

Frequency of Arrhythmias in Patients with Acute Myocardial Infarction

Abdul Ghaffar Memon¹, Rajkumar Sachdewani² and Shahid Memon¹

ABSTRACT

Objective: To determine the frequency of arrhythmias in patients admitted with Acute Myocardial Infarction.

Study Design: Observational study

Place and Duration of Study: This study was conducted at the Department of Cardiology, LUH Hyderabad from January 2015 to December 2016.

Materials and Methods: Patients with Acute MI, both genders were selected for the study. Acute MI and arrhythmia's diagnosis was assessed on the basis of history, electrocardiography and arrhythmias, and significantly cardiac enzymes (biomarkers) elevation particularly Troponins. Finally arrhythmias were assessed and all the data was recorded in the proforma.

Results: In our study 90 patients were selected, patients mean age was 55.66±10.4 years male gender was most common 69(76.6%). Acute anterior wall MI and Acute inferior MI were found most common as 27.77% and 23.33%. Over all arrhythmias was found 83.40%. According to type of arrhythmias VT, VF, Atrial Fibrillation and CHB were found most common as 26.66%, 13.34%, 14.66% and 14.66% respectively.

Conclusion: We concluded that Arrhythmias is most frequent in patients with MI, and found almost all in cases

Key Words: AMI, frequency, Arrhythmias

Citation of article: Memon AG, Sachdewani R, Memon S. Frequency of Arrhythmias in Patients with Acute Myocardial Infarction. Med Forum 2017;28(4):181-184.

INTRODUCTION

Acute myocardial infarction (MI) is also called heart attack refer to decrease blood and oxygen supply to cardiac muscles which leads to necrosis or cell death. This occurs due to blockage of coronary artery lumen by thrombus. ¹ There is two commonest sub types of acute MI, non-ST-elevated MI and ST-elevated MI². Most important reason of total blockage of coronary artery is disruption of an atherosclerotic plaque which initiates clotting cascade.^{3,4} Atherosclerosis results from steady accumulation of fibrous tissue and cholesterol in the walls of arteries over a long period of time. ⁵On angiography, irregularities in the blood stream column are seen which suggests narrowing of artery lumen due to accumulation of atherosclerosis for a long time. ⁶ Plaques can be unstable, rupture or they may form thrombus which blocks the artery within minutes. When plaque ruptures inside the coronary artery than it results in myocardial infarction ^{3,4}

In minority of cases with acute ischemia, polymorphic ventricular tachycardia (VT) or ventricular fibrillation (VF) is observed early in course of arrhythmogenesis which is mostly associated with genetic predisposition.⁷

Frequency of mortality in patients who are admitted to hospital due to acute cardiac failure or VT/VF has been decreased remarkably because of extensive use of reperfusion methods. Most important complication of acute myocardial infarction is arrhythmias, which is responsible for 40-50% of mortality. After AMI, likelihood risk of arrhythmias after first hour is about fifteen times more than 12 hours ^{8,9}. In myocardial infarction, incidence of ventricular arrhythmia and bundle branch block is high. In the studies, 13% of cases during hospitalization had BBB. Degree of frequency of VT is 39%. 22.6% PVC, 12% ventricular tachycardia and the ventricular fibrillation 4.4% respectively.¹⁰ Few studies have showed various types of arrhythmias with numerous distributions of MI.^{11,12} Goal behind this study was to determine the frequency of arrhythmias in patients admitted in cardiology department with acute MI.

MATERIALS AND METHODS

Present observational study was done in cardiology department of LUH Hyderabad with one year duration from January 2015 to December 2016. Patients with Acute MI, both genders were selected for the study. All the patients with history of malnutrition, alcoholism, diarrhea and history of drugs like as Loop and thiazide diuretic and PPI were not selected in the study. From all the selected cases written and informed consent was taken. All patients were under went clinical examination and complete medical history. Diagnosis of the acute MI and arrhythmias was assessed on the basis of history, electrocardiography and arrhythmias,

¹. Department of Cardiology, LUMHS, Hyderabad.

