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Original Research Article

Sex differences in clinical presentation in acute MI

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ABSTRACT

Background: Acute myocardial infarction differs in women and men with respect to risk factors and clinical presentation. There are studies carried out worldwide on this issue but few from India. This study was done to study the sex based differences in the risk factors and clinical features of acute MI in patients with Indian ethnicity.
Methods: Comparative prospective study consisting of 100 women as study group and 100 men as control group with acute MI, who were admitted in a tertiary care hospital, from December 2016 to June 2017.
Results: Chest pain was the main complaint in majority of the women (82%) and men (88%). Radiation of chest pain (87%) and sweating (90%) were significantly present in men compared to women (65% and 62% respectively), while breathlessness was significantly present in women (78%) compared to men (64%) and fatigue in women (76%) significantly more than men (55%). Smoking was a significant risk factor in men (69%) compared to women (5%), while diabetes mellitus was a significant risk factor in women (62%) compared to men (39%).
Conclusions: Women with acute MI had more atypical presentation of symptoms, similar risk factors, compared to men except for smoking which was more significant in men and diabetes more common in women.

Keywords: Acute myocardial infarction, Sex

INTRODUCTION

The delay in onset of acute MI in women compared to men is presumably due to pre-menopausal exposure to endogenous ovarian estrogen.[1] In females CAD is increased around the time of menopause when the estrogen in plasma begins to decline. It is observed in studies that atheromatous fatty streak and atheromatous plaque exist both in men and in women. The extent of fatty streak in both men and women is a function of plasma level of LDL cholesterol and in women, VLDL cholesterol, which is closely related to the triglyceride level. The lesions in female are more lipid filled, rich in macrophage and less densely fibrous.[2] Thus, lesion could be more unstable under certain circumstances. Likewise, coronary calcification is half as that of men on ultrafast computed tomography until age 60, 3 when difference between age narrows. Recognition of chest pain of cardio vascular etiology in women is difficult to diagnose because,

- It is not expected
- Atypical, non-cardiac chest pains are more common in women compared to men.

True angina may not be typical. Because of atypical symptoms misdiagnosis is common. The reason for lack of classic anginal symptom in spite of having validated myocardial ischemia is unknown. The greater incidence of silent MI in women may be related to atypicality of chest pain presentation.[1]

Need for the study

There are many studies conducted in the Western world comparing the profile of ACS in women and men.[4-9]

But there are very few comparative studies of acute MI between men and women in India. Thus, this study was done to study the sex based differences in clinical presentation of acute MI.

The objective of this study was to study the risk factors and clinical presentation of acute MI in women in comparison with men.

METHODS

Source of data

Comparative prospective study of 100 women and 100 men with acute MI admitted in the Intensive coronary care unit in a tertiary hospital from December 2016 to June 2017.

Inclusion criteria

- Women with ST elevation myocardial infarction
- Men with ST elevation myocardial infarction.

Exclusion criteria

- Patients with chronic stable angina
- Women with unstable angina or non-ST elevation MI
- Men with unstable angina or non-ST elevation MI.

This study was carried out on patients admitted with ST elevation MI in the ICCU under Medicine Department at a tertiary care hospital, from December 2016 to June 2017.

At the time of admission, a complete history was taken and a meticulous physical examination was done. 12 lead ECG was done at the time of admission and repeated if necessary. Cardiac enzymes like CK-MB and Trop T were done at the time of admission to confirm the diagnosis of STEMI. Weight and height of every patient was determined to calculate the BMI to diagnose obesity. Fasting blood glucose and HbA1C were measured to diagnose or confirm the presence of diabetes mellitus.

Statistical methods

Chi square test/Fisher Exact test and student t test have been used to find the significant association of study characteristics and parameters between women and men.

- Chi-Square test
- Fisher exact test
- Student t-test
- Significant figures

Moderately significant $0.01<P \leq 0.05$, Highly significant $P \leq 0.01$.

RESULTS

Comparative prospective study consisting of 100 women and 100 men from December 2016 to June 2017 was undertaken to study the risk factors and clinical profile of acute MI in women in comparison to men.

Table 1: Comparison of symptoms between women and men.

Symptoms	Women		Men		P-value
	No.	%	No.	%	
Chest pain	82	82	88	88	0.322
Radiation of chest pain	65	65	87	87	*0.0004
Sweating	62	62	90	90	**0.0001
Breathlessness	78	78	64	64	***0.0423
Fatigue	76	76	55	55	****0.0028

*P<0.01 highly significant; ** P<0.01 highly significant; ***0.01<P≤0.05 moderately significant; **** P<0.01 highly significant.

