

Study of cardiac arrhythmias in acute myocardial infarction patients within 48 hours after admission in a tertiary care hospital

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Abstract

Background: Acute myocardial infarction (AMI) is a major cause of death worldwide with arrhythmia being the most common determinant in the post-infarction period. **Objectives:** To evaluate the incidence and profile of cardiac arrhythmias in acute myocardial infarction in the first 48 hours of hospitalization. **Material and Methods:** 100 consecutive acute myocardial infarction patients presenting to intensive care unit of medicine department. **Results:** Most common (31%) age group was 41-50. 80% subjects reported with arrhythmias in 48 hours post myocardial ischemic attack. Sinus arrhythmias being most common 31.25% and ventricular tachycardia with most fatal among all arrhythmias. **Conclusions:** Arrhythmias are common causes of mortality immediate post ischemic period, so prompt intervention can prevent both arrhythmias and deaths in acute ischemic attack patients.

Key Words: Acute myocardial infarction, arrhythmias, ventricular tachycardias

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INTRODUCTION

Coronary artery disease is the leading cause of death in the industrialized world. Indians also have a higher incidence, morbidity and mortality.¹ The acute phase of myocardial infarction may be complicated by sudden arrhythmic death, often preceded by "warning" ventricular arrhythmias.² Cardiac biomarkers (CK-MB/troponin-I) above the 99th centile of the upper reference limit 4 hours after starting of symptom refers to cardiac necrosis.³ Complication includes arrhythmic, mechanical, inflammatory sequel, about 90% develops some form of cardiac arrhythmia. In 25% patients, such

rhythm abnormalities manifest within first 24 hours and risk of ventricular fibrillation is maximum in the 1st hour and declines thereafter.⁴ Almost any rhythm disturbance can be associated with acute myocardial infarction, including bradyarrhythmias, supraventricular tachyarrhythmias, ventricular arrhythmias, and atrioventricular block. With the advent of thrombolytic therapy, it was found that some rhythm disturbances in patients with acute myocardial infarction may be related to coronary artery reperfusion (reperfusion arrhythmias).⁵ There is not much documented evidence regarding the profile of such arrhythmias in the present population of study area. Hence the purpose of this study is to evaluate the incidence and profile of cardiac arrhythmias in AMI in the first 48 hours of hospitalization in a tertiary care hospital.

MATERIAL AND METHODS

The data was obtained from total of 100 patients admitted to the ICU, Department of Internal Medicine, Sapthagiri Institute of Medical Sciences and Research Center, Bengaluru, The study was approved by Institutional Ethical Committee. Written informed consent was taken

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before study. Patient details and appropriate investigations were done.

Inclusion Criteria were: 1. Patients 18 years of age or above admitted in the ICCU with acute myocardial Infarction 2. ST segment elevation Myocardial infarction 3. Myocardial infarction less than 48 hours old.

Exclusion Criteria were 1. Patients less than 18 years of age 2. Myocardial infarction 48 hours old or more 3. Non ST segment elevation myocardial infarction.

Statistical Methods: The data obtained was analyzed as means of percentage, proportions with the help Microsoft excel.

RESULTS

Table 1: Distribution as per age of study subjects

Age group (in years)	Total	Percentage
20-30	4	4
31-40	19	19
41-50	31	31
51-60	29	29
61-70	10	10
>71	7	7
Total	100	100

41-50 was most common age group 31%, while 51-60 age group was second most common group with 29% of study subjects.

