

A Study of ST Elevated Myocardial Infarction in Female in a Medical College Hospital of Kolkata

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Abstract: Objective: The aim of this study was to find out the risk factors, complications during stay in hospital and to evaluate the outcome of ST elevated myocardial infarction (STEMI) in female during hospital stay and follow up period of six months in comparison to male.

Background: This type of study has not been conducted in Eastern India in recent past.

Methods : This single blind prospective study was conducted in the Department of Cardiology, NRS Medical College, Kolkata on 50 female and 50 male patients of STEMI over 18 months. All patients after being rigorously selected underwent pre-specified clinical examination, biochemical evaluation, Electrocardiography, Echocardiography as well as Coronary angiography and studied for in-hospital and follow up complications over six months. Data evaluated, analyzed and compared to male STEMI patients using Student t Test and Chi square test.

Results: Maximum incidence of female STEMI was one decade later to male STEMI patients. Association of hypertension, low HDL and high triglycerides were significantly more with female STEMI patients. During hospital stay mortality rate was 18% and 8% in female and male STEMI patients respectively. In 6 month follow up mortality rate and rate of re-infarction in female STEMI patients were 16% and 18 % respectively where as both the parameters were 8% in male STEMI patients.

Conclusion: Female STEMI patients were older than the male patients. Hypertension, Diabetes Mellitus, hypothyroidism, obesity, low HDL and high Triglycerides were more frequently associated with female STEMI whereas smoking, high LDL and anterior wall myocardial infarction were more prevalent in male STEMI patients. But female patients suffered from more in-hospital and follow up complications with higher mortality.

Keywords: STEMI, Female, LAD, Hypertension, HDL, LDL, Hypothyroid, Smoking, OCP, In-hospital complication, Mortality.

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I. Introduction

The spectrum of cardiovascular disease in female differs in the occurrence, presentation and course of the disease and in some cases, in treatment and response to therapy. Cardiovascular disease is the leading cause of death among women, regardless of race and ethnicity. Due to ageing of population, the number of women suffering from coronary artery disease is increasing day by day but women are less diagnosed and under treated for coronary artery disease.

This study was designed to find out the risk factors and in-hospital complications of ST elevated myocardial infarction in women and to compare with those in men. Another important objective of this study was to evaluate the outcome of ST elevated myocardial infarction in females during hospital stay and follow up period of six months and to compare those with male patients.

II. Materials And Methods

This single blind prospective study was conducted in the Department of Cardiology, NRS Medical College and Hospital, Kolkata on 50 female and 50 male patients of ST elevated myocardial infarction (STEMI) over a period of 18 months. Women with unstable angina/non STEMI or old infarction were excluded in the study. For comparative analysis with male, age matched subjects with STEMI were included in this study. Diagnosis of STEMI was done according to World Health Organization and American Heart Association. Baseline evaluation was done on each patient regarding age, sex, family history, smoking habits, history of oral contraceptive pill intake, BMI. All patients underwent 12 lead electrocardiogram, complete haemogram, blood sugar (fasting and post prandial), urea, creatinine, cardiac enzymes, lipid profile, echocardiography (M – Mode, 2D, Doppler), Coronary angiography. The case records were analysed, studied and compared by relevant statistical methods.

III. Results And Analysis

Characteristic	Female (n=50)	Male (n=50)	P-value
Age in years (Mean + S.D)	58.42 + 8.82	55.32+10.48	0.056
Age categories [%]			
40-49 years	4 (8%)	18 (36%)	
50-59 years	27 (54%)	16 (32%)	
60-69 years	14 (28%)	10 (20%)	
> 70 years	5 (10%)	6 (12%)	
Hypertension (> 140/90)	36 (72%)	26 (52%)	0.039
Diabetes mellitus (Fasting blood Sugar >126 mg/dl post prandial blood sugar >200 mg/dl)	36 (72%)	29(58%)	0.142
Hypothyroidism (TSH>10 µIU/ml)	8 (16%)	2 (4%)	0.046
Smoking	3 (6%)	30 (60%)	0.000
Obesity (BMI>30 kg/m2)	18 (36%)	8 (16%)	0.023
Low HDL (female < 40mg/dl, Male ,<50mg/dl)	31 (62%)	21 (42%)	0.045
High LDL (>160mg/dl)	16 (32%)	31(62%)	0.003
High triglycerides level (>150mg/dl)	37(74%)	25 (50%)	0.013

