

ORIGINAL RESEARCH**Study of risk factors and outcome for right ventricular infarction: What's new****¹Dr Pradeep Prajapati, ²Dr Arun. V, ³Dr Rajkishori Prajapati, ⁴Dr Rakesh Gaharwar**¹Associate Professor, Department of Medicine, Gajra Raja Medical College, Gwalior, MP, India²Junior Resident, Department of Medicine, Gajra Raja Medical College, Gwalior, MP, India³Consultant Gynecologist, Parivar Superspeciality Hospital, Gwalior, MP, India⁴Professor, Department of Medicine, Gajra Raja Medical College, Gwalior, MP, India**Correspondence:**

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Email: drpradeep2512@gmail.com**Abstract****Background:** Right ventricular infarction leads to hemodynamic instability, atrio-ventricular conduction blocks, and in-hospital mortality in patients with inferior wall myocardial infarction. The present study was conducted to assess risk factors and outcome for right ventricular infarction.**Materials & Methods:** 60 cases of inferior wall MI admitted to the Medicine or Coronary Care ICU G. R. Medical College, Gwalior (M.P.) were studied. All Subjects were subjected to anthropometric measurements and routine biochemical tests – Hemogram, Urea, Serum Creatinine, LFT, Lipid Profile. All patients were subjected to ECG and 2d Echocardiography.**Results:** 14 patients with IWMI with RVMI gives a history of hypertension and 6 patients of IWMI associated with RVMI gives a history of diabetes, 21 patients give history of smoking, 8 family history and 1 hypotension. There is a significant association between CHB and IWMI with RVMI.**Conclusion:** There is significant association between smoking, hypotension, diabetes, CHB patients with IWMI with RVMI compared to patients without RVMI.**Key words:** smoking, hypotension, ventricular infarction**Introduction**

Even though the RVMI is seen in much number of cases clinically but the incidence of RVMI is very less than seen at autopsy.¹ The main reason for the above difference is the difficulty in diagnosing RVMI in living patients. Also, the right ventricular dysfunction and stunning frequently is of a transient nature, such that calculation of its true incidence is even more difficult.²

Right ventricular infarction leads to hemodynamic instability, atrio-ventricular conduction blocks, and in-hospital mortality in patients with inferior wall myocardial infarction. Systolic right ventricular function is an important determinant in the event of myocardial infarction.³ Even after this initial study about twenty years ago, this condition has received little clinical importance till recent years. As compared with all clinical variables available at the time of admission, RVMI is associated with a relative risk of hospital death of 7.7 and a risk of major hospital complications of 4.7.⁴ The main hemodynamic derangements associated with right ventricular infarction render the affected patient sensitive to decreased preload and loss of

atrio ventricular synchronisation. These two events can result in a severe decrease in right and, secondarily left ventricular output.⁵

Cardiogenic shock and the need for temporary trans venous cardiac pacing are more common in patients with right ventricular dilatation. Furthermore, by implying multivessel coronary artery disease, the presence of right ventricular dysfunction carries an adverse prognosis irrespective of infarct location.⁶ The demonstration of right ventricular dysfunction is important because it is often associated with a distinct clinical syndrome requiring specific management. In the presence of low cardiac output volume loading to restore left ventricular filling pressure is required. Inappropriate vasodilator and/or diuretic therapy may prove fatal.⁷ The present study was conducted to assess risk factors and outcome for right ventricular infarction.

Materials & Methods

The present study was conducted among 60 cases of inferior wall MI admitted to the Medicine or Coronary Care ICU G. R. Medical College, Gwalior (M.P.).

Data such as name, age, gender etc. was recorded. Inclusion criteria was cases of inferior wall of either gender. Exclusion criteria was all other cases of which may cause abnormally oriented ST vector in the right precordial leads such as acute Inferior Wall MI other than Inferior Wall MI, acute Pericarditis, bundle branch blocks, patients with chronic lung disease with cor pulmonale because they may be associated with a right ventricular dysfunction, history of chest pain of more than 24 hours duration and subjects who do not provide consent for the study.

The diagnosis of acute inferior wall myocardial infarction was made with a typical history of chest pain less than 24 hours, ST segment elevation in leads II, III and avF and by development or pathological q waves in the above mentioned leads with positive serum cardiac enzymes (CK-MB or Troponin-T). Study includes patients of IWMI with and without RVMI (Right Ventricular Myocardial infarction). All Subjects were subjected to anthropometric measurements and routine biochemical tests – Hemogram, Urea, Serum Creatinine, LFT, Lipid Profile. All patients were subjected to ECG and 2d Echocardiography. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

Results

Table I Age group distribution and IWMI

Age group	Frequency
0 -20	0
20-40	8
40-60	26
60-80	25
80-100	1
Total	60

Table I shows that average age of 60 subjects was 58.33. Maximum number of subjects were in age group 40 to 60 (43%) followed by 60 to 80(41%).

