

## Original Research Article

# A study of acute coronary syndrome in post-menopausal women

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### ABSTRACT

**Background:** Ischemic heart disease (IHD) is the most common, serious, chronic, life-threatening illness. Account for around half of the global burden from these conditions, i.e. around 17.9 million lives each year, 2020 WHO. Although many factors can influence an individual's risk for coronary artery disease (CAD), some factors are unique to women, including reproductive status. Menopause is associated with significant elevations in serum cholesterol levels and a threefold increase in risk of CAD. It has been suggested that these changes result from a reduction in the level of estrogen. One in every two women will die of heart disease and stroke, compared with only 1 in 28 who will die of breast cancer. Contrary to the belief that CAD is a man's disease. So, this study was undertaken to study the risk factors, clinical profile and Complications (in hospital) of Acute coronary syndrome in post-menopausal women.

**Methods:** An observational study conducted in 100 patients with post-menopausal women admitted in Basaveshwar hospital, Kalaburgi, for a period of 6 months. Study subjects selected after applying inclusion and exclusion criteria.

**Results:** 100 post-menopausal women, 80% were above 50 years, mean age was 59.05 years ( $\pm 9.97$  years). The following risk factors were noted, Hypertension (52%), diabetes (36%), obesity (20%), dyslipidaemia (10%), family history of IHD. Chest pain was the most common presenting complaint in 92%. 39% of the patients were admitted after 12 hours of onset of chest pain.

**Conclusion:** Acute myocardial infarction (MI) is common in post-menopausal women and they generally present late. Because of the late presentation, the beneficial effects of thrombolytic therapy are denied.

**Keywords:** Acute coronary syndrome, CAD, Post-menopausal women

### INTRODUCTION

Acute MI is an event of myocardial necrosis caused by an unstable ischemic syndrome.<sup>1</sup> It is the sudden or acute development of localized or circumscribed area of myocardial necrosis due to severe ischemia from inadequate blood flow and or oxygenation.<sup>2</sup> MI is a pathological process but a clinical entity.<sup>3</sup>

One sixth of the world's population lives in India with 72% of the approximately 1 billion people residing in rural areas. Cardiovascular diseases (CHD) account for 24% of total deaths, and are higher in urban than rural areas.<sup>4</sup> In 2003, the prevalence of CHD in India was

estimated to be 3-4 percent in rural areas (two-fold higher compared with 40 year ago) and 8-10% in urban areas (six-fold higher compared with 40 years ago), with a total of 29.8 million affected (14.1 million in urban areas, and 15.7 million in rural areas) according to population-based cross-sectional surveys.<sup>5</sup>

Although many factors can influence an individual's risk for CAD, some factors are unique to women, including reproductive status. Menopause is associated with significant elevations in serum cholesterol levels and a threefold increase in risk of CAD. It has been suggested that these changes result from a reduction in the level of estrogen.<sup>6</sup> One in every two women will die of heart

disease and stroke, compared with only 1 in 28 who will die of breast cancer.<sup>6</sup> Contrary to the belief that CAD is a man's disease; CAD is also a leading cause of death and disability among older women.<sup>7</sup> Estimates of the percentage of women with IHD who were disabled by their illness in 1980 ranged from 36% in women aged 55-64 years to 55% in women aged 75 years and older.<sup>8</sup> 40% of all coronary events in women are fatal, 67% of all sudden deaths in women occur in those without a history of CAD.<sup>8</sup>

The American heart association (AHA) survey showed that most women are under the impression that breast cancer is their primary health concern, many of them do not know their risk of CAD. Although there are many similarities, women differ from men in both disease presentation and prognosis following CAD. Because of the atypical presentation the diagnosis in women may be delayed potentially causing further harm.<sup>9</sup>

