

## Original Research Article

# A comparative study of clinical profile, severity and outcome of acute coronary syndrome in women and men admitted to a tertiary hospital

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## ABSTRACT

**Background:** CAD has emerged as a major health burden in developing countries. Many recent reports concluded that women with CAD have a worse prognosis than men and also with regards to invasive interventions when compared to men. In this study, author determined the comparative outcomes of ACS in women when compared with men.

**Methods:** This study was conducted in a tertiary care hospital from November 2016 to March 2018. History taking, ECG, cardiac enzymes, 2D-Echo and angiogram were done to diagnose ACS and the appropriate treatment was given. The severity was assessed and compared the outcomes along with complications.

**Results:** The total of 112 patients were treated for ACS, in which, 55 were females and the remaining 57 were males. Majority of the patients in both genders was between the ages of 51-60. In males, STEMI noted 50.8%, NSTEMI in 36.8%, UA in 12.2%. In females, STEMI is noted in 62%, unstable angina in 32.7%, NSTEMI in 27.2%. Six patients (11%) had mortality in the women group and one (1.8%) had died among men.

**Conclusions:** Atypical presentation of ACS was more common in females. Women with ACS had higher complications and higher mortality than men.

**Keywords:** ACS- Acute coronary syndrome, CAD- Coronary Artery Disease, NSTEMI- Non-ST segment elevation myocardial infarction, STEMI- ST segment Elevation Myocardial Infarction, UA- Unstable angina

## INTRODUCTION

Cardiovascular diseases have emerged as a major health burden in developing countries. Significant differences in the prevalence of coronary artery disease (CAD) exist with respect to gender, age, and ethnicity. It is predicted that more than half of the worldwide cardiovascular disease risk burden will be borne by the Indian subcontinent in the next decade, according to a recent epidemiological study. In 2003, the prevalence of CAD in India was estimated to be 3-4% in rural areas and 8-10%

in urban areas (six-fold higher compared with 40 years ago).<sup>1</sup> In all the post-menopausal women and age matched men, the prevalence of CAD is equal. At any given age the prevalence of CAD is greater in men when compared to women. Nonetheless, many recent reports concluded that women with CAD have a worse prognosis than men with this disease.<sup>2</sup>

A randomized sub study of the OASIS trial (Organization to Assess Strategies in Acute Ischemic Syndromes) and an accompanying meta-analysis of prior studies of

percutaneous coronary intervention (PCI) in women presenting with an acute coronary syndrome (ACS) suggest that women do worse with an early invasive strategy.<sup>3</sup>

