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# OUTCOME IN PATIENTS PRESENTED WITH INFERIOR WALL MYOCARDIAL INFARCTION AND ARRHYTHMIAS

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**Abstract:**

***Background and objectives:*** *Arrhythmias remain an important cause of mortality in patients with inferior wall MI, despite significant progress. Most of these arrhythmias occur within the 1st twenty four hours. The objective of this study was to govern the type and time of onset of arrhythmia in patients with inferior wall acute myocardial infarction and its outcome.*

***Study Design:*** *A Prospective Study.*

***Place and Duration:*** *In the Department of Cardiology, NICVD Satellite Centre Hyder Abad for one year duration from January 2018 to January 2019.*

***Methods:*** *120 consecutive patients with myocardial infarction were selected for the analysis. Risk factors for heart disease were assessed based on physical examination, blood tests and medical history. Patients were observed for arrhythmias for 48 hours after the onset of myocardial infarction. Arrhythmia type and time have been reported.*

***Results:*** *48 out of 120 patients with myocardial infarction had cardiac arrhythmias. Age and gender did not have a statistically substantial consequence on the onset or type of arrhythmia. Most arrhythmias lasted for 1-12 hours, and complete heart block was the most common arrhythmia (40%). There was no statistically significant effect between smoking, alcohol, hypertension, diabetes, left ventricular dysfunction, thrombolysis and arrhythmias.*

***Conclusion:*** *It is concluded that people with inferior myocardial infarction and cardiac arrhythmias have high hospital mortality rate.*

***Key words****: Arrhythmias, acute myocardial infarction of the inferior wall, complete heart block, acute myocardial infarction, acute coronary syndrome.*

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## INTRODUCTION:

Despite significant improvement in the treatment of coronary artery disease, it relics the main foundation of mortality[1-2]. Most of these bereavements are accredited to the advancement of arrhythmias. About 26% of subjects have conduction disturbances within twenty four hours of MI. Virtually any arrhythmia can be related with acute myocardial infarction, including supraventricular tachyarrhythmias, bradyarrhythmias, atrioventricular block and ventricular arrhythmias. In acute myocardial infarction patients, some arrhythmias may be associated with coronary artery reperfusion. Most arrhythmias occur at the stage of intensive pre-hospital and coronary care, i.e. the 1st forty eight to seventy hours after the symptoms onset[3]. The main hypothesis regarding the main arrhythmia mechanism in the acute coronary occlusion phase is micro-reentry due to the lack of homogeneity in the ischemic myocardium electrical properties[4]. In the ischemic region, central cells have a comparatively steady rise in extracellular levels of potassium. The border area cells between the normal and ischemic region of the myocardium are depolarized partially only and therefore have greater potential for action[5-6]. A decrease in impulse conduction occurs in clearly depressed areas, causing cardiac arrhythmias such as ventricular fibrillation and polymorphic ventricular tachycardia. The electrophysiological cellular mechanism of reperfusion arrhythmias appears to involve the washing of various ions, such as potassium and lactate, and toxic metabolic substances embedded in the area of ischemia[7]. Cells in the re-conjugated areas of the myocardium may have slow response type action potentials. The malignant ventricular arrhythmias incidence related with an infarction is affected by the magnitude of the primary infarction. IWMI accounts for 42-51% of all acute myocardial infarctions with 2-9% mortality rate[8-9]. In the IWMI, Bradyarrhythmias are more common than in the anterior wall. The supreme usual bradyarrhythmia during acute MI is Sinus bradycardia and often occurs within the 1st four to six hours of ischemia. Atrioventricular block is observed in 9–33% of subjects with IWMI[10]. The early onset of the block is usually short-lived. Atrioventricular block first degree has no hemodynamic effect and does not require intervention. The average mortality rate was 29% with complete AV block. The purpose of this analysis was to determine the incidence of cardiac arrhythmia in acute inferior wall myocardial infarction during hospitalization and its outcome.

## MATERIALS AND METHODS:

This Prospective Study was conducted in the Department of Cardiology, NICVD Satellite Centre Hyder Abad for one year duration from January 2018 to January 2019. The patient was observed during hospitalization and arrhythmias, if at all.

**Inclusion criteria:** Patients over the age of 18 reporting to a cardiac care unit with acute myocardial infarction.

**Clinical data:** Detailed history of cardiac risk factors and full physical examination was performed with an emphasis on the cardiovascular system.

**INVESTIGATIONS:** A 12 lead electrocardiogram (ECG) was obtained at the time of hospitalization, 24 hours and 48 hours and during arrhythmias. EAGLE 1000 multi-parameter monitors were used to monitor patients for 48 hours looking for arrhythmias. All patients underwent routine blood tests and 2D analysis by echocardiography.

**Statistical analysis:** In this descriptive study in the hospital, a chi-square test was used to test for significance between different correlations. The P value was calculated for statistical significance, and $\leq 0.05$ was taken significant.

## RESULTS:

Of the 120 patients, 67 are male and 53 were female. The 51–70 years was the dominant age group.

