A Hospital Study of Clinical Profile, Risk Factors and Outcome of Acute Myocardial Infarction In Females

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Abstract
Introduction: *Coronary heart Disease (CHD) considered to be man's disease, is also a leading cause of mortality and morbidity in middle aged women throughout world. Coronary manifestations occurs approximately 20 years later in women as compared to men and may have atypical presentations. The poor prognosis in women due CHD has been attributed to advanced age, concomitant medical illnesses, late presentation because of atypical presentations, ignorance of seriousness of the disease and delayed treatment.*
Materials and Methods: *80 consecutive female patients admitted in the Department of Medicine(Cardiology) at Govt. Villupuram medical college from 1st June 2017 to 31st May 2018 were included in the study. Informed consent, demographic profile and risk factors were recorded. After focused clinical examination biochemical investigations such as RBS, Hb A1C, Lipid profile, 12 lead electrocardiogram and echocardiography etc. was done.* ***Results:*** *Total 80 patients included in the study had mean age of 62.4 ± 13.6 years. The majority of females between the age of 61-70 years constituted 50% 0f study population. Dyslipidemia was the commonest risk factor followed by obesity, smoking, hypertension and diabetes. Chest pain was the common presenting feature with atypical pain chest in 25% of females.* ***Conclusion:*** *CHD is an under diagnosed undertreated and under researched disease in women for various reasons and it is more age dependent in women than in men. The primary care physicians, paramedics posted in peripheral institutes should be appraised about the clinical profile, risk factors of CHD in females so that effective therapy can be instituted in time to decrease subsequent morbidity and mortality.*
Key Words: *CHD, Women, Mortality.*

I. Introduction

Coronary heart disease (CHD) is perceived to be of greater importance in men and is largely considered to be a man's disease. It is also the leading cause of Mortality and morbidity in middle aged women in developed and developing countries. Women constitute about 48% of the total population in India; however due to inadequate perception and attention CHD also remains a formidable health problem of women in India and it is rightly said that CHD is under diagnosed, undertreated and under researched disease in women for various reasons.[1] Before menopause the incidence of CHD is significantly lower and is attributed to effects of estrogens. Coronary manifestations usually appears 10 years later in women as compared to men and myocardial infarction (MI) occurs approximately 20 years later.[2] Risk of coronary artery disease (CAD) is identical to men at the age of 80 years.

There is a strong positive correlation between the presence of risk factors and incidence of acute myocardial infarction (AMI) in women. Hospital mortality from MI is higher in women than in men, a recent study showed hospital mortality of 16.7% for women and 11.5% in men.[2] The poor prognosis as also been attributed to advanced age and concomitant medical illnesses, late presentation because of delayed treatment. Therefore this study was designed to determine the clinical profile and risk factor of female patients admitted with an AMI, reason for the delay in receiving thrombolytic therapy, short - term outcome during hospital stay and within 1 month.

II. Materials And Methods

The study population included all consecutive female patients of acute coronary syndrome (ACS) admitted in the Department of Medicine (Cardiology) at Govt. Villupuram Medical College and Hospital, Villupuram over a period of 1 year (1st June 2017 to 31st May 2018). This is a hospital based study included 80 patients admitted with both ST and Non-ST elevated Myocardial infarction (STEMI and NSTEMI). Demographic profile of the patients was recorded which included age, place of residence i.e. rural/urban, history of smoking, diabetes, hypertension, dyslipidemia, prior CAD, family history of CAD and use oral contraceptive

pills was recorded. Focused examination was carried out to record blood pressure (BP), heart rate, waist circumference and sign of heart failure.

Details of biochemical investigations, random blood sugar (RBS) lipid profile and glycated haemoglobin (Hb A I C) in selected patients done within 24 hrs were recorded. 12 lead electrocardiogram (EKG) was recorded in each patient at admission. Right precordial EKG was done in patients with inferior wall MI (IWMI). Heart rate, rhythm, ST segment; T wave changes, Q waves, conduction disturbances and arrhythmia were recorded. Indication for reperfusion therapy was recorded and if patient did not receive reperfusion therapy reasons for the same were recorded.

