

A Study of right ventricular infarction in inferior wall myocardial infarction

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Abstract- Introduction: Ischemic heart disease is a common cause of morbidity and mortality worldwide. Acute inferior wall myocardial infarction accounts for 40% all acute myocardial infarctions. Right ventricular infarction is common in patients with acute inferior wall myocardial infarction.. **Objectives:** to study the incidence and clinical profile of right ventricular infarction and inferior wall myocardial infarction. **Materials and Methods:** Fifty cases of inferior wall infarction were included in the study. patients with history of previous infarction ,bundle branch block, cor-pulmonale and suspected pulmonary embolism were excluded. **Results:** Incidence of right ventricular infarction is about 40% in inferior wall myocardial infarction. Most patients presented with retrosternal chest pain associated with sweating. Raised JVP, hypotension, bradycardia. **Conclusions:** Incidence of right ventricular infarction in inferior wall infarction was fairly common. If diagnosis of right ventricular infarction done accurately and treated early prognosis is usually better.

Index Terms- myocardial infarction, inferior wall, right ventricle, coronary artery disease

I. INTRODUCTION

Coronary artery disease remains the major curse of mankind, inspite of a lot of developments in diagnosis, management and prevention. population surveys done in the last few decades indicate that the prevalence of coronary artery disease has increased atleast two folds in last twenty years in both urban and rural population in India. In urban adult population between 25 and 65 years of age, prevalence of CAD appears to be about 90/1000 people. CAD is less common in rural population compared to urban population(1).

Inferior wall myocardial infarction accounts for 40-50% of all acute myocardial infarctions and are generally viewed as having a better prognosis than Anterior wall MI. The mortality ranges from 2-9%. Nearly 50% of patients who suffer from inferior wall MI will have complications that will substantially alter an otherwise favorable prognosis.(2,3,4,5,6,7). Once considered rare and clinically unimportant, right ventricular infarction is now a recognized clinical event. Right ventricular infarction is seen in 25-52% of patients with inferior wall MI. It has been reported that RV infarction is also seen in 13% of patients with anterior wall MI. Isolated right ventricular infarction is found in less than 3% of cases. Clinical evidence have shown that RV infarction as a major negative prognostic factor in patients with inferior wall MI and its early recognition and proper treatment reduces the morbidity and mortality.(8,9,10). In the evaluation of patients with chest pain, the 12 lead ECG is sub optimal. Right ventricular infarction is

likely to be under diagnosed, because the standard lead placement does not allow these areas to assess directly. Additional frequency leads used include RV3, RV4, RV5 AND RV6 which reflect the status of right ventricle. The use of additional leads provide a more accurate reflection of the true extent of right ventricular damage(11).

II. OBJECTIVES

To study the incidence of right ventricular infarction in inferior wall MI. to study the clinical profile and influence of RV infarction on immediate prognosis of acute inferior wall MI.

III. MATERIAL AND METHODS

50 cases of acute inferior wall MI were included in the study.

Inclusion Criteria:1. Typical chest pain > 30 minutes and <24 hours, 2.ST segment elevation of more than or equal to 0.1 mV in 2 or more inferior leads

Exclusion criteria:

1. Previous history of myocardial infarction
2. Bundle branch block
3. Clinical evidence of cor-pulmonale
4. Patients with congenital heart disease with LVH
5. Suspected pulmonary embolism

Detailed history was taken in all patients and then 16 lead ECG consisting of 12 conventional leads and 4 right sided leads were recorded at the time of admission and every 24 hours thereafter during the hospital stay. RV infarction was diagnosed by ST segment elevation greater than or equal to 0.2mV in RV4 lead. Patients were monitored for any clinical changes and ECG changes. Patients were also subjected to other routine investigation like CBC, RBS, Lipid profile. Urea, creatinine, electrolytes, CK-MB, LDH. Troponin T , Echo and chest X-ray.

IV. RESULTS

Of the 50 patients. 30 had isolated inferior wall infarction and 20 patients had associated RV infarction(40%). Minimum age of the patient was 32 years and the maximum age was 78%. Maximum number of patients were in 51-70n years age group. The mean age was 55.66+/-33 years.. male patients were 40 and females were 10..70% were smokers 20n patients had hypertension and 11 patients had dyslipidaemia , 12 had diabetes mellitus and 5 had family history of ischemic heart disease. Most common presentation was chest pain(49 patients-98%)80% had associated sweating 245 had vomiting, 205 had breathlessness, 8% had palpitation and 2% had syncope. On clinical examination

40% had tachypnea, 32% had raised JVP, 28% had hypotension 28% had bradycardia, 20% had kussmaul's breathing and 18% had tachycardia. Incidence of atrial fibrillation was 4% , first degree AV block was 4% , 2nd degree AV block was 14% and complete heart block was 6%.

