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Myocardial Infarction in "Women": Clinical Profile and Risk Factors

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Abstract

Background and Objectives: The risk of cardiovascular disease (CVD) in women has been historically underestimated due to a misperception that females are protected against CVD. There are limited studies of the risk factors and clinical characteristics of female patients presenting with myocardial infarction (MI) in India. To study clinical profile of female patient with MI in India. *Methods:* We enrolled a cohort of 180 female patients presenting with acute MI between June 2016 to May 2018. *Results:* The female MI patients were more likely to be dyslipidemic (46.11%), hypertensive (42.22%), obese (40.00%) with high mean BMI (32.05±6.42 kg/m2) and more likely to present with chest pain (83.33%) with STEMI (58.33%) compare to NSTEMI (41.66%). *Conclusion:* Indian female patients with acute myocardial infarction present at younger age as compared to western women, with chest pain and STEMI is more frequent presentation. Dyslipidemia was the most common associated risk factor followed by hypertension, obesity, and diabetes. *Study Design:* Cohort Study.

Keywords: Myocardial Infarction; Clinical Profile & Risk factors.

Introduction

The risk of cardiovascular disease (CVD) in women has been historically underestimated due to a misperception that females are protected against

CVD [1] and the description of symptoms associated with MI was based on the presentation characteristics of men. Women's symptoms of MI are often labeled as "atypical and different from the "classic" MI symptoms noted in men [2,3] and include a constellation of associated symptoms, usually without chest pain or discomfort [4-7].

Nowadays it is known that CVD is the No 1 killer of women in the United States and worldwide. According to WHO data from 2004, CVD is responsible for 43% of deaths in men and 55% of deaths in women [8]. The worldwide INTERHEART Study, a large cohort study of more than 52000 individual with myocardial infarction, have revealed that women have their first presentation of coronary heart disease approximately 10 years later than men, most commonly after menopause. Despite this delay in onset, mortality is increasing more rapidly amongst women than men [9]. The US Center for Disease Control and Prevention Report attributes 38% of deaths in women to coronary artery disease, compared with only 22% to cancer [10]. Despite the burden of heart disease in women, many lay persons do not recognize heart disease as an important health issue for women. Women are still under-represented in clinical trials. With this background, we studied the clinical profile and risk factor of female patients presented with an acute myocardial infarction in India.

Materials and Methods

Study Population

The study population included 180 female patients with ST and Non-ST elevation Myocardial infarction (STEMI and NSTEMI) from June 2016 to May 2018. We excluded patients with a diagnosis of unstable angina. Participation was voluntary, and informed written consent was taken.

Data Collection

Demographic profile and clinical history of the study patients was recorded.

Detail clinical examination, 12 lead electro-cardiogram (EKG), biochemical investigations, random blood sugar (RBS), fasting glucose, lipid profile and glycated haemoglobin (HbA_1C) were carried out. Myocardial infarction was defined according to the third universal definition of myocardial infarction [11]. chest pain location was classified as follows: 1) typical for retrosternal, precordial, right thoracic or bilateral thoracic pain (chestpain); 2) atypical for epigastric pain or located in the back, left arm or shoulder, right arm or shoulder, neck or jaw. Diabetes mellitus, hypertension, dyslipidaemia, smoking, family history of premature coronary artery disease, were defined according to the American College of Cardiology definitions for measuring the clinical management and outcomes of patients with acute coronary syndromes [12]. Obesity was defined as a BMI of ≥ 30 kg/m^2. Risk stratification was done according to thrombolysis in myocardial infarction (TIMI) risk in NSTEMI patients and assessment of killip class was done in STEMI patients. Categorical variables are expressed as frequencies and percentages. Continuous variables are expressed as mean and standard deviation.

Results

Baseline Characteristics

Table 1: shows the baseline characteristics of study participants.

A total of 180 female patients with diagnosis of acute myocardial infarction were enrolled in the study.

Age: In this study, the age of patients ranged from 35 years to 89 years and mean age was 64.71 ±9.7 years. Majority (45.55%) of patients were in the 56-65 years age group and 34 (18.88%) were ≤ 50 years of age.

Type of Presentation

In our study, 105 (58.33%) patients presented with STEMI and 75 (41.66%) patients had NSTEMI. Among patients with STEMI majority (57.14%) of patients had anterior wall myocardial infarction (AWMI), followed by (36.19%) inferior wall myocardial infarction (IWMI).

Out of 105 patients in STEMI group; 64 (60.95%**)** patients were in Killip class I, 30 (28.57%) in Killip classsII, 8 (7.61%) in Killip class III and 3 (2.85%) patients were in cardiogenic shock.

Out of 75 patients in NSTEMI group; 39 (52.00%) patients were in Low TIMI Risk category while 36 (48.00%) had medium-high TIMI Risk index.

Clinical Presentations

In our study, majority (83.33%) of patients presented with chest pain followed by dyspnea (28.88%), nausea and/or vomiting. (13.33%), Associated sweating (13.33%), palpitation (11.11%).

