

# Gender Differences in Presenting Symptoms and Outcome in Myocardial Infarction

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## Abstract

**Introduction:** Cardiovascular disease is the leading cause of death among women, regardless of race or ethnicity, accounting for deaths of 1 in 3 women. Mortality rates for coronary heart disease have fallen for both men and women, but the rate of fall is much less in women than men.

**Aim:** The aim of the study was to compare the presentation and outcome of acute myocardial infarction (AMI) in men versus women.

**Materials and Methods:** All patients satisfying the diagnosis of myocardial infarction were included in the study. All acute myocardial infarction cases were divided into men and women. A detailed evaluation of patients presenting with AMI was done. Clinical presentations, risk factors, vitals, and killip functional classification, electrocardiography were recorded.

**Results:** Diabetes mellitus found to be 46% in women and 38% in men. Out of 100 females, 60 had precordial chest pain, and 33 had retrosternal chest pain. Evidence of left ventricular failure was more common in women. Thrombolysis was done in 20% of women, where 60% of men undergone thrombolysis. AMI leading to death was reported high in women (9%) followed by men (6%).

**Conclusion:** Coronary artery diseases in women continue to be a major public health problem that represents a leading cause of death and disability. Better understanding of gender differences in manifestation and detection of myocardial ischemia is a critical initial step to improve outcomes for women.

**Key words:** Coronary artery disease, Gender bias, Women health

## INTRODUCTION

Acute myocardial infarction (AMI) is continuous to be a major public health problem in developing country like India. Coronary care practice is nowadays better equipped than other fields of cardiovascular medicines to reduce the morbidity and mortality.<sup>[1]</sup> In comparison with the people of European ancestry, cardiovascular disease (CVD) affects Indians at least a decade earlier and in their most productive midlife years.<sup>[2,3]</sup> For example, in Western populations only 23% of CVD deaths occur before the age of 70 years;

in India, this number is 52%.<sup>[4]</sup> In addition, case fatality attributable to CVD in low-income countries, including India, appears to be much higher than in the middle- and high-income countries.<sup>[4,5]</sup> Although CVD risk factors are widely prevalent in India, there are significant variations between and within different regions. Diabetes mellitus (DM) appears to be more prevalent in the southern states of India, whereas hypertension (HTN) appears to be higher in the northeastern states. Although this heterogeneity can be attributed to diversity in culture (leading to differences in dietary practices, tobacco use, and physical activity patterns) and variations in economic development between and within different states in India, it is important to understand the social determinants.<sup>[6]</sup> The cardiovascular anatomy and physiology of women differ from men in many ways. Women have comparatively smaller chests, hearts and different body structure and fat distribution. The life expectancy of women and men varies. Due to their underlying survival advantage, female patients may

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appear to have a similar or even good long-term outcome after MI than men do, even if the disease has a greater impact on women's survival than on men's. Consequently, failure to account for gender differences in the absence of MI may lead to underestimation of the burden of MI on women's mortality.<sup>[7]</sup>

### Aim

The aim of the study was to compare the presentation and outcome of AMI in men versus women.

## MATERIALS AND METHODS

This prospective observational study was conducted in the Department of Medicine at Tirunelveli Medical College. All patients satisfying the diagnosis of MI were included in the study. All acute myocardial infarction cases were divided into men and women. A detailed evaluation of patients presenting with AMI was done. Clinical presentations, risk factors, vitals, and Killip functional classification, electrocardiography (ECG) were recorded. Serial ECG, routine biochemical analysis and required other lab procedures were done.

## RESULTS

A total of 300 patients were included in this study, 100 females and 200 males. The most common symptom is typical chest pain. Duration of chest pain to hospitalization varies between 2 and 72 h. AMI was found to be more common in men than women. DM found to be 46% in women and 38% in men [Table 1]. Among women, 42%

**Table 1: Distribution of site of MI**

Site	Female	Male
Anterior wall	50	94
Inferior wall	29	67
Anteroseptal	20	33
Lat wall	1	6

MI: Myocardial infarction

**Table 2: Distribution of risk factors**

Risk factors	Female	Male
DM	46	76
HTN	35	57
Smoking	Nil	85
Hyperlipidemia	42	72
Obesity	27	49

HTN: Hypertension, DM: Diabetes mellitus

**Table 3: Distribution of complication**

Complication	Female	Male
LV failure	33	51
Death	9	12

had elevated total cholesterol followed by men 36%. 35% of women were found hypertensive, where 28.5% of men found hypertensive in this study [Table 2]. Out of 100 females, 60 had precordial chest pain, and 33 had retrosternal chest pain. The most common infarction is anterior wall MI which is very common in male patients also. Next common site is inferior wall MI. Evidence of LVF was more common in women [Table 3]. Thrombolysis was done in 20% of women, where 60% of men undergone thrombolysis. AMI leading to death was reported high in women (9%) followed by men (6%).

## DISCUSSION

The American heart association reports the signs and symptoms of MI with no distinction between women and men. These are uncomfortable pressure, fullness, squeezing, or pain in the center of the chest, pain that spreads to shoulders neck or arms, chest discomfort with lightheadedness, fainting, sweating, nausea, or shortness of breath.<sup>[8]</sup> McCance and Huether describe the common symptoms of MI as chest pain that is heavy or crushing, chest pain with nausea and/or vomiting, diaphoresis, shortness of breath, or radiation to neck, jaw, back, or left-arm.<sup>[9]</sup> Patients may complain of a feeling of weakness, severe indigestion, shortness of breath, or chest discomfort.<sup>[10]</sup>

Sex differences in the cardiovascular system are as a result of differences in gene expression from the sex chromosomes, which may be further modified by sex differences in hormones, resulting in sex-unique gene expression and function. These differences result in variations in prevalence and presentation of cardiovascular conditions, including those associated with autonomic regulation, HTN, DM, and vascular and cardiac remodeling. In contrast, gender differences are unique to the human and arise from sociocultural practices (behaviors, environment, lifestyle, and nutrition).

The increasing prevalence of Type 2 DM is concerning because it is a potent risk factor for atherosclerotic CVD and has long been recognized to confer greater risk for atherosclerotic CVD death in women compared with men.<sup>[11]</sup> The impact of obesity on the development of coronary artery disease (CAD) seems to be greater in women than in men. In the Framingham Heart Study, obesity increased the relative risk of CAD by 64% in women, as opposed to 46% in men.<sup>[12]</sup>

## CONCLUSION

CVD research has focused primarily on men, thus leading to an underappreciation of sex differences from an

etiologic, diagnostic, and therapeutic perspective. The incidence of AMI among women was less when compared to men. The prevalence of risk factors such as DM, HTN, and obesity was high among women when compared to men. Most of the women presented with characteristics features of AMI. The common presenting symptom was chest pain. Left ventricular failure at presentation was more common in women than men.

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