Atrial Fibrillation complicating acute coronary syndrome is common in our population. Such patients should be identified and closely monitored as they have got higher rate of complications and mortality during hospital course.

**Key Words:** Atrial, Fibrillation, Coronary Syndrome, Stroke, Ventricular, Tachycardia, Mortality.

---

**This article may be cited as:** Khan MR, Sherazi SA, Siyal S. Frequency of atrial fibrillation and its common clinical outcomes among patients presenting with acute coronary syndrome. *J Med Sci* 2017; 25: (1) (Supplement) 119-122.

---

## INTRODUCTION

Atrial fibrillation (AF) is the most common cardiac arrhythmia in clinical practice, occurs frequently in myocardial infarction (MI) patients and is associated with an increased risk of stroke, heart failure (HF), and mortality.<sup>1</sup> Approximately 10% to 15% of persons with acute coronary syndrome have AF, which is associated

with an increase in mortality and risk of stroke, especially if left ventricular dysfunction is also present.<sup>2</sup> New atrial fibrillation in the peri-infarct period is associated with a higher infarct mortality.

AF and its associated morbidity represent a significant socio-economic burden on the healthcare system.<sup>3,4</sup> Direct cost estimates range from \$2000 to 14 200 per patient year in the USA and from € 450 to 3000 in Europe.<sup>5</sup> This is comparable with other chronic conditions, such as diabetes. In the USA, AF hospitalizations alone cost approximately \$6.65 billion in 2005<sup>6</sup>.

The presence of AF accounts for a 50% (men) to 90% (women) increased risk for overall mortality over 40 years follow-up in the Framingham Heart Study.<sup>6</sup> AF is also associated with significant morbidity, including a 2 to 7 fold increased risk for stroke (average 5% per

---

**Dr. Muhammad Rehan Khan** (Corresponding Author)  
Assistant Professor

Department of Cardiology, District Head Quarter Hospital, Dera Ismail Khan - Pakistan

Cell: +92-333-9987724

Email: fine\_dr44@yahoo.com

**Date Received:** September 9, 2016

**Date Revised:** December 15, 2016

**Date Accepted:** February 10, 2017

year), a 2 to 3 fold increased risk for dementia, and a tripling of risk for heart failure. In the Framingham Study, the percentage of strokes attributable to AF increases steeply from 1.5% at 50-59 years of age to 23.5% at 80-89 years of age. Approximately 20% of all strokes are due to AF, and paroxysmal AF carries the same stroke risk as permanent or persistent AF.<sup>7</sup> Data from the ARIC study indicate that incident AF is associated with an increased risk of sudden and non-sudden cardiac death in the general population. In a recent report on a large Swedish registry of 272,186 patients, AF was an independent risk factor of all cause mortality.<sup>8</sup>

In patients with AMI, AF is associated with higher 7 days mortality (5.1%) than those without AF (1.6%). Any type of AF like new onset, known persistent, or known paroxysmal AF associated with AMI almost doubles the mortality risk. Patients who develop AF during the acute phase of Myocardial infarction (MI) have a more complicated hospital course, and higher in-hospital mortality (13.8%) compared to those who do not have AF (5.8%)<sup>9</sup>. Sustained ventricular tachycardia (VT) and ventricular fibrillation (VF) are also common in these patients (14.8% and 14.7% respectively) compared to those who remain in sinus rhythm during the acute phase of MI (5.2% and 5.8% respectively). Transient AF during the acute phase of MI is also associated with increased risk of stroke (9.2%) compared to those without AF (2.6%).<sup>11</sup> Atrial fibrillation (AF) often complicates myocardial infarction (MI) and adversely impacts survival in MI patients, the impact of AF on health care utilization has not been studied.

Rationale to perform this study was that AF is not generally perceived by clinicians as a critical event during the acute coronary syndrome; and atrial fibrillation with acute coronary syndrome is associated with higher short term and long term complications. Moreover no local data is available on this issue and evidence base management of patients with coexisting MI and AF is limited.

### MATERIAL AND METHODS

This descriptive cross-sectional study was conducted at Coronary Care Unit (CCU), department of cardiology at District Headquarter Teaching Hospital, Dera Ismal Khan, Pakistan from June 2014 to April 2015. Patients presenting with suspected ACS were admitted to the Coronary Care Unit (CCU) for monitoring and management. The inclusion criteria was patients admitted to CCU with acute coronary syndrome, both male and female patients above 18 years of age. While the exclusion criteria was patients with severe comorbid condition like malignancies, renal failure, COPD, or decompensated liver cirrhosis diagnosed on history and clinical record. About 482 patients were included.

Detailed history, routine clinical examination and baseline investigations including ECG and echocardiography were done and cardiac enzymes were sent. ECG's of all these patients were analyzed for presence or absence of AF. During hospital stay patient's heart rhythm was monitored on cardiac monitor, and their ECG's were obtained daily during hospital stay to document any episode of AF.

Among patients in whom atrial fibrillation was detected were followed to detect ventricular arrhythmias, stroke and death. Those patients who develop stroke, CT brain was done and report was taken from radiologist of the hospital. All patients AF were reverted immediately by DC cardioversion.