Patients receiving reperfusion therapy door to needle time was recorded; repeat EKG recorded at 90 min to look for success of reperfusion therapy. Pre- specified hospital outcome such as reinfarction, heart failure, arrhythmias, stroke, pulmonary thromboembolism (PTE), duration of hospital stay, death and outcome after 1 month in the form of readmission for reinfarction, heart failure and stroke etc. was recorded. Patient were contacted on telephone who didn't come for follow up after 1 month of hospital discharge and reason for not coming for follow-up or Death was recorded. The standard specified definition of STEMI, NSTEMI as well pre specified definition of typical and typical pain chest were used and recorded accordingly.

The EKG criteria to define AWMI, Ant septal MI, lateral wall MI, IWMI, right ventricular MI and posterior wall MI were used. The Framingham criteria for Heart Failure were used to diagnose Heart Failure in these patients. Risk stratification was done according to thrombolysis in myocardial infarction (TIMI) risk score to stratify these patients into low, intermediate and high risk

Risk factors

Cigarette smoking; Smokers were defined as those who had ever smoked more than 100 cigarettes or beedis - in their- life time or had smoked at least one cigarette/beedi-per day for last 3 months. Ex- smokers were defined as those who had not smoked even a single beedi/cigarette for last 3 months but had smoked more than 100 cigarette/beedis in the past. Obesity; visceral obesity was defined according to international diabetes federation criteria as waist circumference ≥–80 cm in women. Hypertension was defined as known hypertensive or systolic BP (SBP)≥–140 and or diastolic BP (DBP) ≥–90 mm Hg.

Dyslipidemia was defined as the presence of any of the following: Patients on lipid lowering drugs or Total cholesterol >240 mg/dl, triglycerides (TG) >150 mg/dl, low- density lipoprotein(LDL)> 130 mg/dl, and high-density lipoproteins (HDL) <50 mg/dl. Diabetes was defined as fasting blood sugar ≥126 mg/dl 2 hours post prandial blood sugar ≥200 mg/dl or HbA1C of >6.5%. Echocardiography was done using ATL_HDI-3000_echo_machinefrom parasternal and apical windows. M-mode and 2D examination was done. Wall motion abnormalities, left ventricular ejection fraction (LVEF) and presence of mitral regurgitation were recorded. GUSTO III Criteria for successful thrombolysis were used to look for poor, moderate and good response to thrombolytic agent. Statistical analysis Data collected was managed on a Microsoft excel spreadsheet. Chi-square test was used to compare discrete variables. All analysis was performed with the Epi-info version 3.5.1.

OBSERVATIONS
Demographic data
Age distribution:
The mean age of the patients in the study was 62.4 ± 13.6 years, (38-86 years). 15 (18.75%) were ≤50 years of age 25 (31.25%) between 61 and 70 years and 13 (16.25%) were >70 years. Most of the females in the study were in the age group of 61-70 years.

Risk factors
Among the study population about 6 (7.5%) had a history of smoking (current and past) and 6 (7.5%) were ex-smokers, 68 (85%) had never smoked (Table 1). Diabetes mellitus 16 (20.0%) were known diabetic. The mean RBS was 115 .62 ± 61.92. mg/dl. Hypertension 24 (30.0%) were known hypertensive. 53.57% of known hypertensive patients had blood pressure in the normotensive range.