Information on the extent of CAD in post-menopausal women has gained considerable interest, however no data available in India.<sup>10</sup> The profile of acute MI in women has not been studied in depth in the country. Habits, cultural and dietary pattern of Indian women vary from their western counterparts.<sup>11</sup> Studies of acute MI based primarily on men, and conclusions drawn from these studies may not be applicable to women.<sup>12</sup> Although CAD occurs about a decade later in women than in men and these infrequent in premenopausal women, women with overt CAD have multiple risk factors.<sup>13</sup> Atypical presentations have a worst prognosis than do men.<sup>14</sup> They have increased morbidity and mortality; even surgical and non-surgical revascularization procedures are also less successful than men.<sup>15</sup> Because of average life expectancy extends 20-30 years after menopause (one third of life span) the medical and economic impacts of these changes are significant.<sup>16</sup> Hypertension and diabetes mellitus are the two major risk factors for CAD in women. Atypical presentation in women with vague and more generalized complaints makes it more difficult to diagnose CAD.<sup>17</sup>

So, this study was undertaken to know the clinical profile, risk factors and prognosis in postmenopausal women developing acute MI.

**METHODS**

This was the observational study, carried out with 100 post-menopausal females with acute coronary syndrome, admitted in Basaveshwar teaching and general hospital from November 2019 to April 2020.

Inclusion criteria for this study- postmenopausal women diagnosed with acute coronary syndromes as per the below given diagnostic criteria. Exclusion criteria excluded patients with chronic stable angina, CHD resembling ACS like pericarditis, aortic dissection and pulmonary embolism, Non-cardiac causes of chest pain,

Premenopausal women, Post-menopausal women on hormone replacement therapy and Surgical menopause women.

Diagnostic criteria included ECG changes in which new or presumably new Q waves (at least 30 ms wide and 0.20 mV deep) in at least two leads from any of the following: Leads II, III, or aVF, Leads V<sub>1</sub> through V<sub>6</sub>, Leads I and aVL, Hyperacute tall T wave or inverted symmetrical T waves, Persistent ST segment elevation >0.10 mV in limb leads or >0.2 mV in chest leads measured 0.02 s after the J point in two contiguous leads of the previously mentioned lead combination.

A detailed history was taken in all the patients and a thorough physical examination was done as per the proforma. Patients were kept in ICU for 2-3 days provided no other complications were present. From ICU they were transferred to cardiac ward and discharged after 1-2 weeks.

The other investigations to which patients were subjected are- Troponin T, Serum creatinine, Blood routine (Hb%, TC), Urine routine, Lipid profile, Blood urea, LDH, RBS.

Statistical analysis of the study carried out by data entered in MS Excel and analysed in SPSS V2.2 Descriptive statistics were applied. Quantitative data were represented in the form of frequencies and percentages.

Killip's classification based on physical findings at the time of admission, patients were grouped into<sup>-22</sup>

Class I - Absence of crepitations over lung fields and absence of third heart sound.

Class II - Crepitations over 50% or less over the lung fields or presence of third heart sound

Class III - Crepitations over more than 50% of lung fields (pulmonary oedema).

Class IV -Cardiogenic shock.

**RESULTS**

The age of patients in this study varied from 44 to 85 years. Mean age was 59.05 years (±9.97 years). Peak incidence occurred in the age group 50 to 59 years.

**Table 1: Age distribution.**

Age (year)	Frequency	Percentage (%)
<50	20	20.0
51-60	40	40.0
61-70	26	26.0
71-80	12	12.0
81-90	2	2.0
<b>Total</b>	100	100.0

**Table 2: Post-menopausal period.**

PMP	Frequency	Percentage (%)
≤5	13	13.0
6-10	27	27.0
11-15	28	28.0
16-20	13	13.0
21-25	5	5.0
>25	14	14.0
<b>Total</b>	<b>100</b>	<b>100.0</b>

13% of the patients presented <5 years after menopause, 27% presented 6-10 years after menopause, 28% presented 11-15 years after menopause, 13% presented 16-20 years after menopause and 14% presented after >25 years after menopause. None of them were on HRT/ERT and none of the patients had premature menopause

**Table 3: Occupation of the patient.**

Occupation	Frequency	Percentage (%)
<b>Fruit vendor (FV)</b>	2	2.0
<b>Home worker (HW)</b>	96	96.0
<b>Maid servant</b>	2	2.0
<b>Total</b>	<b>100</b>	<b>100.0</b>

Occupation of the 50 patients studied, 48 were housewives, 1 was a maid servant and 1 was a fruit vendor. Because of their advanced age majority of the housewives were sedentary and did not involve themselves in household chores.

