

# Outcome of Patients with Right Ventricular Infarction in Inferior Wall Myocardial Infarction

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## ABSTRACT

**INTRODUCTION:** IWMI is associated with increased risk of death, shock, ventricular tachycardia or fibrillation and atrioventricular block (AVB), and a higher mortality rate for the first month post MI in patients with RVMI.

**AIMS & OBJECTIVES:** To study the complications and in-hospital mortality in IWMI with RVMI.

**MATERIALS AND METHODS:** A total of 100 patients of IWMI were recruited and screened for RVMI and complications and in-hospital mortality was recorded. **RESULTS;** It was observed that patients with IWMI had CHD, more commonly in RVI (7.14%) as compared with NRVI group (1.38%). Bradyarrhythmia was found in 7 cases (25%) in RVI group as compared to 3 (4.16%) in NRVI group which was statistically significant. ( $p=0.002$ ). A high mortality of 10.71% was observed in RVI group as compared to 2.77% in NRVI group ( $p=0.05$ ).

**DISCUSSION:** In the present study, prevalence of CHB and second-degree AV block was found to be 4% and 3%, respectively, among patients with IWMI, which is lower than earlier studies. In the present study, 1 patient presented with cardiogenic shock, in each group of IWMI. In our study, total in-hospital mortality in IWMI was found to be 5%, which is less than reported prevalence.

**CONCLUSION:** RVMI in IWMI is associated with some increased complications especially high degree AV block and CHB which harbour increased mortality.

**Keywords:** Right Ventricular Myocardial Infarction (RVMI), Inferior Wall Myocardial Infarction (IWMI), Atrioventricular block (AVB), Complete Heart Block (CHB), Right Ventricular Infarction (RVI). Non Right Ventricular Infarction (NRVI).

## INTRODUCTION

Recognition of the syndrome of RVMI is important as it identifies a significant clinical entity, which is associated with and is an independent predictor of major complications and in-hospital mortality after acute IWMI [1,2]. It is associated with increased risk of death, shock, ventricular tachycardia or fibrillation and atrioventricular block (AVB), and a higher mortality rate for the first month post MI in patients with RVMI even without hemodynamic impairment. These complications in RVMI may be due to the increased parasympathetic tone, sinoatrial (SA) node dysfunction, atrioventricular (AV) node dysfunction [2,3,4,].

Recent studies showed that 23.6% in-hospital patients with high degree AV block had significantly high mortality (13.4%) in acute inferior wall MI with RV involvement. In many studies, the mortality rate in patients with inferior MI and high degree AV block varies from 12-23% [5].

The best management of right ventricular involvement in acute myocardial infarction or cardiogenic shock requires early

recognition to ensure not only appropriate treatment but also to ensure that potentially dangerous therapies, such as vasodilators, nitrates, morphine, or beta blockers, are avoided [6]. Main purpose of selecting this study is to become aware of right ventricular infarction and its various complications like arrhythmias and conduction disorders which not only requires appropriate therapy but also avoidance of inappropriate therapy that might reduce right ventricular filling pressure and cardiac output and in turn prove disastrous.

### AIMS & OBJECTIVES

1. To study the complications of IWMI with RWMI
2. In-hospital mortality in patients of IWMI with RWMI

### MATERIALS & METHODS

This was a prospective clinical study conducted on patients admitted during a one year period in the Department of General Medicine, Govt. Medical College and Associated Hospitals, Jammu (J&K).

#### Patients were classified into two groups

A total of 100 patients were included in this study

- Group A: Inferior wall infarction with right ventricular infarction.
- Group B: Inferior wall infarction without right ventricular infarction.

Their clinical course was studied and compared. The clinical course and ECG analysis were compared in both the groups during their entire hospital stay. Complications viz ventricular tachycardia, AV blocks, hypotension, cardiogenic shock and deaths in both the groups were analyzed and compared.

### RESULTS

#### INCLUSION CRITERIA

Patients with evidence of acute inferior wall myocardial infarction as proved by 12 lead ECG along with right precordial leads and chest pain of duration less than 24 hours and increased serum cardiac enzymes Troponin-T, were considered in our study.

#### EXCLUSION CRITERIA

- Patients whose initial ECGs showed an anteroseptal or anterior wall myocardial infarction will be excluded because these infarctions, may produce an anteriorly oriented ST vector which may also cause ST segment elevation in the right precordial leads. For the same reason patients with pericarditis, left bundle branch block were excluded.
- Patients with chronic lung disease, cor pulmonale were excluded because they may be associated with a right ventricular dysfunction.
- Patients with previous history of a myocardial infarction were also excluded to avoid a false positive result for right precordial electrocardiography.

