



ACUTE INFERIOR MYOCARDIAL INFARCTION;

COMPARISON OF MORTALITY IN HOSPITALIZED PATIENTS WITH OR WITHOUT RIGHT VENTRICULAR INFARCTION

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INTRODUCTION

Acute coronary syndrome (ACS) has become an epidemic in the developing countries and it is still considered a major problem in the developed world.¹ One of the major killers of population is acute MI and the major reason behind it is, much higher rate of complications in both STEMI and NSTEMI. Much advances have been made in the diagnosis and management of ACS but still it is the major problem of both developed and developing countries. So it is truly said that cardiovascular disease (CVD) is one of the leading cause of death.²

In many parts of the world, CVD has become a significant chronic disease and it was predicted at the start of 21st century that it will become the main cause of disability and death worldwide. By 2020, it is predicted that CAD will exceed infectious disease as the world's number one cause of death and disability.^{3,5}

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ABSTRACT... Objectives: To compare the frequency of mortality in hospitalized patients with acute inferior wall myocardial infarction with or without right ventricular infarction. **Study Design:** Cohort study. **Setting:** Faisalabad Institute of Cardiology, Cardiology Department. **Period:** 2013-2014. **Materials and Methods:** 180 patients of acute inferior wall myocardial infarction were included after obtaining informed consent. Group A (exposed) had acute inferior wall myocardial infarction with right ventricular infarction and group B (un exposed) had patients with inferior wall MI without right ventricular infarction. **Results:** Out of 180 patients, 150(83.3%) were male and 30(16.7%) were female. In group A, patients having Hypertension 25(27.8%), Diabetes Mellitus 35(38.9%), Smoking 40(44.4%) and Dyslipidemia 13(14.4%). In group B, Diabetes Mellitus present in 26(28.9%), Hypertension 22 (24.4%), Smoking 23(25.6%) and Dyslipidemia 19(21.1%). In hospital mortality in group A(exposed) was 9(10%) and in group B(un Exposed) was 4(4.4%). **Conclusion:** The mortality with inferior wall MI with right ventricle infarction was higher than patients without right ventricle infarction, although no statistical difference was found.

Key words: Acute Coronary Syndrome, Percutaneous Coronary Intervention, Right Ventricle Infarction.

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Acute IWMI associated with right ventricular infarction (RVI) occurs in 50 % cases especially after the occlusion of proximal RCA.⁶ Isolated RVI is seen in 3 % to 5% of autopsy proven cases of MI. The clinical triad of RVI rests on hypotension, increased JVP and clear Lungs.⁷ Additional diagnostic techniques include the ECG (ST-segment elevation in V3R to V4R⁸ and wall motion abnormality of RV on echocardiography.⁹

The major cause of death in patients with acute RVI is cardiogenic shock, thus RVI complicating IWMI has high in- hospital morbidity and mortality and it is an independent predictor of major complications and mortality.¹⁰

Only limited number of studies has been conducted in patients of AIWMI with RVI in Pakistan. The aim of present study is to compare the mortality in hospitalized patients with AIWMI with or without RVI, so that the patients can be

stratified according to the risk. This will help in early recognition, proper treatment and reduction in the mortality in this high risk group.

MATERIALS AND METHODS

This cohort study was conducted at Faisalabad institute of cardiology in 2013-2014. 180 patients of Acute IWMI were enrolled after obtaining informed consent. Group A (exposed) had Acute IWMI with RVI and group B (unexposed) had patients of IWMI without RVI.

Presence of any two of the following criteria define Acute IWMI:-

1. History of ischemic chest pain >30 minutes.
2. ECG finding (ST-segment elevation > 1mm in leads II, III, AVF).
3. Rise of cardiac troponins > 0.30 ng/ml.

RVI was diagnosed on ECG performed after admission in emergency. An ECG criterion used for RVI was ST-segment elevation > 0.1 mV in V3R or V4R.

In hospital mortality means the death of patients from IWMI during 05 days of hospital admission. Male and female patients were included between 250-70 years of age having IWMI presenting within 12 hours of onset of pain and thrombolysed with streptokinase. Exposed group includes those who have IWMI with RVI (group A) and unexposed group having no RVI (group B). Exclusion criteria was previous history or record of MI. Patients developing conduction complications of MI, creatinine level >2.0 mg/dl and those who are not thrombolysed with streptokinase.

180 patients including both genders, fulfilling the inclusion criteria, from Department of Emergency FIC, Faisalabad were collected. Informed consent obtained from all the patients. Risk factors for cardiovascular disease such as hypertension, DM, dyslipidemia and smoking from each patient were noted. 5ml blood for the routine blood investigations like CBC, RBS, blood urea, serum creatinine and cardiac troponins was drawn from each patient. ECG of every patient taken.

All patients receive standard medications of MI, including thrombolysis by Streptokinase. Patients were divided into two groups. Group A

(exposed group) had AIWMI with RVI and group B (unexposed) had AIWMI without RVI. All the patients remain admitted in hospital for minimum of 5 days. All the patients monitored and mortality noted. All these information's collected through prescribed proforma.

