Clinical Study of Acute Inferior Wall Myocardial Infarction with Special Reference to Right Ventricular Infarction

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ABSTRACT *Background and Objectives:*

To study the clinical presentation of acute inferior wall myocardial infarction and also to study incidence, clinical features and prognosis of right ventricular infarction in inferior wall myocardial infarction.

Methods : Fifty consecutive cases of inferior wall infarction was included after

excluding patients with previous infarction, bundle branch block, clinical evidence of corpulmonale, pre-excitation syndrome and suspected pulmonary embolism. A detail history was taken in all the patients and through physical examination was done. A 16 lead ECG consisting 12 conventional leads and 4 right side chest leads was recorded at the time of admission and also as per need.

Results: Incidence of right ventricular infarction is about 40% in inferior wall myocardial infarction. Most of the patients (98%) presented with retrosternal chest pain associated with sweating. Raised jugular venous pressure (32%), hypotension (28%) bradycardia (28%) , Kussmaul's sign (20%) and RV S3/S4 were more common in patients with right ventricular infarction. Clinical complications were common in patients with right ventricular infarction (60%).

Interpretation and Conclusion: Incidence of right ventricular infarction in inferior wall infarction is fairly common. All cases of inferior wall infarction should have right sided chest leads recorded during ECG examination. If diagnosis of right ventricular infarction is correctly made and treated the prognosis is usually good.

Indroduction

Coronary artery disease (CAD) remains a major disease of mankind, even though a lot of developments in the diagnosis, management and prevention of risk factors have taken place. Population surveys carried out in the last few decades indicates that the prevalence of coronary artery disease has increased atleast two-fold in last twenty years, in both rural and urban population of India.

Inferior wall myocardial infarction (IWMI) account for 40 to 50% of all acute myocardial infarction and are generally viewed as having a more favorable prognosis than anterior wall infarction. The mortality rate in them ranges from 2 to 9%.[1,2]Once considered rare and clinically unimportant, infarction of the right ventricle is now recognised as a common clinical event. Right ventricular myocardial infarction is present in 25 to 52% of patients with inferior wall myocardial infarction. It has been reported that right ventricular myocardial infarction occurs in upto 13% of patients with anterior wall myocardial infarction. Isolated right ventricular myocardial infarction is found in less than 3% of cases.[3,4] Right ventricular myocardial infarction is characterised by a unique pathophysiologic profile and accompanying therapeutic implication. Clinical studies have identified right ventricle involvement as a major negative prognostic

indicator in patients with inferior wall myocardial infarction, and its proper recognition and treatment have assumed increasing importance.

Right ventricular myocardial infarction(RVMI) accompanying inferior myocardial infarction is associated with a significant higher mortality (25-30%).[5] Right ventricular myocardial infarction contributes markedly to hemodynamic instability, atrioventricular conduction block and in-hospital mortality in patients with inferior myocardial infarction.

AIM

To study occurrence of right ventricular infarction in acute inferior wall myocardial infarction and to study clinical features and influence of right ventricular infarction on immediate prognosis of acute inferior wall myocardial infarction.

MATERIALS AND METHODS

This was an observational study conducted in the medicine unit of a tertiary care hospital (M.E.S medical college, Perithalmanna)in south India over for a period of 12months. A total of 50 (M: F 40: 10) patients with acute coronary syndrome were studied during the period. Written informed consent was obtained from all the study subject. Patients with typical history of chest pain >30 min duration and ST segment elevation of more than or equal to 0.1 mV in 2 or more inferior leads (II, III, aVF) were included in the study. A detailed history was taken in all the patients and a thorough physical examination was done as per the proforma. A 16 lead ECG consisting of 12 conventional leads, 4 right side chest leads (V3R, V4R, V5R, V6R) was recorded at the time of admission and every 24 hour thereafter during hospital stay and also as per need. RVMI was diagnosed by ST segment elevation greater than or equal to 0.1mV in V4R lead. Patients were divided in to Group A(Patients with inferior wall myocardial infarction only) and Group B(Patients with inferior wall and right ventricular infarction only). . SPSS (Statistical Package for the Social Sciences**)** were used for data analysis. Chi-square test was applied to find the significance of difference between two proportions and a P value of less than 0.05 was considered

to be statistical significant.