Table1: Base Line parameters

Maximum incidence of STEMI in female occurred in between 50-59 years of age. Where as in case male it was one decade (40-49 years) earlier than that of the female. Above 70 years, the occurrence of STEMI was almost similar in both genders. Female STEMI patients were commonly associated with hypertension (72% versus 52%) and it was statistically significant in our study. Female patients were commonly associated with diabetes mellitus than their male counterpart (72% versus 58%). There was female preponderance in hypothyroidism (female 16% versus male 4%). Male STEMI patients were commonly associated with smoking. In our study, obesity was more prevalent in female than male (36% versus 16%). In our study female STEMI patients were commonly associated with low HDL and high triglyceride level, whereas increased LDL level was commonly associated with male group, and this was statistically significant. None of our patients was on OCP. Thirty two female and thirty six male patients received thrombolysis. All the patients had undergone coronary angiography.

Male patients had outnumbered female counter part in respect to anterior wall myocardial infarction.

Characteristic (Distribution of AMI)	Female	Male
Inferior wall MI	20(40%)	15 (30%)
Anterior wall MI	30 (60%)	35 (70%)

Table 2 : Distribution of AMI

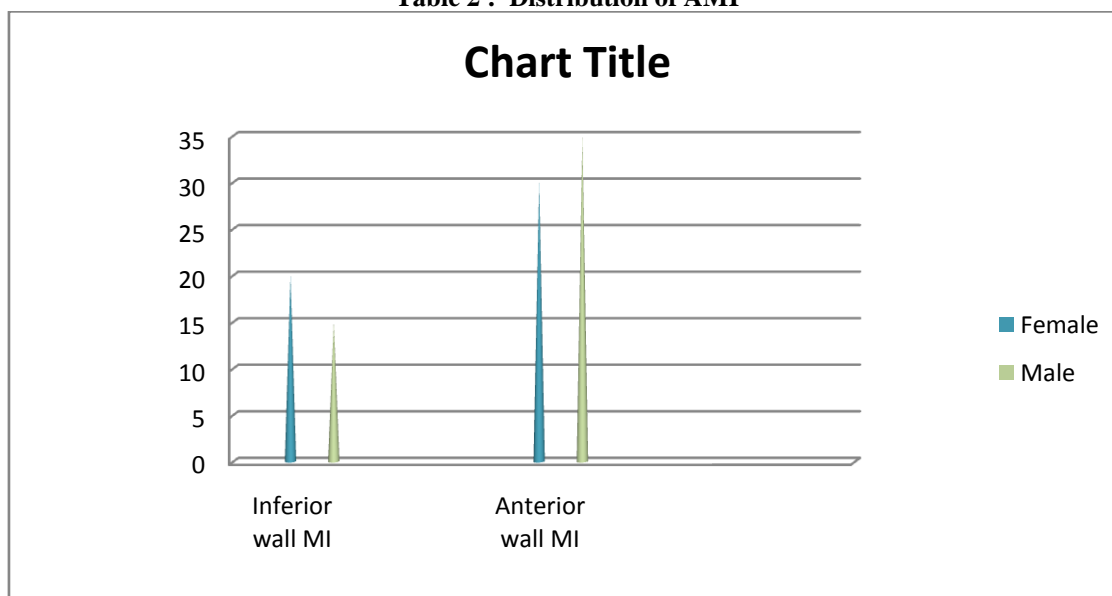


Fig 1: Distribution of STEMI with respect to gender

There was a similarity that diabetic patients were commonly associated with triple vessel disease irrespective of gender. Male AMI patients were commonly associated with LAD disease in comparison to female AMI group and it was statistically significant.

Distribution of AMI

Involved artery	Female (n=50)	Male (n=50)	P-value
Right coronary artery	12 (24%)	8 (16%)	0.202
Left circumflex artery	8 (16%)	6 (12%)	0.564
Left anterior descending artery	14 (28%)	20 (40%)	0.205
Double vessel disease	10 (20%)	4 (8%)	0.084
Triple vessel disease	6 (12%)	12 (24%)	0.118

Table 3 : Coronary Artery Involvement

Thirty female and thirty five male patients underwent pharmaco-invasive therapy. Percutaneous transluminal coronary angioplasty and stenting were done within 24 hours after thrombolysis. All the patients were thoroughly examined and their outcomes were noted during hospital stay (10±2 days). All the patients were advised to follow up monthly for 6 months. Their relatives were also instructed to communicate with us for any untoward event. Complications occurred more frequently in female and mortality rate appeared to be high in female in comparison to male STEMI patients.