². Department of Cardiology, GMMC Sukkar

Correspondence: Dr. Abdul Ghaffar Memon, Assistant Professor, Department of Cardiology, LUMHS, Hyderabad.
Contact No: 03132851728
Email: dr.sajidarain@gmail.com

and significantly cardiac enzymes (biomarkers) elevation particularly Troponins. All routine laboratory investigations were carried out from diagnostic laboratory of the LUH, Hyderabad. Finally arrhythmias were assessed and all the data was recorded in the proforma. SPSS version 20 was used for the data analysis.

RESULTS

In this study 90 patients were selected, patients mean age was 55.66±10.4 years male gender was most common 69(76.6%), while female were 21(23.4%). Table 1.

Table No.1: Patients distribution according to age and gender n=90

	Frequency (%)
AGE (mean±SD)	55.66±10.4 years
GENDER	
Female	21(23.4%)
Male	69(76.6%)

Table No.2: Types of myocardial Infarction n=90

Type of MI	Frequency	Percent
Acute anterior wall MI	25	27.77%
EXT ANT WALL MI	12	13.34%
Acute A/S MI	03	03.34%
Acute AVR MI	02	02.22%
Acute inferior MI	21	23.33%
Acute inferior +RV MI	15	16.66%
Acute inferior +POST MI	07	07.77%
Acute inferior +LATERAL MI	03	03.34%
Acute POST WALL MI	02	02.22%

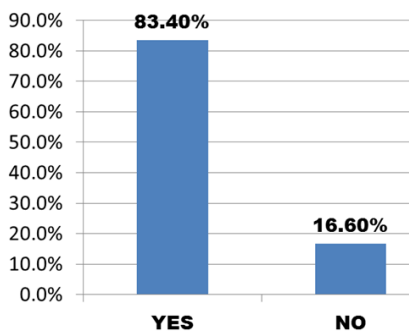


Figure No.1: Frequency of arrhythmias (n=90)

In this study acute anterior wall MI and Acute inferior MI were found most common as 27.77% and 23.33%, following by EXT ANT WALL MI, Acute AVR MI, Acute A/S MI, Acute inferior +RV MI, Acute inferior +POST MI, Acute inferior +LATERAL MI and Acute POST WALL MI with percentage of 13.34%, 03.34%, 02.22%, 16.66%, 07.77%, 02.22% and 03.34% respectively. Table 2.

In this study arrhythmias was found 83.40%. Figure 1. in this study according to type of arrhythmias VT, VF, Atrial Fibrillation and CHB were found most common as 26.66%, 13.34%, 14.66% and 14.66% respectively, while 1ST Degree AV Block, 2nd Degree AV Block, 2ND Degree Heart Blocks, Atrial Fibrillation, Bigemny, High Degree AV block, Junctional Bradycardia, Sinus Bradycardia, SVT and Variable Block were found with percentage of 1.34%, 2.67%, 1.34%, 2.67%, 1.34%, 4.0%, 8.0%, 4.0% and 2.67% respectively.

Table No.3: Types of arrhythmias in patients with acute MI n=75

Arrhythmias	Frequency	Percent
First degree AV BLOCK	01	1.34%
Second degree AV BLOCK	02	2.67%
Second degree heart blocks	01	1.34%
Atrial Fibrillation	11	14.66%
BIGEMNY	02	2.67%
CHB	11	14.66%
HIGH DEGREE AV BLOCK	01	1.34%
JUNCTIONAL BRADYCARDIA	03	4.0%
SINUS BRADYCARDIA	06	8.0%
SVT	02	2.67%
VARIABLE BLOCK	03	4.0%
VF	10	13.34%
VT	20	26.66%

DISCUSSION

This study was conducted to evaluate frequency of arrhythmias in patients having acute MI. In this study 90 patients were selected, patients mean age was 55.66±10.4 years male gender was most common 69(76.6%), while female were 21(23.4%). In the study of D, rajasekhar¹³ reported mean age as 54.5 ± 11.5 years, also reported that male gender was in majority 71%. Masood A et al,¹⁴ had also showed male gender most common 75% and female gender 25%. Hreybe H et al¹⁵ reported that study participants were with mean age as 64.66±14.07 years and male gender most common 63.4%.

