



## ACUTE INFERIOR WALL MYOCARDIAL INFARCTION PRESENTING WITH RIGHT VENTRICULAR INFARCTION AT A CARDIAC CARE TERTIARY SETTING

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### ABSTRACT

**Background:** Infarction is a segmental illness of the myocardium caused by a focal blockage of one of the three main coronary arteries (CA) or one of its branches during a specific event, which impairs contractility only in the segment that is affected. Extensive inferior-posterior myocardial infarctions are frequently accompanied by right ventricular infarctions (RVIs).

**Objective:** The study aimed to determine the frequency of acute inferior wall myocardial infarction presenting with right ventricular infarction at a cardiac care tertiary setting

**Study Design:** A cross-sectional study

**Place And Duration:** This study was conducted at Isra University Hospital Hyderabad, Pakistan. from February 2022 to February 2023.

**Methodology:** Using the total population sampling method 116 patients were included in the study who presented with acute inferior wall myocardial infarction (IWMI), more than 1.0 mm ST segment elevation on right-sided chest leads that is V3R and V4R and were confirmatory for Right ventricular involvement. Data was entered and analyzed using SPSS version 23. The numerical variables were presented in descriptive statistics i.e. mean and SD while we presented the categorical data in frequency and percentages. We used the Chi-Square test of association to determine the strength of the association between the variables.

**Results:** There were 116 study participants who presented with inferior-wall MI. The mean age of the patients were  $56 \pm 8.2$  years, Mean BMI was  $27.3 \pm 2.1$  Kg/m<sup>2</sup>. Amongst them, 69 (59.48%) were male. The highest 73 (62.93%) proportion of the participants were overweight. In this study, more than two-fifths 51 (43.97%) were smokers, there were 53 (45.69%) participants had diabetes,

and 81 (69.83%) patients reported having hypertension. Nearly two-thirds 76 (65.52%) reported having an urban residence. The frequency of the right ventricular infarction in inferior wall myocardial infarction was 35(30.17%) and 81(69.83%) had no right ventricular infarction.

**Conclusion:** The study found that patients who report acute inferior MI in cardiac care settings have a reasonable proportion of RV infarction.

**Keywords:** Acute myocardial infarction, Inferior wall myocardial infarction, Right ventricular infarction.

## INTRODUCTION

Infarction is a segmental illness of the myocardium caused by a focal blockage of one of the three main coronary arteries (CA) or one of its branches during a specific event, which impairs contractility only in the segment that is affected [1,2]. Atherosclerotic coronary artery disease (CAD) is a major contributor to myocardial infarction (MI). It increases the risk of plaque rupture and the formation of clots, and it causes artery stenosis. MI was formerly thought to be a condition that primarily affected the left ventricle (LV). Extensive inferior-posterior myocardial infarctions are frequently accompanied by right ventricular infarctions (RVIs).

When a patient has an inferior wall myocardial infarction, the RVI diagnosis should always be considered. Similar symptoms and signs can be found with left ventricular infarction and RVI. Clinically, RVI is identified in patients with acute inferior-posterior wall infarction by the triad of hypotension, increased jugular venous pressure (JVP), and clear lung fields [3, 4]. RVI can be accurately diagnosed by looking for acute ST-segment elevation in the right precordial leads (V3R to V6R). A total of 60–90% of patients with acute RVMI show ST segment elevation >0.1 mV in the right precordial leads, especially V4R [5]. It is substantially correlated with serious complications and in-hospital mortality and correlates with lower right ventricle (RV) ejection fraction [6, 7].

For this heart injury's mortality and consequences to be reduced, early diagnosis of RVI is essential. Compared to inferior infarctions without right ventricular involvement, which has a death rate of approximately 6%, inferior infarctions with RVI have a high mortality rate of 25% to 30%. Around 50% of RV infarctions, present with dysrhythmias including bradycardia, severe atrioventricular block, and atrial fibrillation [7]. The development of RV infarction has a female predominance, according to Lempereur et al. [8]. Patients presenting with RV infarct are expected to have an in-hospital mortality rate of 14%, according to Goldstein et al [9].

The current study was conducted to determine the frequency of acute inferior wall myocardial infarction presenting with right ventricular infarction at a cardiac care tertiary setting

## METHODOLOGY

Using the total population sampling method 116 patients were included in the study who presented with acute inferior wall myocardial infarction (IWMI). In this study, we excluded those patients who reported to have cardiovascular disease, myocarditis, acute pericarditis or unstable angina. A complete examination was done to label the diagnosis of inferior wall myocardial infarction. Besides the sociodemographic data, Echocardiograph and echocardiogram were done for all the study participants. More than 1.0 mm ST segment elevation on right-sided chest leads that is V3R and V4R were confirmatory for Right ventricular involvement. Further, we confirmed the Right ventricular involvement using the echocardiograph in which evidence of right ventricular akinesia, hypokinesia, dilatation, or new tricuspid regurgitation was evident.

Data was entered and analyzed using SPSS version 23. The numerical variables were presented in descriptive statistics i.e. mean and SD while we presented the categorical data in frequency and percentages. Since the dependent and independent variables in the study hypothesis were categorical, we used the Chi-Square test of association to determine the strength of the association between the variables.

