

# Risk Stratification of Acute Myocardial Infarction in Rural Women

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## Abstract

**Introduction:** The prevalence of coronary heart disease (CHD) is rapidly increasing in India. Cardiovascular disease, especially, CHD is a major contributor to mortality and morbidity in India. Epidemiological transition, with increase in life expectancy and demographic shifts of population, age - profile, combined with life style-related changes increases in levels of cardiovascular risk factors accelerates the CHD epidemic in India.

**Aim:** This study is aimed at risk stratification of acute myocardial infarction in women on admission and assesses the role of modifiable and non-modifiable risk factors in women.

**Materials and Methods:** Sixty female patients were included in the study. While most of the patients were evaluated prospectively, in case of a few patients who expired soon after admission, the data were analyzed retrospectively.

**Results:** Diabetes mellitus, hypertension (HTN), and hypercholesterolemia were seen highly in this study group. 68% of women were used tobacco, 60% had family history of disease. Isolated systolic HTN, obesity, and tobacco chewing shown high-mortality rate in the study group.

**Conclusion:** All high-risk women with coronary disease should receive optimal medical management, and be considered for coronary angiography with possible revascularization if their coronary anatomy warrants it.

**Key words:** Heart disease, Risk factors, Women health

## INTRODUCTION

The prevalence of coronary heart disease (CHD) is rapidly increasing in India. Cardiovascular disease, especially, CHD is a major contributor to mortality and morbidity in India.<sup>1,3</sup> Epidemiological transition, with an increase in life expectancy and demographic shifts of population, age - profile, combined with life style-related changes increases in levels of cardiovascular risk factors accelerates the CHD epidemic in India.<sup>4</sup> The most important risk factor for CAD in women is the misconception that CAD is not a woman's disease. This misconception is gradually being corrected but still has important influences on all aspects of

prevention, diagnosis, and treatment. This also leads to the neglect of formal risk assessment and failure to aggressively treat CAD once it has been detected. In addition, a woman's presentation style alters physicians' estimates of the likelihood of CAD.<sup>5</sup> Women are on average 5-10 years older at the time of presentation. Perhaps, even more than in men, the prevalence of angiographic coronary disease vary dramatically according to the nature of the chest pain, the patient's age, and the presence and type of coronary risk factors. This underlines the importance of good history taking and careful cardiovascular risk factor assessment in the evaluation of women with chest pain.<sup>6</sup> A variety of factors influence the evaluation of chest pain in women, including patient and physician perception of disease risk. Compared with men, women with chronic stable angina are older and more likely to have hypertension (HTN), diabetes, and congestive heart failure, but less likely to have had a prior myocardial infarction or revascularization. Although equally likely to have effort angina, such women are more likely to experience pain at rest, during sleep, or with

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mental stress and to have nausea and jaw, back, neck pain or palpitations.<sup>7,8</sup> They are less likely to report diaphoresis than men. These differences make the evaluation of new symptom or disability more complex and make essential gender-based approach to education of both lay and health personnel in the presentation of acute ischemic syndromes. Hence, a complete study on the presenting features, clinical manifestations, and treatment modalities offered and outcome in acute myocardial infarction (AMI) in women is an important challenge that involves recognition by both patients and physicians.

### Aim

Risk stratification of AMI in rural women on admission and assess the role of modifiable and non-modifiable risk factors in women.

## MATERIALS AND METHODS

This study was conducted at Rajah Muthiah Medical College and Hospital, 1200 bedded tertiary care teaching hospital in Chidambaram, Tamil Nadu, India. The study period was 1 year.

### Inclusion Criteria

All female patients between age 30 and 90 years admitted in intensive care unit (ICU) with a history of chest pain lasting for more than 30 min, not relieved by nitrates at rest with typical electrocardiogram changes of AMI and raised cardiac enzymes were included in the study.

A detailed history taking was done through questionnaire which includes complete obstetric history, family history, personal history, and clinical findings. Investigations, treatment, complication, outcome, and observation are also noted for every patient. The results were tabulated and analyzed.

## RESULTS

In our study, 60 female patients in age from 30 to 90 years admitted in ICU were admitted. 38% of patients were from 60 to 69 years followed by 50-59 years (Table 1). Diabetes mellitus (DM), HTN, and hypercholesterolemia were seen highly in this study group. 68% of women were used tobacco, 60% had family history of disease (Table 2). Isolated systolic HTN, obesity, and tobacco chewing shown high-mortality rate in the study group (Table 3).