#### STATISTICAL ANALYSIS

The recorded data was compiled and entered in a spread-sheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Statistical software SPSS (version 20.0) and Microsoft Excel were used to carry out the statistical analysis of data. Categorical variables were summarized as percentages. Chi-square test or Fisher's exact test, whichever appropriate, was used for comparison of categorical variables. A P-value of less than 0.05 was considered statistically significant.

TABLE 1: ARRYTHMIAS AND CONDUCTION BLOCK

Complications	With RVMI		Without RVMI		Total	p-value
	N=28	%	N=72	%		
Atrial arrythmia	0		0		0	
VPCs	2	7.14	4	5.55	6	
VF	0		1	1.38	1	
1st degree AV block	3	10.71	1	1.38	4	0.02S

**Table 1 To Be Continued...**

2nd degree AV block	3	10.71	1	1.38	4	0.02S
Complete heart block	2	7.14	1	1.38	3	0.07NS
Bradyarrhythmia except sinus bradycardia	7	25	3	4.16	10	0.002S
Sinus tachycardia	2	7.14	4	5.55	6	
Sinus Bradycardia	4	14.26	8	11.11	12	0.51NS

It was observed that patients with IWMI had CHB more commonly with RVI (7.14%) as compared with NRVI group (1.38%). Bradyarrhythmia was found in 7 cases (25%) in RVI group as compared to 3 (4.16%) in NRVI group which was statistically significant. (p= 0.002).

**TABLE 2: CAUSE OF MORTALITY**

CAUSE	With RVMI		without RVMI		Total
	N=28	%	N=72	%	
Cardiogenic shock	1	3.57	1	1.38	2
Ventricular fibrillation	0		1	1.38	1
CHB	2	7.14	0		2

Cardiogenic shock was the cause of death for 1 case in each group. 2 patients (7.14%) died of CHB which did not respond to treatment.

Ventricular fibrillation caused death in 1 patient in NRVI group.

**TABLE 3: MORTALITY IN TWO GROUPS**

	With RVMI		without RVMI		Total
	N=28	%	N=72	%	
Mortality	3	10.71	2	2.77	5

A high mortality of 10.71% was observed in RVI group as compared to 2.7% in NRVI group (p= 0.05) (Fischer's exact test).

## DISCUSSION

IWMI is no longer a term of oblivion, but there are a few inconsistencies in its context that call for clarification. The prognosis is made worse by the frequency of complications such conduction blocks and RV infarction. Therefore, the primary emphasis of this investigation was on IWMI related problems that negatively impacted clinical outcomes and the prognosis for the Indian population. In the present study, prevalence of CHB and second-degree AV block was found to be 4% and 3%, respectively, among patients with IWMI, which is lower than earlier studies. Berger et al. [7] reviewed data published before 1989 and documented CHB in 12% of patients with IWMI, with an additional 7% having second-degree AV block. More recent reports with equivalent sample sizes have

noted similar incidence of CHB [8, 9]. In our study an in-hospital mortality rate of 2% was found in IWMI patients with presence of conduction defects (CHB) and all cases (2%) were from the RVMI group. Present results are lower value than with results demonstrated by Harpaz et al. [10], which indicated that mortality rate was 4 times higher in patients with CHB compared with counterparts who did not develop this complication. Previous studies have demonstrated that AV block is not an independent predictor of mortality, but rather it is a marker of larger infarct size, which ultimately causes poor prognosis [9,11].

In the present study, 1 patient presented with cardiogenic shock, in each group of IWMI. This is not consistent with results demonstrated by Malla et al. [12], which indicated prevalence of cardiogenic shock was significantly greater in IWMI patients with RV infarction. Also our study was inconsistent with incidence of CHB that was found to be between 33% and 66% in IWMI patients with RV infarction in a study by Braat et al. [13]. In our study, total in-hospital mortality in IWMI was found to be in 5%, less than reported prevalence. In concordance with previous studies, however, mortality was found to be higher percentage in IWMI patients with RV infarction (3% vs 2.77%). Here, it should be taken into consideration that in presence of AV block, there is loss of atrial contribution to ventricular filling, and this may be of critical importance in presence of acute RV dysfunction.

Zehender et al. [14] reported in-hospital mortality in IWMI patients with RV infarction to be 31% compared with 6% for patients without RV infarction. Mortality observed in our study was less.

## CONCLUSION

RVMI in IWMI is associated with some increased complications especially high degree AV block and CHB which harbour increased mortality, so every IWMI patient should be screened for RVMI and monitored for possible complications.

### Declaration by Authors

**Ethical Approval:** Approved

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**Conflict of Interest:** The authors declare no conflict of interest.

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