Hypotension was more common in Rv infarction(50%). Cardiogenic shock was seen in 10% of patients with RV infarction. Mortality rate was 15% in RV infarction and 3.33% in isolated inferior wall MI. totally 4 patients died during the treatment 3 from Rv infarction group and one from isolated inferior wall ML group.

Tables 1

Age in years	Isolated inferior wall infarction		RV infarction		Total	
	No	%	No	%	No	%
31-40	4	13.33	2	10	6	12
41-50	8	26.66	4	20	12	24
51-60	12	40	6	30	18	36
61-70	6	20	6	30	12	24
71-80	0	0	2	10	2	4
Total	11	100	20	100	50	100
Mean SD					55.66+/- 11.33	

Table showing the age distribution among the study subjects

Table 2

Risk factors	Isolated IWMI		RV infarction		Total	
	No	%	No	%	No	%
Smoking	20	66.66	15	75	35	70
Hypertension	12	40	8	40	20	40
Dyslipidaemia	6	20	5	25	11	22
Diabetes mellitus	7	23.33	5	25	12	24
Obesity	4	13.33	3	15	7	14
Family h/o IHD	3	10	2	10	5	10

Table 3

Physical signs	Isolated IWMI		RV infarction		Total	
	No	%	No	%	No	%
Tachypnea	10	33.33	10	50	20	40
RV s3/s4	1	13.33	9	45	10	20
Raised JVP	4	13.33	12	60	16	32
Hypotension	4	13.33	10	50	14	28
Bradycardia	4	13.33	10	50	14	28
Kussmaul's sign	0	0	10	50	10	20

Tachycardia	5	16.66	4	20	9	18
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Table showing various physical signs at the time of presentation

Table 4

Arrhythmias	Isolated IWMI		RV infarction		Total	
	No	%	No	%	No	%
Atrial fibrillation	2	6.66	0	0	2	4
First degree AV block	1	3.33	1	5	2	4
2 nd degree AV block	1	3.33	3	30	7	14
CHB	0	0	3	15	3	6
Ventricular fibrillation	1	3.33	0	0	1	2

Table showing various type of blocks and arrhythmias in study subjects

V. CONCLUSION

William Harvey was perhaps the first person to report postmortem findings correlated with clinical description in a patient with ischemic heart disease. In 1842 Marshal hall emphasized that experimental obstruction of coronary artery soon resulted in death. James B. Herric in 1912 described the clinical picture of obstruction of coronary arteries. In 1948 Wartman and Hallerstien described 22 cases of RV infarction out of 164 MI cases autopsied. The incidence of RV infarction is 40% in the present study.

There are several other studies which shows studied the incidence of RV infarction. Jha et al had done similar study in 1988 where the incidence of RV infarction was 37.5%. Approximately 19% of the patients with 2nd and third degree heart blocks develop complication in inferior wall MI.(2).20% of patients in this study had these high degree blocks in the present study. Studies shows that RV infarction is associated with increased complications and mortality rates. Zehender et al showed that early thrombolytic therapy reduces the mortality rates from 42% to 10%. After the acute episode, right ventricle shows remarkable capacity to improve in its function if the patient survive. The incidence of myocardial infarction was more in the patients in their fifties may because of increased atherosclerosis with advanced age. Adding to this natural phenomenon, is the cumulative effect of smoking and hypertension which also seen in the present study. To conclude RV infarction is associated with increased risk of mortality in Inferior wall MI.All cases of Inferior wall MI should have right sided chest leads record during ECG and should be done as early as possible. Studies also show that early recognition and proper treatment reduces the morbidity and mortality in both RV infarction as well as in isolated inferior wall MI.

VI. LIMITATIONS

Present study involved only 50 patients and there was no validation or proper documentation of true right ventricular infarction by means of nuclear scan imaging and contrast ventriculography. We relied on previous studies which had already validated ECG as a reliable indicator of myocardial infarction.

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