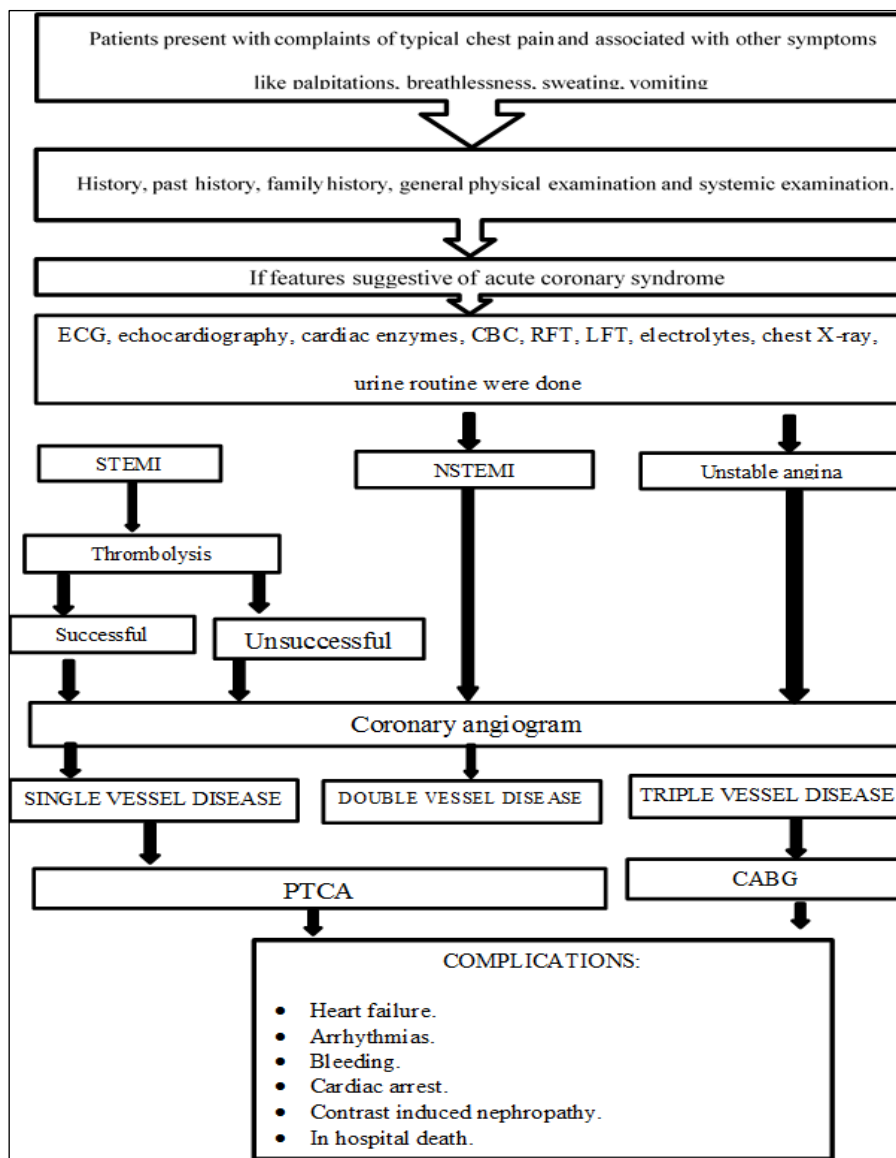
In a study undertaken in Kerala at a tertiary center, women with STEMI had higher mortality rates than males with STEMI.<sup>4</sup> There are very few studies conducted on Indian women. This study attempts to highlight the clinical profile of acute coronary syndromes, with particular reference to the Indian women.

**METHODS**

This study was conducted in a tertiary hospital during the period of November 2016 to March 2018. After getting the Institutional Human Ethics committee approval,

patients who were diagnosed to have acute coronary syndrome were involved as study participants. The diagnosis of ACS was made according to WHO criteria. Whenever patient was diagnosed to have acute coronary syndrome, he/she was contacted immediately. Male and female patients were separated. Details of the study was explained. Informed consent was obtained. All the patients admitted to medical intensive care unit and ward were recruited for the study. The diagnosis was established by taking proper history, ECG, cardiac enzymes, echocardiography and angiogram and the severity of ACS was assessed.

Complications during the hospital stay were noted. Treatment was given according to the cardiologist’s advice. The study was done according to the statistical analysis SPSS 21.0 version, Chi-square test and values expressed in mean and percentage (Figure 1).



**Figure 1: Description of methodology of the study.**

**RESULTS**

**Age and gender distribution**

In this study, out of 112 patients 57 were men and the rest 55 were women. The youngest patient was 36 years in men and 38 years in women, the oldest was 78 years in men and 82 in women. The average age of the patients in study group is 57.6 years. In comparison to men, age distribution for the study group is not significant among women.

**Symptomatology**

Atypical chest pain was present in 5 female patients among 55 whereas in male patients it was not seen. P-value is 0.003.

**Risk factors**

Family history and Dyslipidaemia were the major risk factor in females as compared to males. Among 55 women, except one, rest of all 54 women were post-menopausal and are statistically significant.

Smoking, Alcohol, Hypertension, Diabetes, were the major risk factors among men as compared to women and are statistically significant.

**Comparison of diagnosis based on History, ECG, Cardiac enzymes**

**Table 1: Comparison of diagnosis between male and female patients.**

STEMI	Male		Female		chi-square	p-value
	n	%	n	%		
AWMI	18	31.5	7	12.7	5.737	0.017
LWMI	2	3.5	2	3.6	0.001	0.971
IWMI	9	15.7	9	16.3	0.007	0.934
IWMI + right and post. wall involvement	0	0	2	3.6	2.110	0.146
SWMI	0	0	2	3.6	2.110	0.146
Total of STEMI	29	50.8	22	62	1.335	0.247
NSTEMI	21	36.8	15	27.2	1.175	0.278
UA	7	12.2	18	32.7	6.749	0.009

Among males, STEMI accounted for 50.8% in males followed by STEMI, in which anterior wall ST elevation is of 31.5% followed by Inferior wall ST elevation which is of 15.7%. NSTEMI is seen in 36.8% followed by UA in 12.2%. Among females, STEMI is accounted for 62%, in which inferior wall ST elevation is seen in 16.3%. Unstable angina is seen in 32.7%, followed by NSTEMI

(27.2%). P value is not significant for STEMI patients in our study (Table 1).