**Table 4: Level of physical activity among the patients.**

Physical activity	Frequency	Percentage (%)
<b>Light</b>	96	96.0
<b>Medium</b>	4	4.0
<b>Total</b>	<b>100</b>	<b>100.0</b>

**Table 5: The coronary risk factors.**

Risk factors	Frequency	Percentage (%)
<b>Hypertension</b>	52	52.0
<b>Diabetes</b>	36	36.0
<b>Obesity</b>	20	20.0
<b>Dyslipidaemia</b>	10	10.0
<b>Family history</b>	8	8.0
<b>Tobacco use</b>	2	2.0

History of previous illness was noted in 100% of patients. They included hypertension (52%) diabetes (36%), IHD (20%), CVA (2%) and these patients were on irregular treatment. None of the patients were receiving primary prophylaxis either in the form of aspirin, clopidogrel, beta-blockers, statins and none of the patients consumed alcohol.

**Table 6: Diseases (pre-existing) on admission prevalence of pre-infarction characteristics.**

Diseases	Frequency	Percentage (%)
<b>Hypertension</b>	52	52.0
<b>Diabetes mellitus</b>	36	36.0
<b>IHD</b>	20	20.0
<b>CVA</b>	2	2.0

**Table 7: Symptoms at the time of admission clinical presentation.**

Symptoms	Frequency	Percentage (%)
<b>Chest pain</b>	92	92.0
<b>Sweating</b>	85	85.0
<b>Anxiety/nervousness</b>	31	31.0
<b>Breathlessness</b>	29	29.0
<b>Nausea/vomiting</b>	29	29.0
<b>Left arm/shoulder pain</b>	25	25.0
<b>Dizziness</b>	17	17.0
<b>Abdominal discomfort</b>	9	9.0
<b>Neck pain</b>	8	8.0
<b>Palpitations</b>	8	8.0
<b>Backache</b>	6	6.0
<b>Jaw pain</b>	6	6.0

Chest pain was the most common symptom and was present in 92%, it was described as squeezing, constricting, pressing or dull aching, radiation of chest.

**Table 8: Site and type of infarction.**

Site of Infraction	Frequency	Percentage (%)
<b>Anterior wall</b>	48	48.0
<b>Inferior wall</b>	26	26.0
<b>NQWMI</b>	20	20.0
<b>Anterior and inferior</b>	6	6.0

Non-Q wave myocardial infarction (NQWMI) was present in 20% of patients. QWMI was diagnosed in 80% and formed by anterior wall infarction in 48%, inferior wall infarction in 26%, 6% of patients had combined anterior wall and inferior wall infarction.

## DISCUSSION

Hundred post-menopausal women admitted to Basaveshwar teaching and general hospital from November 2019 to April 2020 were selected for this study. Patients were studied with special reference to clinical profile at admission, risk factors for MI, and in hospital course.

### Incidence

Total number of patients admitted with acute MI during the study period were 530. Out of 530, 143 were women

and constituted 26.98% of the cases of acute MI. Among them 126 women were post-menopausal and constituted 88.11%, and 17 were pre-menopausal. Out of 126 post-menopausal women 100 were included in this study.

Yavagal et al reported that post-menopausal women constituted 80% of their study group.<sup>11</sup> Dave et al observed that 84% of the women in their study were post-menopausal.<sup>17</sup> In the study by Chatterjee et al 97.7% were post-menopausal.<sup>10</sup> This shows that there is a sharp increase in acute MI in post-menopausal women.

**Socio-economic status**

The highest number of patients (94%) in the present study were from lower socio-economic category. This is not in conformity with other studies, as this hospital caters mainly for the people of lower socio-economic group and there is unequal representation of the middle and upper socio-economic group.

