

Association of Arrhythmias with Acute Myocardial Infarction in the Peri-Infarction Period:

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Abstract:

Background: Arrhythmias have been associated with Myocardial Infarction (MI) for a long time. There have been many studies conducted on monitoring or recording of arrhythmias in the post MI period ranging from weeks to years. But in our region (Coimbatore) there is not many studies available regarding the association of arrhythmias with acute MI observed within 48 hours of the acute episode. Hence the present study was conducted with an aim of studying the association of arrhythmias in the PERI-infarction period.

Materials And Methods: 100 patients who were admitted to the Intensive Cardiac Care Unit (ICCU) after being diagnosed with Acute Myocardial Infarction (AMI) were studied. The requirement lasted for about a year.

Inclusion criteria : Patients greater than or equal to 18 years of age admitted to ICCU with AMI with an occurrence of acute episode within 48 hours.

Exclusion criteria: Patients less than 18 years of age, Myocardial Infarction greater than 48 hours- Patients ECGs were continuously monitored. Risk factors for heart disease were investigated.

Results: A larger group was seen associated with Anterior Wall MI. Sinus arrhythmias were predominantly associated with antero-lateral and inferior wall MI. Overall incidence of ventricular arrhythmias was 33%. Bundle branch blocks were more accounted for with anterior wall MI. Reperfusion arrhythmias were observed in 33% of subjects.

Conclusion: Acute Myocardial Infarction is mostly seen in anterior wall with a high incidence of tachyarrhythmias and higher mortality whereas on the other hand inferior wall MI is less common and associated with bradyarrhythmias and lesser mortality. Early streptokinase therapy has a good impact on mortality in MI and hence should be tried in all Acute MI patients who do not have contraindications for the streptokinase therapy.

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I. Introduction

BACKGROUND: Arrhythmias have been frequently associated with Myocardial Infarction (MI) since long. There are many studies about monitoring or recording of arrhythmias in the post MI period ranging from weeks to years. But there is a scarcity of studies in our region (Coimbatore) regarding the association of arrhythmias with acute myocardial infarction observed within 48 hours of the acute episode.

The study was conducted to know the incidences of various types of arrhythmias associated with Acute Myocardial Infarction in relation to the peri-infarction period(i.e., within 48 hours of the episode) and their outcome.

METHODS: 100 consecutive patients were studied who were admitted to the Intensive Cardiac Care Unit (ICCU) after being diagnosed with Acute Myocardial Infarction (AMI). Recruitment lasted for one year.

Inclusion criteria: Patients greater than or equal to 18 years of age admitted to ICCU with AMI with an occurrence of acute episode within 48 hours.

Exclusion criteria: Patients less than 18 years of age, Myocardial infarction less than 48 hours- Patients ECGs were continuously monitored. Risk factor for heart disease was investigated.

II. Results

Incidence of arrhythmias: Most of the patients presented with more than one type of arrhythmia. Ventricular arrhythmias were present in 32%, out of which 21% had Ventricular Tachycardia (VT) and 28% had Ventricular Premature Beats (VPB). 23% of them had Sinus tachycardia and 12% had Sinus bradycardia , of the sample population.

Bundle branch block, AV block and complete heart block were present in 22%, 19% and 13% of the patients respectively. Supra Ventricular Tachycardia (3%), Atrial Fibrillation (2%), Atrial Ectopic (1%) are the other types of arrhythmias recorded.

Depending on the site of the infarct sinus tachycardia was associated with antero-lateral MI(35.3%) and was least associated with infero-lateral MI(12.5%). 13% of the subjects were seen with complete heart block of which 31% each had inferior and anterior MIs. 19% of the patients were seen with AV block out of which majority(58%) had inferior wall MIs.

Reperfusion arrhythmias : Ventricular premature beats were the most common type followed by accelerated idio-ventricular rhythms. Most of the arrhythmias were transient and were self-terminated except for VT which had to be terminated with cardio-version.

EFFECTS OF STREPTOKINASE: Of the total study population, 64% received streptokinase. Mortality (28% of total study population) was higher in the non-streptokinase group (20%) than in the streptokinase group (8%).