Results

In the present study, right ventricular infarction was seen in 20 out of 50 patients with acute inferior wall myocardial infarction. In the present study, the minimum age of the patient was 32 years and maximumage was 78 years. The maximum number of patients were in between 51-70 years, constituting 60% (30). There was no significant difference between two groups.

In the present study, the sex distribution showed a clear male preponderance, that is, 80% (40) were males and 20% (10) were females. The male to female ratio was 4:1. Similar male preponderance was noticed in both groups.

In the present study, smoking was present in 70% (35) patients. Hypertension was present in 40% (20) patients. Dyslipidemia was present in 22% (11) patients, 24% (12) patients had diabetes mellitus, 14% (7) were obese and10% (5) patients had family history of ischemic heart disease. The risk factors were comparable between two groups.

In the present study, chest pain was the most common mode of presentation, present in 98% (49) patients. It was associated with sweating in 80% (40) patients.

Vomiting was present in 24% (12), breathlessness in 20% (10), palpitation in 8% (4) and syncope in 2 % (1). The symptoms were comparable between study groups.

In the present study, tachypnea was the commonest physical sign 40% (20), followed by raised jugular venous pressure 32% (16), hypotension 28% (14), bradycardia 28% (14), Kussmaul's sign 20% (10) RV S3/S4 20% (10) and tachycardia18%(9). RVS3/S4, raised jugular venous pressure, hypotension, bradycardia and Kussmaul's sign were more common in Group B. There was not much difference in tachycardia between two groups.

In the present study, incidence of atrial fibrillation was 4% (2), first degree AVBlock 4% (2), second degree AVB 14% (7), CHB 6% (3) and ventricular fibrillation 2% (1). Incidence of high degree AV Block (II 0 AVB and CHB) was 45% in group B compared to 3.33% in group A.

In the present study incidence of hypotension was 50% in group B compared to 3.33% in group A, that of RVF is 45% in group B compared to 0% in group A. Incidence cardiogenic shock is 10% in group B compared to 0% in group A. Mortality is more in group B (15%) compared to in group A (3.33%). Cardiogenic shock was cause of death in 2 patients in group B. one patient died of CHB in group B. In group A 1 patient died of ventricular fibrillation.

Discussion

In the present study, right ventricular infarction was seen in 40% (20) patients. The present study is similar to the study by most authors. Study by Jha et al(4), Zehender et al(2) and Yue et al(6) showed an incidence rate of 37.5%, 54% and 38% respectively.

In the present study, the mean age of the patient is 55.66 years. Inferior wall infarction with or without right ventricular infarction is seen in middle aged individuals. This may be because with the advancement of age atherosclerosis is also likely to increase. Adding to this natural phenomenon, is the cumulative effect of smoking and development of hypertension. The present study is similar to the study by other authors. Mean age of patients in a study by Croft et al(7) was 55.8 ± 9.8 year.

In the present study, there is a male preponderance, ratio being 4:1. There is similar male preponderance in different study groups.In a study conducted by Bueno et al(8) showed a male female ratio of 4.5: 1. Beyond the age of 55 years, the incidence of myocardial infarction in both males and females is approximately equal, but in the present study, there is a male preponderance. This may be because of occurrence of other risk factors like smoking, which is more common in males. This may also be because of small sample studied. The present study is similar to the study by other authors.

Smoking was the single most common risk factor in this study constituting 70% of patients with acute inferior wall infarction. Meher et al [9]reported the incidence of smoking in 50% of patients as a risk factor in acute myocardial infarction. Bueno et al [8] (63%), Yoshino et al [10] (71%), Shiraki et al[11](63%) and Khan et al.[12](64%) reported smoking as the most common risk factor. The present study is similar to the study by other authors.