**Physical activity**

96% of patients in the present study group were sedentary due to their advanced age. This was similar to the observations of Singh et al (96%).<sup>18</sup>

**Risk factors regard to coronary risk factors (%)**

Hypertension was the commonest risk factor (52%) in this study and it is comparable with the findings of Yavagal et al (49%), Dave et al (53%), Milner et al (63%), Stone et al (54%).<sup>11,17,19,20</sup> Diabetes mellitus was the next common risk factor found in 36% of patients and is consistent with the findings of Yavagal et al (34%), Dave et al (44%), Milner et al (38%), obesity was detected in 20%.<sup>11,17,19</sup> In the present study and it is similar to the observations of Yavagal et al (18%).<sup>11</sup> Studies by Dave et al, Chatterjee et al Milner et al, have observed obesity in 58%, 4%, 60%, 46.9% and 54% respectively.<sup>10,16,19</sup> This may be due to the lower socio-economic groups of the present study and the higher socio-economic groups in the other studies. Dyslipidaemia was present in 10% of patients in the present study and it correlated with the findings of Yavagal et al 8.4%.<sup>11</sup> In the studies by Chatterjee et al it was 25% and in Milner et al (33%), Stone et al (30%).<sup>10,19,20</sup> This may be because of the dietary habit. Average fat consumption between the different populations varies. Family history of MI was present in 8% of patients in the present study and is comparable with the studies by Yavagal et al (9.3%), Chatterjee et al (7%).<sup>11,10</sup>

At the time of admission, some of the patients had been diagnosed previously to have certain risk factors. It included hypertension in 52%, Yavagal et al and Greenland et al have reported it in 38.4% and 50% respectively.<sup>11,21</sup> Diabetes was present in 36%. This was comparable with the studies by Yavagal et al (25.6%) and

Greenland et al (29%).<sup>11,21</sup> Pre-existing IHD was present in 20%, Yavagal et al and Greenland et al have reported it in 33.2% and 18.5% respectively.<sup>11,21</sup> Previous CVA was present in one patient (2%). Yavagal et al have reported it in 3.2% of cases.<sup>11</sup>

**Table 9: Diseases (pre-existing) on admission (%).**

Diseases	Yavagal et al <sup>11</sup>	Greenland et al <sup>21</sup>	Present study
<b>Hypertension</b>	38.4	50	52
<b>Diabetes</b>	25.6	29	26
<b>Pre-existing IHD</b>	33.2	18.5	20
<b>Previous CVA</b>	3.2	-	2

**Table 10: Symptoms of MI in various studies (%).**

Symptoms	Milnre et al <sup>19</sup>	Yavagal et al <sup>11</sup>	Present study
<b>Chest pain</b>	70	94	92
<b>Sweating</b>	30	87.2	85
<b>Anxiety/nervousness</b>	-	34	31
<b>Breathlessness</b>	50	27.2	29
<b>Nausea/vomiting</b>	30	28	29
<b>Dizziness</b>	21	-	17
<b>Abdominal discomfort</b>	22	-	9
<b>Bach ache</b>	13	-	6

Chest pain was the commonest symptom (92%) of acute MI in the present study, which is in accordance with the observations of Yavagal et al (94%).<sup>11</sup> In addition to chest pain, other symptoms were observed like, sweating (85%), anxiety/nervousness (31%), breathlessness (29%), nausea/vomiting (29%), left arm/shoulder pain (25%) and palpitations (8%). This was similar to the observations of Yavagal et al.<sup>11</sup> Atypical symptoms were noted like dizziness (17%), abdominal discomfort (9%), neck pain (8%), backache (6%) and jaw pam (6%).

Milner et al have made similar observations of atypical symptoms like dizziness (21%), abdominal discomfort (22%) and backache (13%) in their study.<sup>19</sup>

**CONCLUSION**

Acute MI is common in post-menopausal women and they generally present late. Because of the late presentation, the beneficial effects of thrombolytic therapy are denied. In this study group, in addition to advanced age and post-menopausal state multiple risk factors are common in the form of hypertension, diabetes mellitus, obesity, physical inactivity. In post-menopausal women, mortality is higher among diabetics. The mortality rate increased with increasing age in post-menopausal women. Identification and reduction of risk factors is an important step in prevention of morbidity and mortality of MI in post-menopausal women.

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