## DISCUSSION

In this study that included 60 patients, during 1 year, maximum incidence of AMI was observed in women in the

**Table 1: Age-wise distribution of study population**

Age group	Number of patients (%)
30-39	0 (0)
40-40	10 (16.6)
50-59	13 (21.6)
60-69	23 (38.3)
70-79	10 (16.6)
80-89	4 (6.6)
Total	60 (100)

**Table 2: Incidence of risk factors**

Risk factors	Number of patients (%)
DM	49 (81.6)
HTN	47 (78.3)
Isolated systolic HTN	10 (16.6)
DM and HTN	47 (78)
Obesity	27 (45)
Tobacco chewing	41 (68)
Hypercholesterolemia	46 (76.67)
Family history CAD	36 (60)

DM: Diabetes mellitus, HTN: Hypertension, CAD: Coronary artery disease

**Table 3: Incidence of risk factors with mortality**

Risk factors	Number of patients	Mortality	Percentage
DM	49	8	16.3
HTN	47	10	21.3
Isolated systolic HTN	10	3	30
DM and HTN	47	7	14.9
Obesity	27	8	29.6
Tobacco chewing	41	9	22
Hypercholesterolemia	46	10	21.7
Family history CAD	36	7	19.4

DM: Diabetes mellitus, HTN: Hypertension, CAD: Coronary artery disease

age group of 60-70 years, 23 cases (38.3%). Age appears to be the strongest cardiovascular risk factor that remains non-modifiable. 12 patients (20%) were below 50 years of age, and 48 patients (80%) were above 50 years of age. The incidence of AMI is 0% below 40 years of age and 7% above 80 years of age. This age predominance in females is due to the loss of the protective effect of estrogen after menopause.

In this study, 36 patients (60%) gave a positive family history of coronary artery disease (CAD). The total incidence of HTN in AMI is 47 patients (78.3%). This is more than western population, where the fraction of CHD attributable to HTN is approximately 20%. The increased awareness of HTN and the advent of various drugs to control blood pressure attributes to the reduced incidence in western countries. 10 patients (21.7%) expired while under treatment.<sup>6</sup>

DM is a strong risk factor for CAD in women than in men. Mortality rates for CAD are 3-7 times higher

among diabetic women than among non-diabetic women. Diabetes exacerbates the effect of known coronary risk factors and may impair the estrogen binding, negating the protection against CAD. In this study, 49 patients (81.6%) had diabetes. The incidence of diabetes is high in our study population when compared to 20% incidence in the western population. This may be due to poor control of hyperglycemia and due to the association of DM combined with other cardiovascular risk factors. The incidence of AMI is more in female diabetics when compared to males. This is due to the fact that female diabetics have lower high-density lipoprotein and higher very low-density lipoprotein than their male counterparts. The presence of diabetes is one of the strongest risk factor in women and our study confirms the same. The mortality in diabetic female patients is 16% in this study. 47 patients (78.5%) had both diabetes and HTN in this study, and the mortality was 7 patients.<sup>9,10</sup> None of the patients in this study had given the history of smoking or alcohol, but 41 patients (68%) were habitual tobacco chewers. Use of tobacco is also a strong risk factor for CAD. The mortality rate among tobacco chewers was 75%. The effect of tobacco with an elevated risk of CAD in women is understudied. The World Health Organization data suggests that absolute risk of MI in women who smoke is greatly elevated by the use of combined oral contraceptives and indicates 10 times higher risk. However, in our study, we did not encounter any smokers or oral contraceptive users.<sup>11,12</sup>

46% of the patients had hypercholesterolemia, and 47% of the patients were obese with body mass index > 30. The mortality among obese patients was 20%. In our study, all the study patients were multiparous, of which 14 patients (23.33%) had six or more pregnancies. Five multiparous patients (8.33%) expired during the study.

## CONCLUSION

The study concludes that women suffering from AMI are likely to be older than 60 years and more likely to have a history of HTN, diabetes, hypercholesterolemia, and obesity. The maximum incidence of AMI occurred in the post-menopausal age group. All women were multiparous, and women with six or more pregnancies had a high-mortality rate. Women are more likely to experience neck and shoulder pain, abdominal pain, nausea, vomiting, fatigue, and dyspnea in addition to classical chest pain.

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