The family history of premature CAD was seen in 9 (11.25%) patients. Central obesity was present in 28 (35.5%) of patients. The mean waist circumference was 84. 62 ± 9.14cm. 48 (66.66%) had dyslipidemia, while 24 (33.33%) had normal lipid level. Lipid profile could not be done in eight patients, 9(11.25%) of the patients were on lipid lowering drugs and among nine patients two had lipids in normal range the mean cholesterol level was 173. 45 ± 34.16 mg/dl. The mean total TG level was 131. 68 ± 21.15 mg/dl, mean HDL cholesterol (HDL-C) level was 44. 47 ± 7.43 mg/dl and the mean LDL cholesterol (LDL-C) was 101. 26 ± 23.42 mg/dl.

CLINICAL PRESENTATIONS

Among the study population 60 (75%) had typical chest pain at presentation 15 (18.75%) had atypical pain chest and 5 (6.25%) were pain free. Shortness of breath (SOB) was present in 30 (37.5%) of patients 20 (25.0%) had nausea and or vomiting. Associated sweating was present in 11 (13.75%) of patients presyncope and syncope was present in 7 (8.75%) and 2 (2.25%) of patients respectively.

Palpitation was presenting 14 (17.5%) of the patients. The mean heart rate was 83,9 ±16.53 beats/min. with a range of 32-158 bpm. The mean SBP was 116. 08 ± 22.47 (range: 60-168) and DBP was 73.22 ±14.41 mm Hg (24-110).

Among patients with STEMI signs of Heart failure were present in 24 (30.0%), and among non - STEMI heart failure was present in 4 (5.0%).19 (44.14%) patients in STEMI group were in Killip class I, 13 (30.23% in Killip classsII,4 (9.3%) in Killip class III and 7 (16.27%) in Killip classIV. In non-STEMI($n = 37$) 21 (56.75%) had TIMI low risk 14 (37.83%) intermediate risk score and 2 (5.40%) had TIMI high risk score.

Among the study population 43 (53.75%) had STEMI and 37(46.25%) had NTEMI. Among STEMI 27.5% had anterior wall myocardial infarction (AWMI), 12.5% had IWMI, 11.25% had IWMI with right ventricle myocardial infarction (RVMI) and 1.25% had anteroseptal myocardial infarction, 1.25% had AWMI with IWMI. 7 (8.75%) had rhythm disturbances. 4 had atrial fibrillation and 3 had ventricular tachycardia (VT), 14 (17.51%) had atrioventricular conduction defects, 3 (3.75%) had 1st degree heart block 5 (6.25%) had complete heart block. The right bundle branch block (RBBB) was seen in 2 (2.5%)of patients and 3 (3.75%) had left bundle branch block (LBBB). RBBB with 1st degree heart block was seen in 1 (1.25%) of patients. Echocardiography was done in 70 patients. Regional wall motion abnormalities was found in 55 (78.57%) of patients.

The mean LVEF was 49.07 ± 8.16%. 9 (12.85%) patients had mitral regurgitation. 16 (22.85%) had LVEF ≤40%, 14 (32.55%) patients with STEMI received reperfusion therapy with streptokinase. Two patients had contraindication to thrombolytic therapy. Late presentation was the main reason of not thrombolyzing these patients and the mean door to needle time was 36.64 ± 11.44 minutes with a range of 20-60 min.

The mean duration of stay was 5.01 ± 2.16 days. The in hospital mortality rate was 13.75% (11 patients). Cardiogenic shock was most common cause of death (five patients) followed by sudden cardiac arrest in three patients and ventricular fibrillation in one patient. 2 (2.5%) patients had reinfarction. After 1 month most of the patients remained stable 57 (82.60%). Three patients had reinfarction and 5 (5.79%) patients died.

III. Discussion

In the present study the demographic profile of the study population revealed the mean age 62.4 ± 13.6 years, which is comparable to other studies conducted in India, however western studies has reported mean age higher as compared to other studies conducted in India such as study by Hochmann et al.[3] Evaluation of the frequency of cardiovascular risk factors in the study population revealed that dyslipidemia was the commonest risk factor (66.66%). Low HDL-C was the most common abnormality found in this study i.e., 65.71%.