## RESULTS

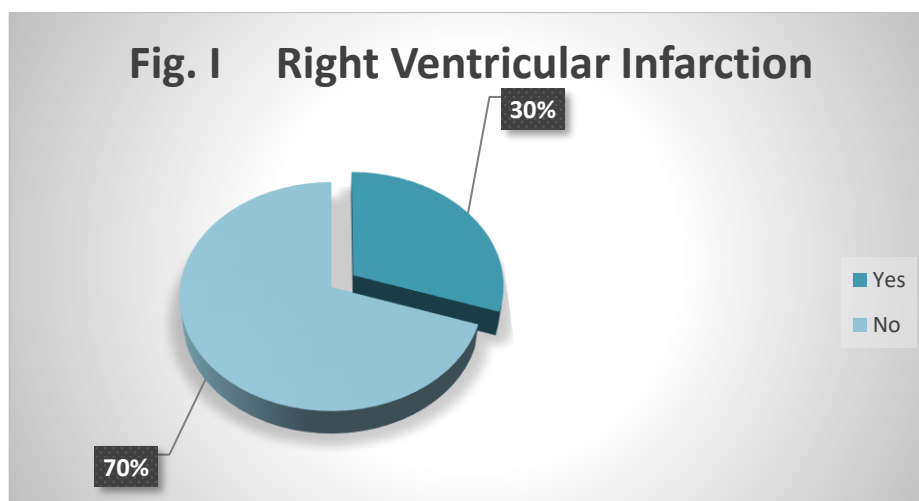
In the present study, there were 116 study participants who presented with in-wall MI. The mean age of the patients were  $56 \pm 8.2$  years, Mean BMI was  $27.3 \pm 2.1$  Kg/m<sup>2</sup>. (As shown in Table I). Amongst them, 69 (59.48%) were male and 47 (40.52%) were female. Overall 79 (68.4%) of the participants were more than 50 years old. The highest 73 (62.93%) proportion of the participants were overweight. In this study, more than two-fifths 51 (43.97%) were smokers, there were 53 (45.69%) participants had diabetes, and 81 (69.83%) patients reported having hypertension. Nearly two-thirds 76 (65.52%) reported having urban residence (As shown in Table II). The figure I describes the frequency of the right ventricular infarction in inferior wall myocardial infarction where 35(30.17%) had reported having right ventricular infarction and 81(69.83%) had no right ventricular infarction.

**Table I** Descriptive Statistics of the Study Participants

Variables	Min	Max	Mean	SD
Age (Years)	32	81	56	$\pm 8.2$
BMI (kg/m <sup>2</sup> )	23.4	34.1	27.3	$\pm 2.1$

**Table II** Socio-demographic and General characteristics of patients in the study.

Variable	n	%
<b>Age (years) <math>56 \pm 8.2</math> years</b>		
< 50	79	68.10
$\geq 50$	37	31.90
<b>Gender</b>		
Female	47	40.52
Male	69	59.48
<b>Body mass index (kg/m<sup>2</sup>)</b>		
Normal	15	12.93
Overweight	73	62.93
Obese	28	24.14
<b>Co-morbid conditions</b>		
Smokers	51	43.97
Diabetes mellitus	53	45.69
Hypertension	81	69.83
<b>Residence</b>		0.00
Rural	40	34.48
Urban	76	65.52



## DISCUSSION

It has been shown that 20% or more of individuals with IWMI brought on by the right coronary artery (RCA) have cardiac magnetic resonance imaging (CMR) evidence of a persistent RVI. It was discovered that patients with permanent RVI have more severe left and right ventricular dysfunction and greater LV infarct sizes [10]. A well-established prognostic indicator linked to a higher likelihood of unfavourable outcomes following primary PCI is a larger infarct size [11].

In the present study, we observed that the frequency of the right ventricular infarction in inferior wall myocardial infarction, 35(30.17%) had reported having right ventricular infarction and 81(69.83%) did not.

The prevalence and effects of RVI in IWMI have also been examined in a number of earlier research. About 27% to 48.5% of IWMI cases have been documented to have RVI [12-18]. Similar to our findings, Samin A et al. reported RVI in 27% of patients with IWMI, and they also found no statistically significant correlation between the frequency of RVI and patient age or gender [19]. A total of 28.0% RVI was found in individuals with acute IWMI in a different study conducted in our local population by Saif M. et al. [20].

In the present study, the highest 73 (62.93%) proportion of the participants were overweight. In this study, more than two-fifths 51 (43.97%) were smokers, 53 (45.69%) participants had diabetes, and 81 (69.83%) patients reported hypertension. A study by Zehender et al. revealed a higher prevalence of ventricular fibrillation and persistent ventricular tachycardia in patients with RV involvement, while Barrillon et al. highlighted the increased risk of conduction issues in individuals with RV involvement [21].

While a study by Zehender et al. found that patients with RV involvement as shown by an ECG had a greater frequency of ventricular fibrillation and prolonged ventricular tachycardia [22]. Based on right ventricular involvement, Mehta et al. conducted a large-scale investigation that examined the clinical symptoms and prognosis of individuals with acute myocardial infarction [23].

## CONCLUSION

The study found that patients who report acute inferior MI in cardiac care settings have a reasonable proportion of RV infarction. These results suggest that acute inferior wall myocardial infarction may have a reasonably independent consequence of right ventricular infarction.

## COMPETING INTERESTS

Authors declared no competing interests

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