**Comparison of 2D-echocardiography findings between male and female**

Most men had normal LV function (n=35), mild LV dysfunction (11) and moderate LV dysfunction (n=11) was noted as abnormal findings in 2D-echo. Only one patient who is female had severe LV dysfunction in the entire study group. Majority of women, as compared to men had normal LV function (p=0.004) (Table 2).

**Table 2: Findings of 2D echocardiography in the study group.**

2D ECHO	Male	Female	chi-square	p-value
Normal LV Function	35	47	8.256	0.004
Mild LV Dysfunction	11	2	6.692	0.010
Moderate LV Dysfunction	11	5	2.382	0.123
Severe LV Dysfunction	0	1	1.046	0.306

**Comparison of angiogram findings between male and female**

Most of the men (56.1%) in the study group were diagnosed to have Single vessel disease, followed by 19.3% of them with double vessel disease and 17.5% of them had triple vessel disease. Most women (43.7%) had double vessel disease in the study group, followed by single vessel disease in 24.6% and triple vessel disease in 14.5%. Double vessel disease is significant in women compared to men in the study group.

**Comparison of duration of stay and complications**

The mean duration of stay for men was 8.49 days (range 4-13 days) and for women was 10.93 days (range 5-16 days) and was statistically significant (p-value=0.010). 87.7% of men and 83.7% of women have no complications and was not statistically significant (p=0.537). In the present study group, men (87.7%) and women (83.7%) have no complications. However, complications in men and women are not statistically significant (p=0.537).

**Comparison of outcome of ACS between male and female**

The mean duration of stay for men was 8.49 days (range 4-13 days) and for women was 10.93 days (range 5-16 days). Duration of stay in due course of hospital was not significant among both sexes. Six patients (11%) had

mortality in the women among study group. While only one (1.8%) had died among men (Table 3).

**Table 3: Outcome of the study group.**

Outcome	Male		Female		Chi-square	p-value
	n	%	n	%		
Dead	1	1.8	6	11	4.004	0.005
Alive	56	98.2	49	89		

## DISCUSSION

Cardiovascular disease is now a major cause of morbidity and mortality for both men and women, particularly acute coronary syndrome. In this study, author intend to discuss the risk factors, clinical profile, severity and outcome in both women and men.

The total number of patients were 112 patients in which 57 were men and the rest 55 were women. The study group was more or less comparable. The age difference was not statistically significant.

98.8% of women were post-menopausal. Post-menopausal hormone replacement therapy has proved to reduce the relative risk of coronary artery disease to 0.3-0.79 and improved survival in women. Thus, menopause is a strong risk factor for ACS in women.

Hypertension was seen in 70% in females and 68% in males in this study, one third of which were newly detected. In comparison with other studies, hypertension was a significant risk factor, but no significant difference was there in the incidence of hypertension between men and women in this study.<sup>5-9</sup>

The incidence of diabetes mellitus in various studies varied from 26 to 56%.<sup>5,6,8,9</sup> In the present study, 34 (59.6%) females and 30 (54.6%) males were diabetics, in which one third were newly detected during the time of admission. Although, there is no significant difference between men and women, diabetes mellitus is known to be a significant risk factor for acute coronary syndrome.

Family history of premature CAD was seen in 7-37% in various studies.<sup>5,6,8,9</sup> In this study, 69% of women and 26% of men has family history of premature CAD. Higher incidence of family history of ischemic heart disease among women was noted.

The incidence of dyslipidaemia was noted in 34.5% of women and 15.8% of men. Most men in this study group were heavy workers (44%) which could have attributed to smaller cohort of dyslipidaemia among them.

In the present study, none of the women had tobacco use in any form and none of them used oral contraceptives. Smoking (33.3%) was the significant risk factor in males.

Among 15 young male patients, 5 patients were smokers and 4 had dyslipidaemia while, older patients had hypertension and diabetes mellitus as major risk factors.