The frequency of patients with TG and LDL-C in the dyslipidemic range was 11.42% and 12.85% respectively. Dyslipidemia as a risk factor was higher when compared with the finding of Hochmann et al. found in 58.3% patients with angiographic CAD had obesity. Memon and Samad[5] found 10% and Oomman et al.[6] found that 41% of women with CAD were obese so prevalence of obesity was variable in different studies. Central/ Abdominal obesity is generally regarded as a more important predictor of ischemic heart disease than generalized obesity.

As there is a rise in prevalence of hypertension in female patients with CAD in this study hypertension was present in 30.0% patients and 62% hypertensive were on treatment where as 57% among them were controlled. The presence of hypertension was low as compared to other studies. The presence of diabetes was comparable, i.e., 23.75% to other studies like Hochmann et al. (22% among both NSTEMI and STEMI), Pinto et al. i.e., 24%. Chest pain was common presenting feature in 93.75% of patients with atypical pain chest was present in 25% and no chest pain in 6.25%. The frequency of heart failure was 28 (35%) in this study which is comparable to study by Weaver et al.[4] and Chang et al. i.e. 22%and 25.3% respectively.

Table 1 : Frequency of risk factors in the study population	
Risk factors	Frequency (%)
Smokinf Status	
Current smoker	6 (7.50)
Ex-smokers	6 (7.50)
Never smoked	68 (85.00)
Diabetes	
yes	16 (20.00)
Visceral obesity	
Yes	24 (30.00)
Hypertension	
Yes	24 (30.00)
Dyslipidemia	
Yes	48 (66.66)
Established CAD	
Yes	7 (8.75)
Family H/O CAD	
Yes	9 (11.25)

The STEMI was present in 53.75% and NSTEMI in 46.25% of female patients in this study and is similar to study conducted by Parveen *et al.*[7] thus in India women are more likely to have STEMI than NSTEMI which is in contrast to western population where NSTEMI is high as is observed in GRACE Registry (40% vs 60%).

Among patients with STEMI most common location of infract was AWMI (51.16%) followed by IW MI 23.25%. Jose and Gupta[8] has reported AWMI in 57%, IWMI in 39.1% and a study by Kumar *et al.* [9] most common type of MI in women was AWMI. In this study, out of 43 female patients with STEMI 32.55% were given thrombolytic therapy. Large majority of patients (67.45%) were not eligible for the thrombolytic therapy due to late presentation. The rate of use of thrombolytic therapy by Jose and Gupta[8] was 82.8%.

The reason for less use of thrombolytic therapy in this study was due to the relatively longer pre-hospital delay making them ineligible for the thrombolysis. The in hospital out come in female patients in our study was a stroke in 2.5%, heart failure in 35% reinfarction in 2.5% and mortality in 13.75%. The in hospital mortality among patients with STEMI was 23.25% versus 2.70% in NSTEMI.

IV. Conclusion

In our study the analysis of the demographic profile in female patients revealed that the mean age of the presentation was higher as compared to other Indian studies. A large majority of the patients were from rural areas. The analysis of the risk factors in this study showed that Dyslipidemia was the most common risk factor low HDL-C was the most common abnormality) followed by obesity, smoking, hypertension and diabetes. The frequency of smoking and Dyslipidemia among females in this study was relatively high. The presence of Hypertension was low and the Diabetes was comparable to other studies as also various other risk factors.

The clinical profile and pattern of AMI in females was comparable to other studies. Chest pain was the most common presenting complaint. AWMI was the most type. killip class > I and TIMI intermediate and high risk at presentation was seen in elderly patients. The in hospital mortality in our study was 13.75% and 5.79% within 1 month respectively it was more in elderly and significantly high in STEMI patients and was also in diabetic patients. It is concluded from this study that primary care physicians, paramedic posted in peripheral institutes should be appraised about the clinical profile of ACS in females and trained in the management of ACS including institution of thrombolytic therapy.

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