STATISTICAL ANALYSIS

Data was collected on predesigned Proforma by researcher himself. The collected information was analysed by SPSS software. The confounding variables like age, sex, hypertension, DM, dyslipidemia, and smoking were controlled by stratification. Mean and standard deviation calculated for age. Frequency and percentage calculated for sex, hypertension, DM, dyslipidemia, smoking and in-hospital mortality. Chi-Square test used to compare in-hospital mortality between two groups. P-value less than 0.05 taken as significant. Relative risk was calculated.

RESULTS

In this study, patients were divided into four age groups of less than forty, 41-50, 51-60 and 61-70 years. 41-50 years age group had maximum number of patients. Patients having age less than 40 years were only 9.4 % with youngest patient of 26 years and eldest being 69 years and mean age 50.45 with standard deviation of 8.71. (Table-I)

Mostly patients were of male gender. Total numbers of females were only 30. Statistically no significant mean difference of sex was found between patients of study groups ($p > 0.05$). (Table-I). More patients of IWMI with RVI were hypertensive. However, no statistical significant difference was found between patients of both groups. P Value = 0.611 (Table-I).

One third of patients were having diabetes and mostly in group of IWMI with RVI than without RVI. No statistically significant difference was found between patients of both groups. P value = 0.156 (Table-I).

The patients of dyslipidemia were very low in number. Only 32 patients were dyslipidemic and mostly were IWMI without RVI. No statistically

significant difference was found between patients of both groups. P value = 0.242 (Table-I).

Smoking was present in 35% of the enrolled patients. This proportion is higher than other risk factors. More patients in group having IWMI with RVI were smoker as compared with patients without RVI. Statistically significant difference was found between patients of both groups. P value

= 0.008 (Table-I).

Smoking was the most prevalent risk factor in patients died with inferior wall MI, followed by DM, hypertension and dyslipidemia. In patients having hypertension, DM and dyslipidemia, no statistically significant difference was found in mortality. The statistically significant difference was found in smokers only. (Table-II)

Characteristics	Group I with RVI n=90	Group II without RVI n=90	Total n=180	P Value
Age	50.45±8.71	50.45±8.71	50.45±8.71	
Gender	Male =79(87.8%) Female =11(12.2%)	Male =71 (78.9%) Female=19(21.1%)	150(83.3%) 30(16.65%)	>0.05
Diabetes	35 (38.9%)	26 (28.9%)	61 (33.9%)	0.156
Hypertension	25 (27.8%)	22 (24.4%)	47 (26.1%)	0.611
Smoking	40 (44.4%)	23 (25.6%)	63 (35.0%)	0.008
Dyslipidemia	13 (14.4%)	19 (21.1%)	32 (17.8%)	0.242
In hospital mortality	9 (10.0%)	4 (4.4%)	13 (7.2%)	0.150

Table-I. Distribution of patients according to risk factors and RV infarction

This study enrolled total 180 patients, out of which 13 patients died. The mortality among patients with inferior wall MI with RVI came out to be higher than patients without RVI as 9 patients out of these 13 were with RVI. However, no statistically significant difference was found between patients of both groups. P Value = 0.150 (Table-I).

Out of total died patients, 8 were females and 5 males. Mostly females were elderly (Table-II).

Characteristics	In hospital mortality	P value
Diabetes	8 (13.1%)	0.029
Hypertension	4 (8.5%)	0.69
Dyslipidemia	3 (9.4%)	0.60
Smoking	10 (15.9%)	0.001
Gender	Male=5 (3.33%) Female=8(26.66%)	

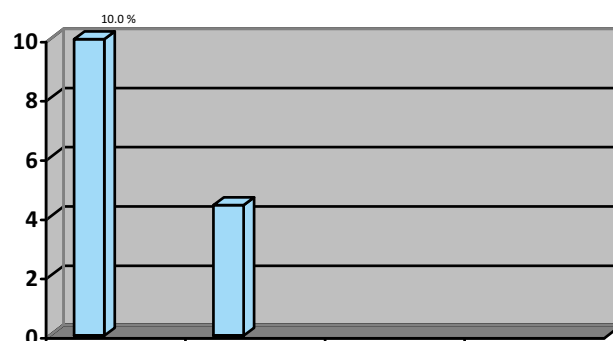
Table-II. Distribution of patients having in hospital mortality and associated risk factors

DISCUSSION

The aim of this study was to compare the mortality in admitted patients with Acute Inferior MI with or without RVI, so that the patients can be stratified according to the risk.

This will help in early recognition, proper treatment

and reduction in the mortality in high risk group.



RVI in Acute IWMI was identified on the basis of clinical findings and ECG changes. Hypotension, raised JVP and clear lung bases in the setting of inferior wall MI are supportive of RVI clinically. Right sided chest leads were used for diagnosis. The extent of RV infarction varies in different studies and echocardiographic examination of the RV can further clarify the severity of the disease.