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 gender, AF, stroke, acute coronary syndrome, and death. AF and its common clinical outcomes were stratified among age, gender, and acute coronary syndrome.

### RESULTS

A total of 482 patients with acute coronary syndrome were included. There were 274 (57%) male and 208(43%) female patients. Out of 482 patients, 348 (72%) were having STEMI, 67 (14%) patients were admitted with NSTEMI and 67 (14%) patients had Un-Stable Angina (USA). Atrial Fibrillation was found in 44(9.1%) patients. Among these 44 patients 30(68%) were male, and 14 (32%) were female. The age of the study population ranged from 34years to 94 years, with mean age of the patients was 60.47 $\pm$ 9.79 years.

Among 44 patients who developed AF, 32 patients had STEMI while 12 patients were admitted with NSTEMI. The most common clinical outcome in patients with AF were Ventricular Fibrillation, followed by Ventricular Tachycardia (VT), death and stroke. Among 10 patients who developed Ventricular Fibrillation, 2 patient was male and 8 were female, 5 of these 10 patients had STEMI, while 3 patients were admitted with NSTEMI and 2 patients had USA.

Ventricular Tachycardia was distributed in different age groups in such a way that among 8 patients who developed VT, 2 patients were in age group 51 to 60, 4 patients were in age group 61 to 70, while 2 patients were above 70 years. 6 patients were male and 2 were female, and all the 8 patients had STEMI. Out of 44 patients, 6 patients were suffered from stroke, 4 patients had STEMI, 2 had NSTEMI, all were above 70 years of age, 4(67.%) patient were male and 2 were female (33%). Among 8 patients who died, 4 patients had VF and 2 patient had stroke, and 2 patients had cardiogenic shock.

### DISCUSSION

Atrial Fibrillation is the most common clinical arrhythmia occurring in patients with ACS managed in CCU, leading to serious hemodynamic consequences and longterm complications. In our study the frequency of AF in patients with acute coronary syndrome was 9.1%, which is comparable with study done by Hunt D et al, in which frequency of AF was 11 per cent.<sup>12</sup> In one local study done in Karachi showed that among acute medical admissions to hospitals in Pakistan the frequency of AF was 6.5%, and about 47% of these patients had associated ischemic heart disease, which means that quite a high number of patients with ischemic heart disease have AF, however they not specifically targeted the patients with acute myocardial infarction or acute coronary syndrome.<sup>13</sup> A meta analysis of 20 different studies Schmit et al shows that 6 to 21% of patients developed AF during the acute phase of MI.<sup>14</sup>

Study done by Lopes et al, showed that AF was found in 7.5 patients with Acute MI (both ST elevation and non ST elevation MI) which are comparable with our results, however the subgroup analysis of this study showed that the frequency of AF was 8% in patients with STEMI and 6.4% in patients with NSTEMI, while in our study both groups were having an incidence of around 9%, 15 In our study the mortality was 18.2% in those patients who developed AF, while the study done by Lopes and his colleagues shows mortality of 5.1% in those who have AF compared to 1.6% for those who were in sinus rhythm during the acute phase of MI, in this study the incidence of VT was 18.2% while VF was found in 22.7% patients.<sup>15</sup>

In a study done by Pedersen et al, 16 6676 patients with acute MI were included, out of which, 1395 patients (21%) suffered from atrial fibrillation during hospitalization. Patients with atrial fibrillation were significantly older, a significantly greater proportion were women, left ventricular systolic dysfunction was more extensive, thrombolytic therapy was received less frequently, and anterior Q wave myocardial infarction was experienced more frequently. In hospital mortality rate was significantly higher in patients with atrial fibrillation during hospitalization (18%) than in patients without atrial fibrillation (9%). In our study 482 patients were included, the frequency of AF in patients with acute myocardial infarction was 9.1%, incidence of atrial fibrillation was high in patients above 60 years of age and AF was more commonly seen in female.<sup>16</sup>

Among MI patients with clinical signs of HF or left ventricular dysfunction enrolled in the OPTIMAAL trial, those with either AF at baseline or new-onset AF during follow-up exhibited an approximately 2-fold greater risk of subsequent stroke compared with those with no AF. In addition, the risk of future stroke or transient ischemic

attack during 1 year of follow-up was >3-fold greater in MI patients with transient AF occurring during the hospitalization for MI compared with those without AF in 2 different studies enrolling consecutive hospitalized patients.<sup>16,17</sup> In our study, out of 44 patients with AF,<sup>6</sup> patients were suffered from stroke,<sup>4</sup> patients had STEMI, 2 had NSTEMI, all were above 70 years of age, 4(67.%) patient were male and 2 (33%) were female.<sup>17</sup>

We studied only short term clinical outcome and did not compare with patients in sinus rhythm, so further studies will be needed to determine the true effect of AF in patients with MI and to determine its long term consequences.

### CONCLUSION

Atrial fibrillation is often observed in the setting of ACS and carries excess risk of complications like stroke, Ventricular Tachycardia, and Ventricular Fibrillation. Mortality rate is high in this group of patients. AF should be considered a significant clinical event during acute myocardial infarction and these patients need to be identified and closely monitored.