In this study 40% of patients had hypertension. Meher et al.[9] reported its incidence as 27.4%, Bueno et al.[8] as 39% Yoshino et al[10] as 61%, Shiraki et al [11] 49.4% and Khan et al. [12] as 39.89%. The present study is similar to the above studies.

Twenty-two (24%) percent of the patients were found to have diabetes mellitus in the present study. The occurrence of diabetes mellitus in other studies like Bueno et al.[8] was 23% Yoshino et al [10] 28% and Khan et al[12] 21.84% which are comparable with the present study.

Twenty-two (22%) percent of the patients had dyslipidemia in this study. Bueno et al.[8] reported its occurrence as 31%, Yoshino et al. [10]as 29% and Khan et al. [12] 20.39%. The present study is similar to above studies.

Ten (10%) percent of the patients had family history of IHD in this study. Khan et al [12] reported its occurrence as 9.17%. The present study is comparable to this study.

There was no significant difference in the two groups in presenting symptoms. Among the physical findings during the time of admission, hypotension was a significant finding in group B (50%) than in group A (6.66%) which was next to elevated JVP which was around 60% in group B and only 13.33% in group A. Kussmaul's sign was observed in 10 (50%) patients in group B but none had Kussumaul sign in group A.

This was comparable with study done by Sinha N et al [13] which shows an incidence of 65% raised JVP and 40% hypotension and can also be compared with the study by JHA et al in [4] (33.3%).

The incidence of complications in group B was more 60% compared to in group A 13.33% , among them high degree AV block was the commonest complication 45%. The incidence of high degree AV block was reported by Brat et al[14] in 1984. Cardiogenic shock was observed in 2 of 20 patients in group B in the present study 8YY'with percentage of 10% which can be compared to the study done by Shah et al [15] in whose incidence was 9%.

We conclude that Incidence of right ventricular infarction in inferior wall infarction is fairly common. All cases of inferior wall infarction should have right sided chest leads recorded during ECG examination. If diagnosis of right ventricular infarction is correctly made and treated the prognosis is usually good.

Figure 1- Showing Incidence of Right ventricular infarction in inferior wall infarction
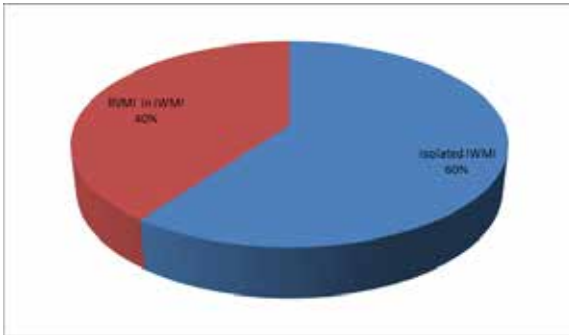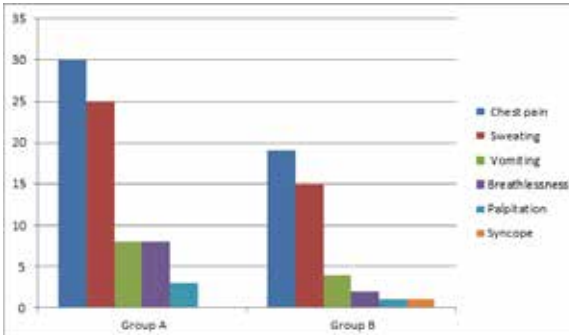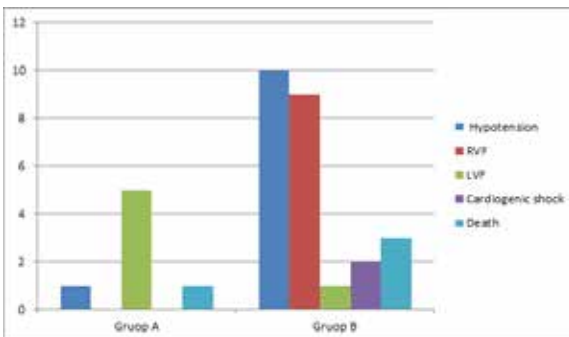

Figure Showing the symptoms at the time of presentation

Showing Clinical Complications

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