In this study, chest pain was the predominant symptom in both men (88%) and women (82%). Radiation of chest pain was significantly present in men (87%) compared to women (65%). Sweating was a significant complaint in men (90%) compared to women (62%). Breathlessness was significantly more common in women (78%) compared to men (64%). Fatigue was predominant in women (76%) compared to men (55%).

Among the risk factors, smoking was significantly more common in men (69%) compared to women (5%). Diabetes mellitus was statistically more common in women (62%) compared to men (39%). The other risk factors were more common in men compared to women though not statistically not significant- hypertension 56% women and 60 % men, and obesity 36% women and 48% men.

Table 2: Comparison of risk factors between women and men.

Risk factor	Women		Men		P-value
	No.	%	No.	%	
Hypertension	56	56	60	88	0.6675
Diabetes mellitus	62	62	39	87	*0.0114
Smoking	5	5	69	90	**0.0001
Obesity	36	36	64	48	0.1148

***0.01<P≤0.05 moderately significant; **** P<0.01 highly significant.

DISCUSSION

A number of studies have highlighted the differences between men and women in the risk factors and clinical profile of acute coronary syndromes. Several studies have brought out the differences in the clinical profile between the sexes.[4-10]

The observations made in 100 women with acute coronary syndrome as study group and 100 men with acute coronary syndrome as control group who are admitted in ICCU of a tertiary care centre are included in the study.

Table 3: Comparison of risk factors for acute MI in various studies.

Risk factors	Devon et al[5]		Gottleib et al[9]		Jneid et al[4]		Vaccarino et al[10]		Present study women	Present study-men
	W	M	W	M	W	M	W	M		
Diabetes mellitus	38	29	35	23	33	28	33	24	62	39
Hypertension	73	63	54	34	68	58	59	47	56	60
Obesity	48	42	-	-	-	-	-	-	36	48
Smoking	21	32	14	43	22	33	19	29	05	69

Diabetes mellitus

The incidence of diabetes in women in various studies varied from 33 to 38% while in present study 62% women had diabetes mellitus. The incidence of diabetes in men in various studies ranged from 23 to 29% while present study showing incidence of 39% among men.

Hypertension

The incidence of hypertension in women in various studies varied between 54 to 73%. The present study showed an incidence of 56% in women- which is comparable to Gottleib et al. The incidence of hypertension in men in various studies varied from 34 to 63% while in the present study, 60% men were hypertensives which was comparable to Jneid et al.

Obesity

The prevalence of obesity in our study was 36% in women and 48% in men.

Smoking

Smoking (69.0%) was the significant risk factor in men compared to 5% of women in the present study. The incidence of smoking in women in various studies ranged from 14 to 22% and in men from 29 to 43%.

Table 4: Clinical presentation comparison in various studies.

Symptoms	Chen et al[7]		Engoren et al[6]		Present study (%) (W)	Present study (%) (M)
	W	M	W	M		
Chest pain	76	92	78	85	82	88
Radiation	83	76	23	25	65	87
Sweating	57	53	28	33	62	90
Breathlessness	72	61	52	50	72	64
Fatigue	70	62	-	-	76	55

Chest pain and sweating

Chest pain was the most common presenting symptom in this study (82% of women and 88% of men). Pain was associated with sweating in 62% (W) and 90% (M). In other studies, chest pain was seen in 76 to 78% women and 85 to 92% of men and sweating was seen in 28 to 57% of women and 33 to 53% of men. The present study was comparable to other studies.

Radiation of pain

Radiation of pain in women in various studies ranged from 23 to 83% while in the present study 65% women had radiation of pain. Radiation of pain in men in various studies ranged from 25 to 76% while present study showed an incidence of 87%.

Breathlessness

Breathlessness was observed in 72% women and 64% men which was comparable to Chen et al.

Fatigue

76% of the women and 55% of the men had fatigue in the present study which was comparable to Chen et al.

CONCLUSION

Women and men with acute MI both had chest pain as their predominant symptom. Breathlessness and fatigue were more common in women while radiation of pain and sweating were more common in men. Smoking was a more common risk factor in men while diabetes was a more common risk factor in women. Thus, women and men with acute STEMI differ with respect to risk factors and clinical presentation

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