**Cases Distribution by gender and age given in Table-I**

| AGE (in years) | FEMALE | MALE | TOTAL |
|---|---|---|---|
| <40 | 2 | 5 | 7 |
| 41-50 | 7 | 16 | 23 |
| 51-60 | 21 | 18 | 39 |
| 61-70 | 14 | 18 | 32 |
| 71-80 | 7 | 9 | 16 |
| >80 | 1 | 2 | 3 |
| Total | 67 | 53 | 120 |

For 120 cases, 43% had hypertension, 26% had diabetes, 30% smokers, 12% were alcoholics, and 15% had hypertension and diabetes.

**Risk factors distribution of cases in Table-II**

| Risk factors | Female | Male | Total |
|---|---|---|---|
| Hypertension | 22 | 21 | 43 |
| Diabetes | 15 | 11 | 26 |
| Smoking | 2 | 28 | 30 |
| Alcohol | 1 | 11 | 12 |

Most arrhythmias appeared during 1-12 hours of hospitalization.

**Arrhythmia time noticed in gender distribution in Table-III**

| Time | Female | Male | Total |
|---|---|---|---|
| Within 1st hour | 3 | 6 | 9 |
| 1-12 hours | 14 | 13 | 27 |
| 12-24 hours | 5 | 6 | 11 |
| >24 hours | 0 | 1 | 1 |

Arrhythmias were more common in males than in femlaes, but they were not statistically significant (p-value was 0.53). 73 out of 120 patients were thrombolysed. Arrhythmias are more common in people who were thrombolysed, but were not statistically significant (p-value was 0.17).

**Thrombolysis effect on arrhythmias given in Table-IV**

| Thrombolysis | No arrhythmia | Arrhythmia | Total |
|---|---|---|---|
| Done | 40 | 33 | 73 |
| Not done | 31 | 16 | 47 |
| Total | 71 | 49 | 120 |

Complete heart block was the most common arrhythmia. Sinus tachycardia and first degree heart block are more common in men.

**Different type of arrhythmias with relevance to gender distribution in Table-V**

| ARRHYTHMIAS | MALE | FEMALE | Total |
|---|---|---|---|
| SINUS TACHYCARDIA | 3 | 2 | 5 |
| SINUS BRADYCARDIA | 3 | 3 | 6 |
| Ventricular premature complexes (VPCs) | 2 | 0 | 2 |
| Atrial Fibrillation | 2 | 2 | 4 |
| 1st degree Heart Block | 6 | 2 | 8 |
| 2nd degree Heart Block type 1 | 1 | 4 | 5 |
| Complete Heart Block | 8 | 8 | 16 |
| VPC+ Sinus Bradycardia | 1 | 0 | 1 |
| VPC + 1ST degree Heart Block | 1 | 0 | 1 |
| JUNCTIONAL RHYTHM | 0 | 2 | 2 |
| TOTAL | 27 | 23 | 50 |

Hypertension, diabetes, smoking, alcohol consumption and left ventricular dysfunction did not significantly increase the risk of arrhythmias. Most arrhythmias spontaneously passed, which is 67.5%. Pharmacological intervention was required in 27.5% of patients, and electrical intervention was required in 5% of patients.

## DISCUSSION:

In 49% of individuals, arrhythmia were detected in this analysis. Most arrhythmias happened during the first hour of admission[11]. In the Aufderheide TP study, around 26% had cardiac conduction disorders within twenty four hours of the beginning of the infarction. In this study, 47% of patients had complete heart block with arrhythmia[12]. In Courter SR et al study of atrioventricular block, a common complication is acute myocardial infarction in the Inferior wall, which occurs in 9–33% of patients. In Rotman M. et al analysis, 20% occurrence of high degree block was found that complicated acute myocardial infarction[13]. Harpaz D et al study shows the complete heart block incidence complicating acute MI was less in the thrombolytic period than in the pre-thrombolytic period. In this analysis, 16% of individuals have 1st degree heart block. This block is mostly related with additional disorders of conduction[14]. When the first degree heart block is an isolated finding, it has no effect on hemodynamic and does not require interference. However, it is rare for the first degree heart block to progress to supplement the complete heart block during acute posterior and inferior myocardial infarction. The Framingham study showed that smokers reported a two to three fold rise in unexpected cardiac death between 30 and 50 years decade of life. This is the mian risk factor in which mortality from coronary artery disease increases relatively. However, in our study there was no statistically noteworthy association between

smoking and the onset of arrhythmia. In this study, 62% of arrhythmias occurred during the first 1-12 hours of hospitalization. In the Aufderheide TP study, 91% of acute myocardial infarction patients developed an abnormal heart rhythm within twenty four hours of the infarction onset[15]. In Scott DS et al study, heart failure, left ventricular dysfunction, or both have a greater sudden death risk within the first month after a myocardial infarction.

## CONCLUSION:

Arrhythmia followed in 40% of patients with IWMI and occurred during the first 1-12 hours of hospitalization. Complete heart block is the most common arrhythmia, accounting in about 40% of patients. There is no significant statistically variance in the incidence of arrhythmias in patients who were thrombolysed. There was no statistically substantial variance in the incidence and pattern of arrhythmias in patients with hypertension diabetes and / or left ventricular dysfunction.

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