In this study acute anterior wall MI and Acute inferior MI were found most common as 27.77% and 23.33%, following by EXT ANT WALL MI, Acute AVR MI, Acute A/S MI, Acute inferior +RV MI, Acute inferior +POST MI, Acute inferior +LATERAL MI and Acute POST WALL MI with percentage of 13.34%, 03.34%, 02.22%, 16.66%, 07.77%, 02.22% and 03.34% respectively. Masood A et al, ¹⁴ reported that 63.8% cases had anterior wall MI, 31.3% were with inferior wall MI, 3.8% were with posterior wall MI and only 1.3% were with lateral wall MI. Palwasha Sahibzada et

al.¹⁶ stated that out of total cases 45.1% were with STEMI, 29% having anterior wall MI and 16% were with inferior wall MI, while 29% were diagnosed as ACS. Similar finding also reported by some other studies.^{17,18} Hreybe H et al¹⁵ reported that AMI was found as 41.2% had anterior MI, 52.9% had inferior MI, 1.6% having posterior MI, and 4.2% had lateral MI.

In this study over all arrhythmias was found 83.40%. Similarly Toshniwal SP et al¹⁹ reported that out of 118 cases, 79.88% had different types of arrhythmias. Almost 90% cases had arrhythmias during early 24 hours, furthermore half of these 48.93% were observed during 1st hour with statistically significance. Most common sinus bradycardia was in 21.30% cases. Ventricular premature complexes were the 2nd most common in the 11.70% cases. Rajkumar C et al²⁰ also reported that 75% had develop arrhythmias with MI in peri-infarct period.

In this study according to type of arrhythmias VT, VF, Atrial Fibrillation and CHB were found most common as 26.66%, 13.34%, 14.66% and 14.66% respectively, while 1ST Degree AV Block, 2ND Degree AV Block, 2ND Degree Heart Blocks, Atrial Fibrillation, Bigemny, High Degree AV block. Junctional bradycardia, Sinus Bradycardia, SVT and Variable Block were found with percentage of 1.34%, 2.67%, 1.34%, 2.67%, 1.34%, 4.0%, 8.0%, 4.0% and 2.67% respectively. These results are comparable with the previous studies in which they reported association of the AMI location and the different arrhythmias.^{21,22} Many other studies reported link between inferior AMI and the different degrees of the AV blockade. Rathore et al.²² stated that occurrence of complete AV block in cases having inferior MI was highly more in the comparison of anterior AMI. Rajkumar C et al²⁰ also reported sinus bradycardia (24%) and sinus tachycardia (28.5%) were the most frequently seen arrhythmia.

CONCLUSION

We concluded that Arrhythmias is most frequent in patients with MI, and found almost all in cases. More research is needed to assess more information regarding arrhythmias in patients with MI.