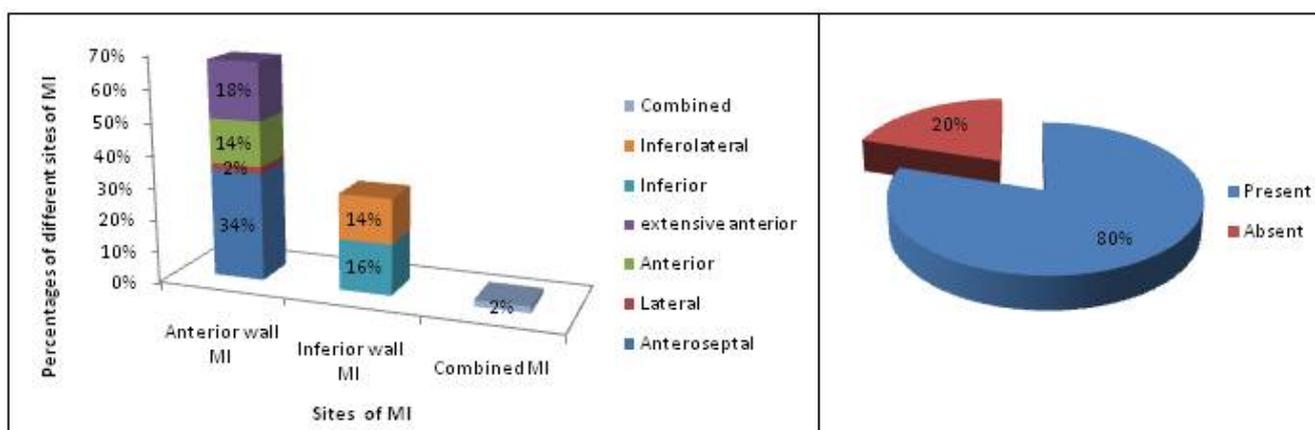


Figure 1: Bar diagram showing site of infarction

Figure 2: Pie diagram showing incidence of arrhythmias in study subjects

Anterior wall MI was most common site for MI (68%), while combined anterior and inferior wall MI was seen in only 2% of study subjects.

Table 2: Distribution as per time of appearance of individual arrhythmias

Types of arrhythmias	≤ 12 hours	12-24 hours	24-48 hours	Total (%)
Sinus tachycardia	7	12	6	25 (31.25)
Premature ventricular beats	11	3	3	17 (21.25)
Sinus bradycardia	9	1	1	11 (13.75)
Premature atrial beats	3	1	2	6 (7.50)
Bundle branch blocks	0	1	5	6 (7.50)
VT	2	1	1	4 (5.0)
AVB	1	4	0	4 (5.0)
SVT	2	1	0	3 (3.75)
VF	1	1	0	2 (2.5)
AF	0	1	1	1 (1.25)
Total	36 (45)	26 (32.5)	18 (22.5)	80 (100)

Sinus tachycardia was the most common arrhythmia 31.25% in 1st 48 hours in study subjects, while highest mortality was seen in ventricular tachycardia and ventricular fibrillation 66% and 100% respectively.

DISCUSSION

This study was conducted in intensive care unit of medicine department at Department of Internal Medicine, Sathagiri Institute of Medical Sciences and Research Center, Bengaluru, Consecutive 100 patients with Acute Myocardial Infarction were selected. The age distribution in this present study ranged from 24 years to 83 years

with maximum (31%) number of patients in the age group 41 to 50 years. Similar results were seen in Muthuraju NM *et al*⁵, Singh PS *et al*⁶, Shah MJ *et al*⁷ and Rajgopalan *et al*⁸ studies. In our study we found that total of 23% of the patients were aged 40 years or below. This was comparable with study done by Siwachet *al*⁹. who reported incidence of 19.2% for this age group. In our

study 68% patients had anterior wall MI and 20% had inferior wall MI, similar results were seen in study done by Nagabhushana S *et al*¹⁰ with 66% and 30% incidence respectively. In our study anterior wall MI had 85% incidence of arrhythmias similar was concluded by Nagabhushana S *et al*¹⁰ 92.4% and also with Rathod S *et al*¹¹, Murthy *et al*¹² it was 84.6 and 88.5 respectively. In the present study out of total 100 patients more than half 80% of patients reported arrhythmia of some sort, this finding was is comparable to Toshniwal SP *et al*¹³ study with 80% subjects in their study showing arrhythmias, Nagabhushana S *et al*¹⁰ reported 89% arrhythmias in their study, also Rathod S *et al*¹¹ reported similar finding. In the present study 62% of patients developed some sort of arrhythmias within 24 hours of admission, while 18% developed arrhythmia after 24 hours of admission. Totally 80% patients manifested with arrhythmia within 48 hours of admission, which was in accordance with Nagabhushana S *et al*¹⁰ 67% reported arrhythmias in first 24 hours, Murthy RS *et al*¹² reported incidence of 72.5% of arrhythmia within 24 hours of admission which was little higher than our finding. Marangmei L *et al*¹⁴ reported 76% arrhythmias in 48 hours, which was a slightly higher than our finding. Sinus tachycardia 32.25% was the commonest arrhythmia seen in our study, which was comparable with study by Julian *et al*.¹⁵ Sinus tachycardia 31.25% was more frequent in anterior wall MI (27%) when compared to inferior wall MI (3 %). This is in conformity with study by Julian *et al*.¹⁵ and Jewitt *et al*.¹⁶ who have reported a higher incidence of 48.5% and 53.4% respectively in anterior wall MI. In a study by Marangmei L *et al*¹⁴ 7% patients developed ventricular tachycardia, of which 85% patients died during first 48 hours of hospitalization. While in our study we have found 5% patients out of 80 had ventricular arrhythmias. Mortality was higher in patients with ventricular tachycardia this finding was in accordance with Marangmei L *et al*¹⁴ and Goldberg *et al*¹⁷ studies.