### RECOMMENDATIONS

Special attention should be given to pharmacological rate control, antiarrhythmic drugs and prevention of thromboembolism in these patients.

### REFERENCES

1. Piccini JP, Hammill BG, Sinner MF, Jensen PN, Hernandez AF, Heckbert SR et al. Incidence and prevalence of atrial fibrillation and associated mortality among Medicare beneficiaries, 1993-2007. *Circ Cardiovasc Qual Outcomes*. 2012;5:85-93.
2. Andersson T, Magnuson A, Bryngelsson IL, Fröbert O, Henriksson KM, Edvardsson N et al. All-cause mortality in 272, 186 patients hospitalized with incident atrial fibrillation 1995-2008: a Swedish nationwide long-term case-control study. *Eur Heart J*. 2013; 34: 1061-67.
3. Schmitt J, Duray G, Gersh BJ, et al. Atrial fibrillation in acute myocardial infarction: a systematic review of the incidence, clinical features and prognostic implications. *Eur Heart J* 2009;30:1038-45.
4. Wolowacz SE, Samuel M, Brennan VK, Jaso-Mosqueda JG, Van Gelder IC. The cost of illness of atrial fibrillation: a systematic review of the recent literature. *Europace*. 2011; 13:1375-85.
5. Kim MH, Johnston SS, Chu BC, Dalal MR, Schulman KL. Estimation of total incremental health care costs in patients with atrial fibrillation in the United States. *Circ Cardiovasc Qual Outcomes*. 2011;4:313-20.
6. Benjamin EJ, Wolf PA, D'Agostino RB, Silbershatz H, Kannel WB, Levy D. Impact of atrial fibrillation on the risk of death: the Framingham Heart Study. *Circulation*. 1998; 98: 946-52.

## Frequency of atrial fibrillation and its common clinical outcomes among.....

7. Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation as an independent risk factor for stroke: The Framingham Study. *Stroke*.1991; 22: 983-88.
8. Friberg L, Hammar N, Rosenqvist M. Stroke in paroxysmal atrial fibrillation: report from the Stockholm Cohort of Atrial Fibrillation. *EurHeart J*. 2010; 31: 967-75.
9. Milika AR, Zorana VM, Mihailo MD, et al. The long-term risk of stroke in patients with acute myocardial infarction complicated with new-onset atrial fibrillation. *ClinCardiol* 2009;32:467-70.
10. Chen LY, Sotoodehnia N, Buzkova P, Lopez FL, Yee LM, Heckbert SR, et al. Atrial fibrillation and the risk of sudden cardiac death: the atherosclerosis risk in communities study and cardiovascular health study. *JAMA Intern Med*. 2013; 173: 29-35.
11. Hart RG, Pearce LA, Rothbart RM, McAnulty JH, Asinger RW, Halperin JL. Stroke with intermittent atrial fibrillation: incidence and predictors during aspirin therapy. *Stroke Prevention in Atrial Fibrillation Investigators*. *J Am Coll Cardiol*. 2000; 35: 183-87.
12. Hunt D, Sloman G, Christie D, Penington C. Changing patterns and mortality of acute myocardial infarction in a coronary care unit. *Br Med J*. 1977;1:795-98.
13. Haq U, Lip GYH. A prospective survey of acute hospital admissions with atrial fibrillation in Karachi, Pakistan. *JR Coll Physicians Edinb* 2009;39:200-03.
14. Schmitt J, Duray G, Gersh BJ, Hohnloser SH. Atrial fibrillation in acute myocardial infarction: a systematic review of the incidence, clinical features and prognostic implications. *Eur Heart J*. 2009; 30: 1038-45.
15. Lopes RD, Pieper KS, Horton JR, Al-Khatib SM, Newby LK, Mehta RH et al. Short- and long-term outcomes following atrial fibrillation in patients with acute coronary syndromes with or without ST-segment elevation. *Heart*. 2008 ;94:867-73.
16. Pedersen OD, Abildstrom SZ, Ottesen MM, et al. Increased risk of sudden and non-sudden cardiovascular death in patients with atrial fibrillation/flutter following acute myocardial infarction. *Eur Heart J* 2006;27:290-95.
17. Lehto M, Snapinn S, Dickstein K, et al. Prognostic risk of atrial fibrillation in acute myocardial infarction complicated by left ventricular dysfunction: the OP-TIMAAL experience. *Eur Heart J* 2005; 26:350-56.

**CONFLICT OF INTEREST:** Authors declare no conflict of interest

**GRANT SUPPORT AND FINANCIAL DISCLOSURE** NIL

### **AUTHOR'S CONTRIBUTION**

Following authors have made substantial contributions to the manuscript as under:

**Khan MR:** Conception and design collected data and all material

**Sherazi SA:** Statistical analysis done Ethical committee approval

**Siyal S:** Manuscript writing.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

The Journal of Medical Sciences, Peshawar is indexed with WHO IMEMR (World Health Organisation Index Medicus for Eastern Mediterranean Region) and can be accessed at the following URL.

<http://www.who.int/EMRJorList/details.aspx?docn=4468>