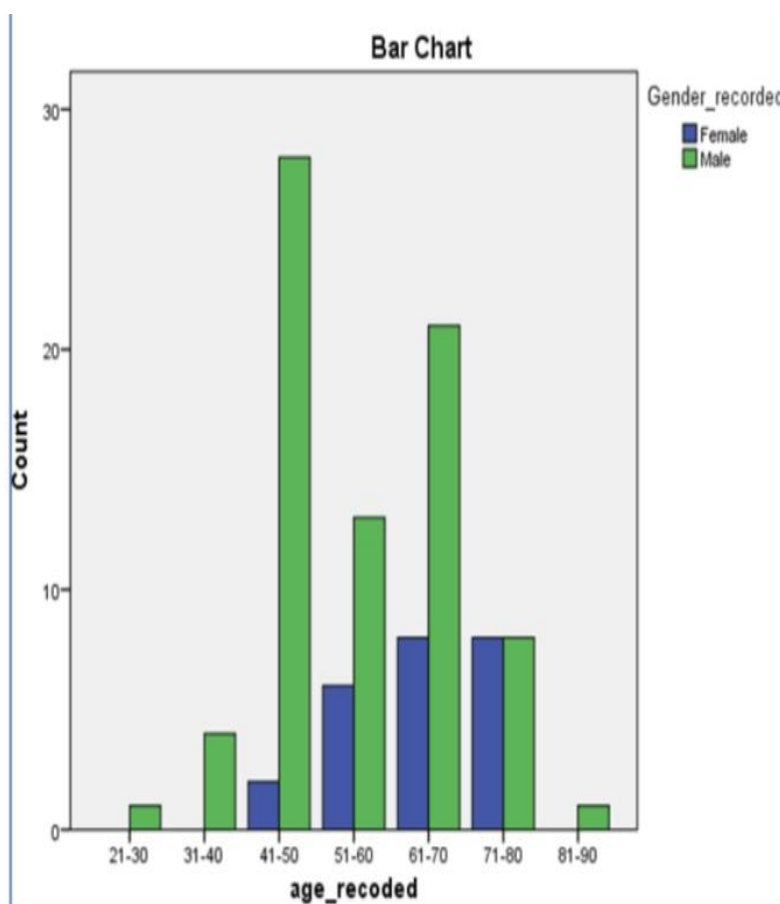


Fig. 1: Distribution of the study population with respect to age and gender

Diseases	Number of cases	Percentage
Hypertension	10	10
Diabetes	8	8
Ischemic Heart Disease (IHD)	7	7