Table 1: Baseline Characteristics of the Study Population (N=180)

Characteristic	Mean, (Range)
Age (Years)	64.76 ± 9.9, (35-89)
BMI (kg/m2)	32.05 ± 6.42
Type of Presentation	No. (%)
STEMI	105 (58.33)
NSTEMI	75 (41.66)
Clinical presentations	No. (%)
Chest pain	150 (83.33)
Typical	114 (63.33)
Atypical	45 (25.00)
No chest pain	21 (11.66)
Dyspnea	52 (28.88)
Nausea/vomiting	24 (13.33)
Diaphoresis	24 (13.33)
Palpitations	20 (11.11)
Presyncope / Syncope	4 (2.22)
Cardiovascular Risk factors	No. (%)
Dyslipidemia	83 (46.11)
Hypertension	76 (42.22)
Obesity	72 (40.00)
Diabetes	42 (23.33)
Family H/O CAD	22(12.22)
Clinical history of ischemic heart disease	No. (%)
Prior angina	39 (21.66)
Prior myocardial infarction	20 (11.11)
Prior angioplasty	18 (10.00)
Prior bypass surgery	2 (1.11)
Comorbidities	No. (%)
Chronic kidney disease	14 (7.77)
Cerebrovascular disease	10 (5.55)
Peripheral vascular disease	3 (1.66)
Killip class (STEMI; N=105)	No. (%)
I (no heart failure)	64 (60.95)
II (heart failure)	30 (28.57)
III (pulmonary edema)	8 (7.61)
IV (cardiogenic shock)	3 (2.85)
TIMI Risk Index (NSTEMI; N=75)	No. (%)
Low TIMI Risk Index	39 (52.00)
Medium-high TIMI Risk Index	36 (48.00)
Addiction	No. (%)
Tobacco (Current)	6 (3.33)
Tobacco (Former)	4 (2.22)

Only 4 patients (2.22%) had presyncope/syncope. Typical chest pain was present in 114 patients (63.33%), 45 patients (25.00%) had atypical pain chest and 21 patients (11.66%) were pain free.

Cardiovascular Risk factors

In this study Dyslipidemia (46.11%) was the most common associate risk factor followed by hypertension (42.22%), obesity (40.00%), diabetes (23.33%), and 22 (12.22%) patients had family history of CAD. 79 patients (43.33%) had clinical history of ischemic heart disease with 39 patients (21.66%) had prior angina, 20 patients (11.11%) had history of myocardial infarction, 18 patients (10%) had prior angioplasty, and only 2 patients (1.11) had history of CABG.

Among study population, we found that 10 patients (5.55%) had a history of chronic tobacco use, out of them 6 patients (3.33%) were former tobacco users, and 2 patients (2.22%) were current tobacco users.

Discussion

In western literature, women with ACS are generally older, with more clustering risk factors than men, and are less likely to present with ST elevation. In our study mean age was 64.76± 9.9 years, which is lesser than western studies as study by Hochmann et al. [13] (69 years), and Chang et al. [14] (73 years), but our results are concordant to other studies conducted in India.

In the setting of acute MI, women more commonly present with Q-wave rather than non–Q-waveMI [15] and have less make ST segment elevations [16]. In our study, 58.33% patients had STEMI and NSTEMI was presentation in 41.66% patients thus STEMI was more common than NSTEMI which is contrast to western studies where NSTEMI is high as is observed in GRACE Registry (40% vs. 60%) and is parallel to study conducted by Praveen et al. [17]. in Indian female patients with acute myocardial infarction. Among patients with STEMI, AWMI (57.14%) was most common location of infract was followed by IWMI (36.19%), which is consistent with studies conducted by Jose and Gupta [18] and Kumar et al. [19] in Indian female patients with acute myocardial infarction.

In our study, majority (83.33%) patients had Chest pain as presenting symptom, in which 63.33% patients had typical chest pain, 25.00% had atypical chest pain and 11.66% presented without chest pain. Dyspnea (28.88%) was second most common presenting symptom in our study. These observations are comparable to other studies done by Ganeshan et al. [20] and Chowta et al. [21].

In evaluation of associated cardiovascular risk factors revealed that our data are also in keeping with recent data showing dyslipidemia was the commonest risk factor (46.11%) similar to the finding of Hochmann et al. (45.5%) [13]. As prevalence of hypertension rise in female patients with CAD in our study, 42.22% patient had hypertension. The presence of hypertension was comparable to other studies. In this study, prevalence of obesity was 40.00% which is parallel to study conducted by Oomman et al [22] in which 41% of women with CAD were obese. The prevalence of diabetes in our study population was comparable (23.33%) to other studies like Hochmann et al. Tobacco addiction as a risk factor was low in this study; this may be due to the low prevalence of tobacco use among women in India.

Conclusion

In our study the analysis of demographic profile revealed that Indian female patients with acute myocardial infarction present at younger age as compared to western women. Chest pain was most common presenting symptoms and STEMI was more frequent than NSTEMI. Dyslipidemia was the most common associated risk factor followed by hypertension, obesity, and diabetes.