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

- Suri A, Tincey S, Ahsan S, Meier P. Thrombolysis in myocardial infarction. In *Novel Strategies in Ischemic Heart Disease* 2012. 124-34
- Moe KT, Wong P. Current trends in diagnostic biomarkers of acute coronary syndrome. *Ann Acad Med Singapore* 2010;39(3):210-5.
- Tsujita K, Kaikita K, Soejima H, Sugiyama S, Ogawa H. Acute coronary syndrome-initiating factors. *Nihon rinsho. Japanese J Clin Med* 2010; 68(4):607-14.
- Dohi T, Daida H. Change of concept and pathophysiology in acute coronary syndrome. *Nihon rinsho. Japanese J Clinical Med* 2010; 68(4):592-6.
- Woollard KJ, Geissmann F. Monocytes in atherosclerosis: subsets and functions. *Nature Reviews Cardiol* 2010;7(2):77-86.
- Spaan J, Kolyva C, van den Wijngaard J, Ter Wee R, van Horssen P, Piek J, et al. Coronary structure and perfusion in health and disease. *Philosophical Transactions of the Royal Society of London A: Mathematical, Physical and Engineering Sciences* 2008;366(1878):3137-53.
- Bezzina CR, Pazoki R, Bardai A, Marsman RF, de Jong JS, Blom MT et al. Genome- wide association study identifies a susceptibility locus at 21q21 for ventricular fibrillation in acute myocardial infarction. *Nat Genet* 2010;42:688-91.
- Tofighiyan T. Prevalence of Cardiac Arrhythmia Disorders in Patients with Myocardial Infarction Admitted to CCU Ward in the Vasei Hospital of Sabzevar. *Quarterly J Ahvaz Faculty of Nursing and Midwifery* 2012;1(2).
- Bagheri M. Compared the prevalence of arrhythmias in myocardial infarction receiving streptokinase with or without upon 400 patients in Zahedan khatamolambia hospital (dissertation). Zahedan: Zahedan University of Medical Sciences; 1998
- Nogh H, Esmaeili Nadimi A, Khodadadzadeh A, Rafiee G. Bundle branch block and ventricular tachyarrhythmias in hospital patients with acute myocardial infarction in rafsanjan 2000- 2001. *J Rafsanjan Univ Med Sci* 2001; 3(4): 1-8
- Henriques JP, Gheeraert PJ, Ottervanger JP, de Boer MJ, Dambrink JH, Gosselink AM. Ventricular fibrillation in acute myocardial infarction before and during primary PCI. *Int J Cardiol* 2005;105(3):262-6.
- Gomez JF, Zareba W, Moss AJ, McNitt S, Hall WJ. Prognostic value of location and type of myocardial infarction in the setting of advanced left ventricular dysfunction. *Am J Cardiol* 2007; 99(5):642-6.
- Rajasekhar1 D, Vanajakshamma V, Babu1 S, Venkateswara1 R, Thakkar AS. Single Centre Experience and Outcome of Primary Percutaneous Coronary Intervention for Patients with ST-Segment-Elevation Myocardial Infarction. *J Cardiol Therapeutics* 2013;1:51-57
- Masood A, Naqvi MA, Jafar SS, Mufti AA, Akram Z. In-hospital outcome of acute myocardial infarction in correlation with 'thrombolysis in myocardial infarction' risk score. *J Ayub Med Coll Abbottabad* 2009; 21(4): 24-27.

15. Hreybe H, Saba S. Location of acute myocardial infarction and associated arrhythmias and outcome. *Clinical cardiol* 2009;32(5):274-7.
16. Sahibzada P, Khan AA, Sahibzada WA. The Impact Of Hyperglycaemia On Morbidity And Mortality Of Acute Coronary Syndromes And Acute Myocardial Infarction. *J Ayub Med Coll Abbottabad* 2009;21(1);110-15.
17. Bruno Henrique Gallindo de Mello, Gustavo Bernardes F. Oliveira, Rui Fernando Ramos, Bernardo Baptista C. Lopes, Validation of the Killip–Kimball Classification and Late Mortality after Acute Myocardial Infarction. *Arq Bras Cardiol.* 2014; [online].ahead print, PP.0-0.
18. Khan S, Matiullah, Adnan Y, Noor L, Zahid rg, Awan A. Frequency of heart failure and its clinical outcome among patients presenting with acute myocardial infarction. *Pak J Physiol* 2012;8(2); 37-39.
19. Toshniwal SP, More RA, Kabara MV. Arrhythmias During the 1st Week of Acute Myocardial Infarction: An Observational Cross-Sectional Study.
20. Rajkumar C, Kumar EK, Subhash A, Singh NK, Nagabushana MV, Reddy YV. A study of arrhythmias in the first week of acute myocardial infarction-an experience of a rural medical college hospital. *Lateral* 12:24.
21. Simons GR, Sgarbossa E, Wagner G, et al. Atrioventricular and intraventricular conduction disorders in acute myocardial infarction: A reappraisal in the thrombolytic era. *Pacing Clin Electrophysiol* 1998;21(12):2651–2663.
22. Rathore SS, Gersh BJ, Berger PB, et al. Acute myocardial infarction complicated by heart block in the elderly: Prevalence and outcomes. *Am Heart J* 2001;141(1):47–54.