CONCLUSION

The commonest arrhythmias in our study were sinus tachycardia. 62% of patients developed arrhythmias in one or the other form within 24 hours of admission, with ventricular tachycardia with most mortality. Higher mortality was seen in those with later hospital presentation. So efforts should be directed towards early intervention in cases with AMI to prevent deaths.

REFERENCES

1. Enas EA, Dhawan J, Petkar S. Coronary artery disease in Asian Indians: Lessons learnt and the role of lipoprotein(a). *Indian Heart J* 1997; 49:25-34.

2. Lie KI, Liem KL, Schuilenburg RM, David GK, Durrer D. Early identification of patients developing late in-hospital ventricular fibrillation after discharge from the coronary care unit. *Am J Cardiol* 1978; 41: 674-7.
3. Thygesen K, Alpert JS, White HD; Joint ESC/ACCF/AHA/WHF Task Force for the Redefinition of Myocardial Infarction. Universal definition of myocardial infarction. *Eur Heart J* 2007; 28:2525-38.
4. Kondur AK, Hari P, Pitta SR, Afonso LC, Daram SR. Complications of myocardial infarction. Available from: <http://www.directory.medscape.com> [Last accessed on 2010 Aug 17].
5. Muthuraju NM, Chandrashekar HM. The pattern of arrhythmias during first 48 hours of acute myocardial infarction. *International Journal of Medicine Research*, Volume 1; Issue 4; September 2016; Page No. 38-40
6. Singh PS *et al*. Clinical profile and risk factors in acute coronary syndrome. *Journal, Indian Academy of Clinical Medicine*. 2013 April-June; 14(2):130-2.
7. Shah MJ *et al*. A Study of 100 Cases of Arrhythmias in First Week of Acute Myocardial Infarction in Gujarat, A High Risk and Previously Undocumented Population. *J Clin Diagn Res*. 2014 Jan; 8(1): 58-61.
8. Rajgopalan *et al*. Acute cardiac infarction treated in an intensive coronary care unit. *Indian Heart J*. 1972; 24(2):92-100.
9. Siwach SB, *et al*. Profile of young acute myocardial infarction in Haryana. *J Assoc Physicians India*. 1998; 46(5):424-6.
10. Nagabhushana S, Ranjithkumar GK, Ranganatha M, Virupakshappa. Study of Arrhythmias in Acute Myocardial Infarction. *Int J Med Res Rev* 2015; 3(7):682-690. doi: 10.17511/ijmrr.2015.7.126.
11. Sangita Rathod *et al*. Study of various cardiac arrhythmias in patients of acute myocardial infarction: *Int Arch Inte Med*. 2014 December; 1(4): 32-41.
12. Murthy R.S.N. *et al*. Arrhythmias in acute myocardial infarction, incidence and clinical significance. *Indian Heart J*. 1984 Sep-Oct; 36(5):335.
13. Toshniwal SP, More RA, Kabara MV. Arrhythmias during the 1st Week of Acute Myocardial Infarction: An Observational Cross Sectional Study. *Int J Adv Health Sci* 2015; 1(9):1-4.
14. Marangmei L, Singh SK, Devi KB, Raut SS, Chongtham DS, Singh KB. Profile of cardiac arrhythmia in acute myocardial infarction patients within 48 hours of admission: A hospital based study at RIMS Imphal. *J Med Soc* 2014; 28:175-9.
15. Julian DG, Valentine PA, Miller GC. Disturbances of Rate, Rhythm and conduction in acute myocardial infarction. *Am. J Me.* 1964; 37(6):915-27.
16. Jewitt DE, *et al*. Incidence and management of Supraventricular arrhythmias after acute myocardial infarction. *Lancet*. 1967; 290(7519):734-8.
17. Goldberg RJ, Yarzebski J, Spencer FA, Zavallos JC, Lessard D, Gore JM. Thirty year trends (1975-2005) in the magnitude, patient characteristics, and hospital outcomes of patients with acute myocardial infarction complicated by ventricular fibrillation. *Am J Cardiol* 2008; 102:1595-601.

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