Characteristic	Female (n=50)	Male (n=50)
Congestive cardiac failure	9 (18%)	5 (10%)
Cardiogenic shock	5 (10%)	3 (6%)
Complete heart block	4 (8%)	3 (6%)
Ventricular fibrillation	3 (6%)	2 (4%)
Ventricular tachycardia	4 (8%)	3 (6%)
Hemorrhagic complication	5 (10%)	2 (4%)
In hospital mortality	9 (18%)	4 (8%)

Table 4 : Outcome of AMI patients (during hospital stay)

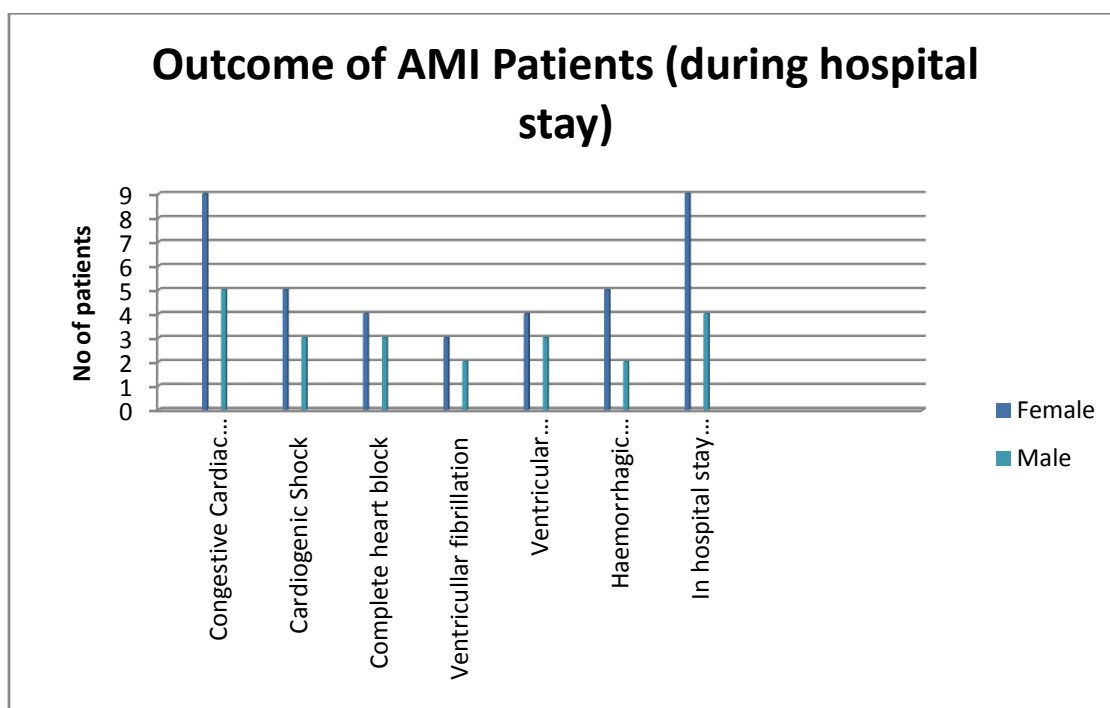


Fig 2: Outcome of in- hospital STEMI patients

Characteristic	Female (n=50)	Male (n=50)
Mortality	8 (16%)	4 (8%)
Reinfarction	6 (12%)	4 (8%)