Table 1: Family history of Non-Communicable Diseases

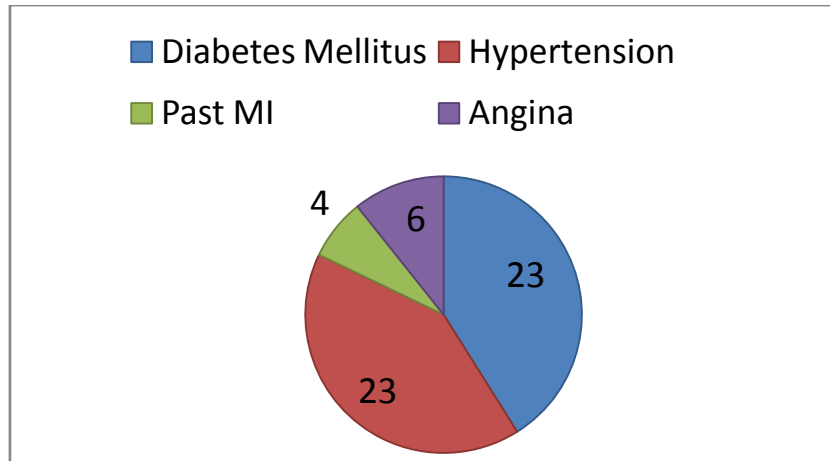


Fig 2: Distribution of risk factors for heart disease

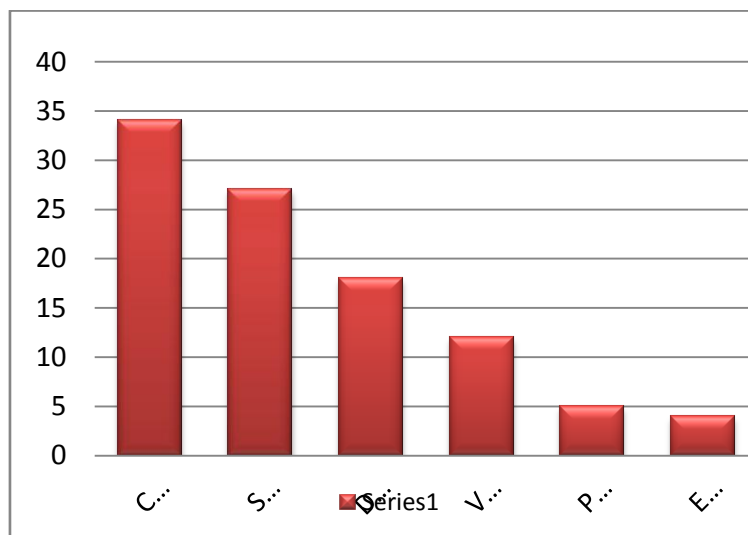


Fig.3: Pattern of various symptoms of Acute Myocardial Infarction

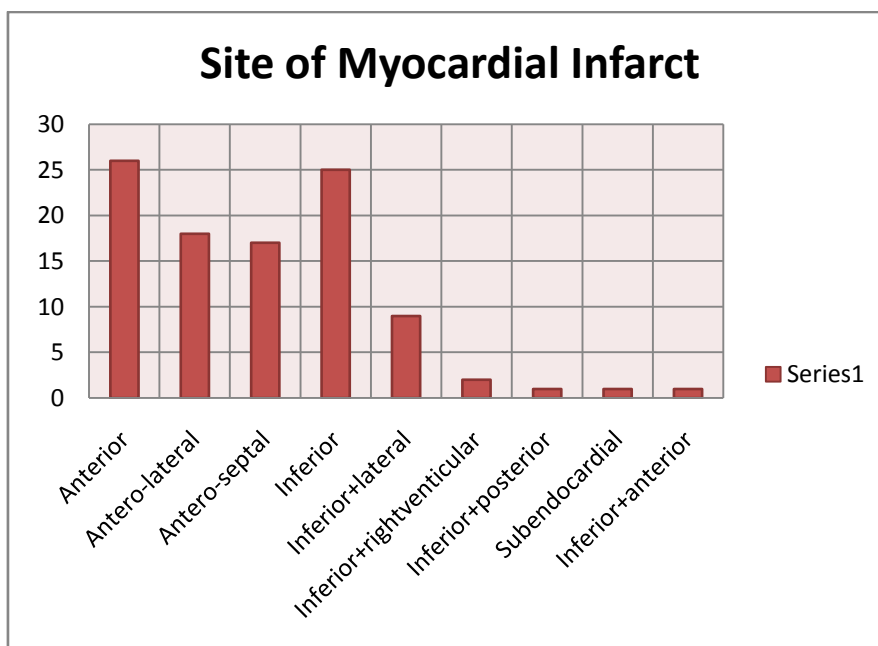


Fig.4: Pattern of incidence of Acute Myocardial Infarction based on site of infarct

III. Discussion

The maximum incidence of Acute MI as seen in the present study was in the age group of 41-70 years (78%). Only 5% of cases aged below 40 years. Incidence of this study almost compares well with incidence being 85% between 35 years and 75 years of age reported by Martin TC et al in 2007.

Incidence of type 2 diabetes mellitus was 23% in the present study as compared to 19% in Svensson AM et al study of 2007. In the present study, 23% had hypertension showing higher prevalence of Acute MI in disease group which is in agreement with Kokubo Y et al study in 2008.

Bradycardia is most common in proximal occlusion of right coronary artery commonly leading to inferior wall MI because of reflexes arising from ischemic right ventricle. In the present study, 12% had Sinus Bradycardia (SB) out of which 10 were purely in inferior and one each in inferior wall with right ventricular extension and inferior + posterior wall MI. In all these patients, SB was transient and majority of them had a normal sinus rhythm (NSR) by the end of one day. All the patients had NSR at discharge. Similar observations were made by Swart G et al. There was high mortality associated with Sinus tachycardia (ST) making it an adverse prognostic sign. In the present study, the mortality rate in patients with ST was 22% which is comparable to the study done by Crimm et al.

Atrial fibrillation is associated with increased in hospital mortality probably because it is associated with large infarction and is seen more commonly in patients with cardiac failure, complex ventricular arrhythmias, advanced AV block, atrial infarction and pericarditis. AF increases in incidence with age. In our study 100% mortality was seen in cases with AF. AF can be predicted as an independent risk factor for mortality in Acute MI. This goes in conjunction with Asanin M et al, and Pizzetti F et al.

In the present study, the frequency of Ventricular tachycardia (VT) was seen more in anterolateral MI than in anteroseptal MI which goes well with the study done by Horvat D et al. In the present study, mortality seen in patients with VT was 50% whereas than in study done by Gibson CM et al and Al Khatib et al, was 25.2% and 24% respectively. This discrepancy could be explained by larger infarcts and older age in our study.

Our study reported 21 patients (32.8%) of a total of 64 patients had Reperfusion Arrhythmia (RA) on the basis of rapid clinical and non-invasive marker (ST segment resolution) following streptokinase (STK). The same was reported by Osmanik PP et al.

IV. Conclusion

Acute Myocardial Infarction (AMI) is one of the major causes for hospital admission in the early with a male preponderance between 4th and 7th decade of life, the incidence being equal in both sexes beyond the 7th decade.

Cardiac arrhythmias routinely manifest during or following an acute MI. Earlier recognition and management of post MI arrhythmias can significantly modify the morbidity and mortality in myocardial infarction.

In this study, diabetes mellitus and hypertension were commonly associated with Acute MI. These are modifiable risk factors and can be tackled with drugs, public health education and life style modification.

Acute MI was commonly noticed in association with anterior wall with high incidence of tachyarrhythmias and higher mortality rates whereas persistence of sinus tachycardia was associated with higher mortality rates in Acute MI.

In this study, patients who developed Reperfusion Arrhythmias (RA) after thrombolysis have better prognosis (associated with lower mortality) than in patients who did not have RA. Thus RA is not an event of serious concern as they are usually well tolerated and are amenable to treatment. They in-fact indicate an effective reperfusion when present.

Early streptokinase therapy has a favorable impact on mortality in MI and hence should be tried in all the Acute MI patients who do not have contraindications for streptokinase therapy

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