Atypical chest pain was seen in 5 patients of women group (9%) and was not seen in any men.

In this study, NSTEMI accounted for 36.8% followed by anterior wall infarction (31.5%) in males. Among females, unstable angina (32.7%) was more common, followed by NSTEMI (27.2%) and inferior wall infarction (16.3%). No significant age-related ECG changes was observed.

In this study, 12.3% of men and 16.3% of women had complications. However, complications among men and women were not statistically significant in this study.

Among 55 women group, six (11%) died during the hospital stay and is statistically significant, in which four among them were in the age group of 51-60 years, whereas only one patient (1.8%) who was 40 years old had died among men during the hospital stay and this was comparable with other studies in which mortality rates in men were lesser than women.<sup>8,10,11</sup>

The limitation of this study was low sample size and demonstrating the severity and outcome of Acute coronary syndrome with each risk factor separately in women with age matched men would be more informative, but less sample size made it difficult to do so.

## CONCLUSION

Atypical presentation of ACS was more common in females. ACS is more common in post-menopausal women. Apart from post-menopausal state, hypertension, dyslipidaemia and diabetes mellitus were common among women whereas smoking and hypertension were common among men with ACS. Women with acute coronary syndrome had higher complications and higher in hospital mortality compared to men. There is a need to create awareness on risk factor control and lower threshold for diagnosis and early intervention of CAD among women. A multicentre study with large sample size may be needed to design a specific protocol for the management of ACS in women.

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## REFERENCES

1. Nag T, Ghosh A. Cardiovascular disease risk factors in Asian Indian population: a systematic review. *J Cardiovascular Dis Res.* 2013;4(4):222-8.
2. Laslett LJ, Alagona P, Clark BA, Drozda JP, Saldivar F, Wilson SR, et al. The worldwide environment of cardiovascular disease: prevalence, diagnosis, therapy, and policy issues: a report from the American College of Cardiology. *J Am Coll Cardiol.* 2012;60:S1-49.
3. Mehta SR, Bassand J-P, Chrolavicius S, Diaz R, Fox KAA, Granger CB, et al. Design and rationale of CURRENT-OASIS 7: A randomized, 2×2 factorial trial evaluating optimal dosing strategies for clopidogrel and aspirin in patients with ST and non-ST-elevation acute coronary syndromes managed with an early invasive strategy. *Am Heart J.* 2008;156(6):1080-88.
4. Pahlajani DB. Myocardial infarction. In: Shah SN. *API textbook of medicine.* 7th ed. The association of physicians of India, Mumbai; 2006: 441-446.
5. Krishnegowda C, Swamy MH. Clinical, echocardiographic and angiographic correlation of acute coronary syndrome in women at a tertiary care centre. *Int J Res Med Sci.* 2017 Jan 3;4(7):2684–91.
6. Chatterjee SS, Banerjee A, Dutta S, Guha S, Mazumder B, Sanyal R, et al. Risk factors of myocardial infarction in Indian women. *Ind Heart J.* 1987;39(6):57.
7. Dave TH, Wasir HS, Prabhakaran D, Dev V, Das G, Rajani M, et al. Profile of coronary artery disease in Indian women: correlation of clinical, non-invasive and coronary angiographic findings. *Ind Heart J.* 1991;43(1):25-9.
8. Stone GW, Grines CL, Browne KF, Marco J, Rothbaum D, O'Keefe J, et al. Comparison of in-hospital outcome in men versus women treated by either thrombolytic therapy or primary coronary angioplasty for acute myocardial infarction. *Am J Cardiol.* 1995;75(15):987-92.
9. Santos VA, Latha PS, Neelum AT, Milan G, Abha K, Aruna KV, et al. Atherosclerotic cardiovascular disease in south asians in the united states: epidemiology, risk factors, and treatments: a scientific statement from the American heart association. *Circulation.* 2018;138(1):e1-34.
10. Čulić V, Eterović D, Mirić D, Silić N. Symptom presentation of acute myocardial infarction: influence of sex, age, and risk factors. *Am Heart J.* 2002;144(6):1012-7.
11. Hochman JS, Tamis JE, Thompson TD, Weaver WD, White HD, Van de Werf F, et al. Sex, clinical presentation, and outcome in patients with acute coronary syndromes. *New England J Med.* 1999;341(4):226-32.

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