In this study, group A, patients had HTN 25(27.8%), DM 35(38.9%), Smoking 40(44.4%) and dyslipidemia 13(14.4%). In group B, DM was present in 26(28.9%), HTN 22 (24.4%), Smoking 23(25.6%) and dyslipidemia 19(21.1%). In

hospital mortality in group A was 9(10%) and in group B was 4(4.4%). ($p = 0.150$). The mortality with IWMI with RVI was greater than patients without RVI, although, no statistically significant difference was found between two groups. Most of the patients were between 41 to 50 years of age. Only small numbers of patients were present at extreme of ages, less than 40 and 60-70 years.

More patients were in relatively younger age group as compared to the Western countries in which ischemic heart disease is prevalent in relatively elder age group. This shows that CVD starts at an earlier age than that in the West and thus mortality ratios as compared to other ethnic groups are highest in the South Asians. This was also elaborated in many studies which showed that 16.1% of the overall population with IHD in Pakistan are less than 45 years of age and 19% of the patients diagnosed with IHD were less than 40 years.¹¹ In Courage trial¹² the mean age as 62 ± 5 years. This shows the fact that Pakistani patients are at least 10 years younger to those in West.

Most patients were male. Total numbers of females were only 30 and mostly those having IWMI without RVI. The mortality in female group was higher than males. This impression was also supported by many trials.¹³ The reason for the increased mortality in women was found to be their elder age, more comorbidity and more delay before reaching medical care for severe chest pain than men.¹⁴

In this study smoking came as a leading risk factor for CAD. Almost all males were smoker. In hospital mortality was also highest in smokers. Non-smokers, on average were approximately 11 years older and were more often females. This study showed smoking to be positively co-related with IHD ($p: 0.008$). The results of this study are in concordant with international studies, such as in both the Framingham study and British regional Heart study, the rate of IHD in smokers is about 3 times that of non-smokers. It is concluded from various studies that reductions in risk of IHD could be obtained by tackling the smoking which is the most important modifiable risk factor.¹⁵

Smoking of 3-5 cigarettes per day significantly increased the risk of developing IHD and all-cause mortality. The relative risk was higher in women.¹⁶ Outcome of CVD is more dangerous amongst smokers who started smoking at an earlier age and there is a slightly greater risk for female smokers relative to male smokers.

One third of patients in this study were diabetics, mostly in group having IWMI with RVI. Most of the died patients (8/13) were diabetics. The prevalence of DM in Pakistan is 7.6%. This devastating disease has affected more than 9.3 million individuals between the ages of 20-79 years.¹⁷ By 2025 this number will increase to approximately 300 million.¹⁸ In Pakistan, mortality due to DM is very high. Diabetes killed 88,014 patients in 2010.

This increased mortality in diabetic patients was also documented in previous international studies.¹⁹ Diabetic men alone had an absolute excess risk of death due to IHD of about 25 per 10,000 person-years. Diabetes and any other CVD risk factor like hypertension, hypercholesterolemia, or cigarette smoking increased this risk to 47 per 10,000 person-years and if all are present then the risk was 78 per 10,000 person-years.²⁰

In this study only 18 percent patients were dyslipidemic, most of those had IWMI without RVI. Three patients dying of MI had dyslipidemia. Dyslipidemia prevalence is different in different regions of world. It was highest in the WHO Region of Europe (54% for both sexes). The WHO African Region showed the lowest percentages (22.6% for AFR).

Hypertension was present in one fourth of patients. Mostly, it was present in patients with IWMI with RVI. Many patients were diagnosed as hypertensive at first time on admission. Many studies reported that hypertension was associated with an increased rate of adverse outcomes after MI.²¹ In GUSTO-1 trial it was found that there is higher risk of early death in patients with high systolic blood pressure at admission.²²

An in-hospital mortality rate of 31%, compared with 6% was reported in patients with AIWMI and RVI in international studies.²³ In our study in hospital mortality was three times higher in IWMI with RVI as compared to isolated inferior myocardial infarction (10% Vs 4%, $p=0.150$).

The results of the present study showed that an accurate diagnosis of RVI should be performed as soon as possible in all patients with acute IWMI as RVI is a strong independent predictor of a poorer outcome in patients with MI. The mortality with IWMI with RVI is greater than patients without RVI. However, it was also found that the influence of RVI on mortality changes with age, from an insignificant effect in young patients to a severe increase in mortality risk in the elderly. Previously 27% frequency of RVI in acute IWMI was observed in Pakistan with higher rate of in hospital mortality.^{24,25}

CONCLUSION

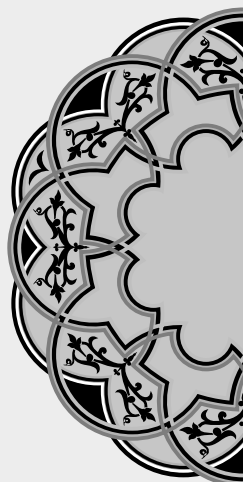
It was concluded that patients of inferior wall MI with RVI had greater mortality and morbidity as compared with patients having IWMI without RVI. Smoking was a leading risk factor for CAD. The only statistically significant difference in mortality was found between patients of both groups in smokers. To conclude, by taking a little extra effort and doing right precordial leads, while taking conventional leads, mortality in IWMI may be reduced by diagnosing RVI early.

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“A life spent making mistakes is more honorable than a life spent doing nothing.”

Unknown

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