Table II IWMI with RVMI and sex distribution

Sex	IWMI + RVMI	%
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Male	11	91.66
Female	1	8.33
Total	12	100

Table II shows that IWMI + RVMI was seen in 11 male and 1 female.

Table III IWMI and BMI distribution

BMI	IWMI	%	P value
<18.5	0	0	
18.5 – 23	15	25	
23-25	15	25	
25-30	29	48.33	
>30	1	1.6	
TOTAL	60	100	

Table III shows that maximum cases were seen with BMI 25-30 (29) followed by 18.5- 23 (15) and 23-25 (15). The difference was significant ($P < 0.05$).

Table IV Assessment of parameters

Parameters	Variables	Number	P value
HTN history	Yes	14	0.04
	No	34	
Diabetes H/O	Yes	6	0.02
	No	42	
Smoking	Yes	21	0.94
	No	27	
Family history	Yes	8	0.01
	No	40	
Hypotension on O/A	Yes	1	0.01
	No	47	

Table IV shows that 14 patients with IWMI with RVMI gives a history of hypertension and 6 patients of IWMI associated with RVMI gives a history of diabetes, 21 patients give history of smoking, 8 family history and 1 hypotension. The difference was significant ($P < 0.05$).

Table V Association between bradycardia AND IWMI WITH RVMI

Pulse rate	IWMI+RVMI	IWMI-RVMI	P value
<60	7	3	0.04
>60	5	45	
TOTAL	12	48	

Table V shows that there is a significant association between bradycardia and IWMI with RVMI.

Table VI Association between CHB AND IWMI WITH RVMI

CHB	IWMI+RVMI	IWMI-RVMI
Yes	5	3

No	7	45
TOTAL	12	48

Table VI shows that there is a significant association between CHB and IWMI with RVMI.

Discussion

Information about right ventricular function can be applied in thrombolysis decision making when a relative contraindication is present.⁸ In fact, the findings of one study suggested that patients with inferior myocardial infarction receives no advantage from thrombolysis in the absence of right ventricular involvement.⁹ Interest in recognizing right ventricular infarction non-invasively has grown because of the therapeutic implications of distinguishing patients with right ventricular dysfunction from those without right ventricular dysfunction. Criteria are there for the diagnosis of IWMI but when strictly implementation of the criteria leads to the underestimation of the true incidence of right ventricular infarction.¹⁰ In patients with RVMI, the hospital death is high and major complications are greater. According to the Shock Trial Registry¹¹, even in the younger age, lower rate of anterior MI, and higher prevalence of single vessel coronary disease of Right Ventricle compared with Left Ventricle shock patients, and their similar benefit from revascularization, mortality is unexpectedly high in patients with mainly RV shock and similar to patients with LV shock.¹² The present study was conducted to assess risk factors for right ventricular infarction.

In present study, average age of 60 subjects was 58.33. Maximum number of subjects were in age group 40 to 60 (43%) followed by 60 to 80(41%). We found that IWMI + RVMI was seen in 11 male and 1 female. In the same study by Dokainish et al¹³, right ventricular contraction abnormalities was present in 11/22 patients (60%) with right ventricular myocardial infarction and only in 6/28 (20%) patients without right ventricular involvement and it had statistical significance with $p < 0.02$.

We observed that maximum cases were seen with BMI 25-30 (29) followed by 18.5- 23 (15) and 23-25 (15). We observed that 14 patients with IWMI with RVMI gives a history of hypertension and 6 patients of IWMI associated with RVMI gives a history of diabetes, 21 patients give history of smoking, 8 family history and 1 hypotension. Garcia-Fernandez et al¹⁴ measured right ventricular dimensions in right ventricular myocardial infarction and established that diastolic dimension greater than 8mm/m² is highly indicative of ischemic right ventricular dysfunction, provided that other causes of right ventricular dilatation, but the sensitivity of this findings is low, about 50%, the same is true for a RVDD/LVDD ratio greater than 0.63.

We found that there is a significant association between bradycardia and IWMI with RVMI. There is a significant association between CHB and IWMI with RVMI. Anna Vitoria et al¹⁵ in 2000 noted that all patients with RVI showed a right ventricular dilation (LVEDD 3.2 ± 1.3 cm) with increased right ventricular end diastolic and end systolic areas. The interventricular septum had an abnormal motion in 86% of the patients.

Conclusion

Authors found that there is significant association between smoking, hypotension, diabetes, CHB patients with IWMI with RVMI compared to patients without RVMI.

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