Table 5: 6 months follow up

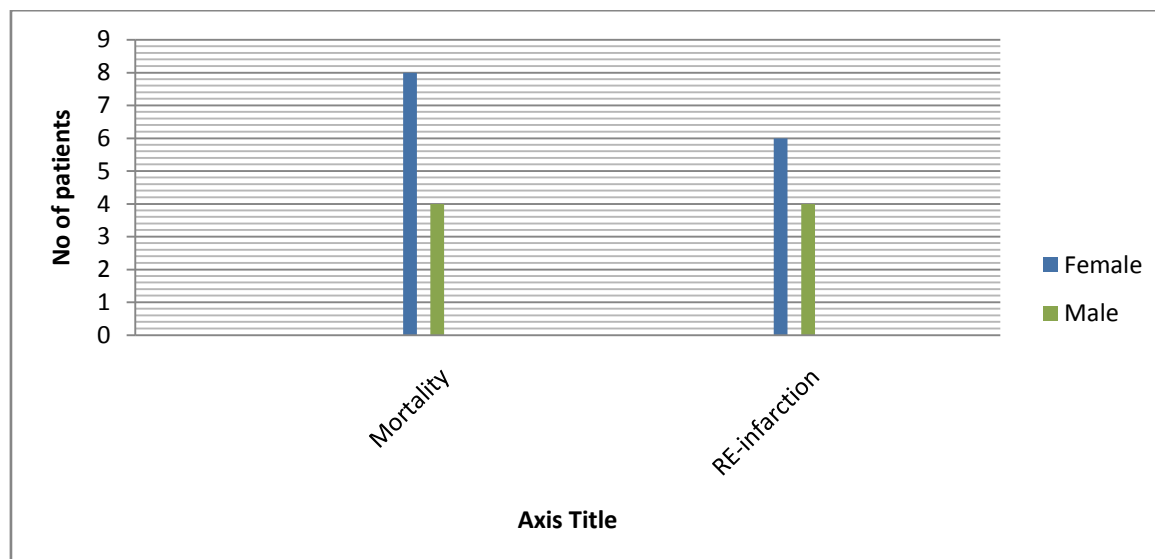


Fig3: Gender based 6 month follow-up outcome of STEMI patients

IV. Discussion

In the present study, the mean age of occurrence of STEMI in women was 58.42±8.82 years and in men 55.32 ±10.48 years respectively. The findings are corroborated with the study of Lincoff et al [1]. In the study of Dettrich et al [2], females are relatively older compared to our study, the mean age of female being 69 ±11 years. Hypertension is one of the important risk factors of STEMI in both male and female. But the association of hypertension was significantly higher (female 72% versus male 52%) in women in our study which is against the Framingham data showing more male association with hypertension and CAD [3]. We observed that incidence of diabetes in male and female patients were 72% and 58% respectively. Bueno et al [4], reported that 41% elderly female and 18% elderly male patients were diabetic in their study. Another study of Ramesh BB et al [5], showed that the incidence of diabetes was 40.8% in elderly female AMI patients. Diabetes women also have higher in hospital mortality after AMI and an increased incidence of congestive heart failure than do diabetic men [6]. Like the study of Wilkinson et al [7] in our study also male patients outnumbered (male 60% versus female 3% female counterpart in smoking. Ramesh BB et al [5], in their study reported 8.8% women with AMI were obese. However, the incidence of obesity was considered higher in female STEMI patients in comparison to male (female 36% versus 16% male) in our observation. There are sex differences in lipoprotein profiles and the impact of lipids on cardiovascular risk [8]. 31 female STEMI patients (62%) have low HDL and 37 (74%) had high triglycerides level. In this study post menopausal patients were mainly associated with such lipid abnormalities. A study by Philip Greenland and Israeli Sprint investigation [9] showed higher in hospital mortality and 1 year mortality in women than men. Study of Howard Dittrich et al [10] also revealed similar data. In our study nine female STEMI patients (18%) have congestive cardiac failure during hospital stay. Result of Weaver et al [11] is in close agreement with our observation. Bueno et al [4] showed that 53% elderly women with AMI developed congestive cardiac failure. Five female STEMI patients (10%) developed cardiogenic shock. This closely corroborates with findings by Weaver et al [11]. Four (8%) out of fifty AMI suffered from ventricular tachycardia during hospital stay (10±2 days), which is comparable to the study by Bueno et al [4]. Six percent female in our study developed ventricular fibrillation which corroborates with the study by Bueno et al [4]. We observed no single incidence of major bleeding. Only five (10%) female had minor bleeding episodes in the form of gum bleeding. Lincoff et al [1] showed that 2% female had haemorrhagic stroke. Out of 50 female AMI patients, nine patients (18%) died during hospital stay (10 + days). Wilkinson et al [7] found 10 days mortality to be 19.5% in female AMI group. During the period of 6 months follow up, eight female (16%) and four male (8%) patients died. Re-infarction developed six female (12%) and four male (8%) patients.

V. Summary And Conclusion

Patients of female STEMI were found to be older than male. The difference in age was found to be significant. Association of hypertension, Obesity, Diabetes, Mellitus were significantly higher in women in our study. On the other hand, men were found to be more frequent smokers than women. Female STEMI patients were commonly associated with low HDL and high triglyceride level, where as increased LDL level is commonly associated with male group and was found to be statistically significant. Regarding in hospital events of STEMI, Congestive heart failure, ventricular tachycardia, ventricular fibrillation, cardiogenic shock,

complete heart block, and haemorrhagic complication were more frequently encountered with women. Subsequently when the outcome was compared during 6 months by noting all the causes of mortality and re-infarction, females were found to have unfavorable prognosis compared to male.

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