References

1. Maas AH, van der Schouw YT, Regitz-Zagrosek V et al. Red alert for women's hearts: The urgent need for more research and knowledge on cardiovascular disease in women. Proceedings of the workshop held in Brussels on 'Gender Differences on Cardiovascular Disease'. Eur Heart J, 2011.
2. Douglas PS, Ginsburg GS. Current concepts: the evaluation of chest pain in women. N Engl JMed. 1996;334(20):1311-15.
3. Summers RL, Cooper GJ, Woodward LH, Finerty L. Association of atypical chest pain presentations by African-Americans and the lack of utilization of reperfusion therapy. Ethn Dis. 2001;11(3):463-68.
4. Milner KA, Funk M, Arnold A, Vaccarino V. Typical symptoms are predictive of acute coronary syndromes in women. Am Heart J. 2002;143(2):283-88.
5. Dorsch MF, Lawrence RA, Sapford RJ, et al; EMMACE Study Group. Poor prognosis of patients presenting with symptomatic myocardial infarction but without chest pain. Heart. 2001;86(5):494-98.

6. Canto JG, Shlipak MG, Rogers WJ, et al. Prevalence, clinical characteristics and mortality among patients with myocardial infarction presenting without chest pain. *JAMA*. 2000;283(24):3223-29.
7. Lusiani L, Perrone A, Pesavento R, Conte G. Prevalence, clinical features and acute course of atypical myocardial infarction. Angiology. 1994;45(1):49-55.
8. Stramba-Badiale M, Fox KM, Priori SG et al. Cardiovascular diseases in women: A statement from the policy conference of the European Society of Cardiology. Eur Heart J, 2006;27:994–1005.
9. Yusuf S, Hawken S, Ounpuu S, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. Lancet. 2004;364:937.
10. Rosamond W, Flegal K, Furie K et al.; for the Writing Group Members. Heart disease and stroke statistics — 2008 update: A report from the American Heart Association Statistics Committee and Stroke Statistics Sub-committee. Circulation, 2008;117:e25–e146.
11. Thygesen K, Alpert JS, Jaffe AS, Simoons ML, Chaitman BR. White HD; the Writing Group on behalf of the Joint ESC/ACCF/AHA/WHF Task Force for the Universal Definition of Myocardial Infarction. Third universal definition of myocardial infarction. Circulation 2012;126:2020-35.
12. Cannon CP, Battler A, Brindis RG, Cox JL, Ellis SG, Every NR, et al. ACC Key Elements and Data Definitions for Measuring the Clinical Management and Outcomes of Patients with Acute Coronrary Syndromes: a report of the American College of Cardiology Task Force on Clinical Data Standards (Acute Coronary Syndromes Writing Committee). J Am Coll Cardiol 2001;38:2114–30.
13. Hochman JS, Tamis JE, Thompson TD, Weaver WD, White HD, Van deWerf F, et al. Sex, clinical presentation, and outcome in patients with acute coronary syndromes. Global Use of Strategies to Open OccludedCoronary Arteries in Acute Coronary Syndromes IIb Investigators. N Engl J Med 1999;341:226-32.
14. Chang WC, Kaul P, Westerhout CM, Graham MM, Fu Y, Chowdhury T,et al. Impact of sex on long-term mortality from acute myocardial infarction vs unstable angina. Arch Intern Med 2003;163:2476-84.
15. Hsia J, Aragaki A, Bloch M, LaCroix AZ, WallaceR; WHI Investigators. Predictors of angina pectoris versus myocardial infarction from the women's health initiative observational study. Am J Cardiol. 2004;93(6):673-78.
16. Dellborg M, Herlitz J, Emanuelsson H, Swedberg K. ECG changes during myocardial ischemia: differences between men and women. J Electrocardiol. 1994;27(suppl):42-45.
17. Parveen K, Haridas KK, Prabhakaran D, Xavier D, Pais P, Yusuf S. Patterns of acute coronary syndromes in India: The CREATE registry. Indian Heart J 2002;54:A2.
18. Jose VJ, Gupta SN. Mortality and morbidity of acute ST segment elevation myocardial infarction in the current era. Indian Heart J 2004;56:210-4.
19. Kumar N, Sharma S, Mohan B, Beri A, Aslam N, Sood N, et al. Clinical and angiographic profile of patients presenting with first acute myocardial infarction in a tertiary care center in northern India. Indian Heart J 2008;60:210-4.
20. Ganeshan N, Anuradha G, Subramanian G, Alagesan R, Moorthy C, Shankar GR, et al. Acute myocardial infraction without chest pain clinical profile. Indian Heart J 2004;56:395.
21. Chowta KN, Prijith PD, Chowtha MN. Modes of presentation of acute myocardial infraction. Indian J Crit Care Med 2005;9:151-4.
22. Oomman A, Sathyamurthy I, Ramachandran P, Verghese S, Subramanyan K, Kalarickal MS, et al. Profile of female patients undergoing coronary angiogram at a tertiary centre. J Assoc Physicians India 2003;51:16-9.