

Original Article

Clinical Presentation & Dyslipidemia in Post-Menopausal Women with Acute Myocardial Infarction

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ABSTRACT

Introduction: While most CHD risk factors are similar between men and women, they can often vary in strength and association and change throughout their lifetime. This is especially evident for lipids, with low high-density lipoprotein cholesterol (HDL-C) cholesterol and hypertriglyceridemia being stronger predictors of CHD in women than in men. **Aim of the study:** This study aimed to analyze the clinical presentation and dyslipidemia in postmenopausal women with acute myocardial infarction. **Methods and materials:** This cross-sectional descriptive study was carried out at the Department of Medicine and Department of Cardiology, Sher-E-Bangla Medical College Hospital, Barisal, Bangladesh, from January 2019 to July 2019. A total of 105 postmenopausal women with acute myocardial infarction (AMI) were selected purposively. Data entry and descriptive analysis were done using SPSS (Statistical Package for Social Science) for Windows

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version 20.0. Output of data and graphical representation was done using Microsoft Office chart and Microsoft Word. **Result:** On ECG, arrhythmia was seen in 34.28% of subjects. Ischemia was observed in 30.47% subjects. Old MI (15.23%) was also evident in ECG. A majority (36.19%) of the subjects had <41-50% LV dysfunction. Only 12.38% had $\geq 56\%$ LV function on echocardiography. The serum cholesterol of the study subjects was ranged. from 112 mg/dl to 325mg/dl. The mean \pm SD cholesterol level was 197.8 ± 55.1 mg/dl. Mean (\pm SD) triglyceride, HDL, and LDL levels were 259.0 (+91.5) mg/dl, 39.2 (± 6.6) mg/dl and. 147.5 (+46.45) mg/dl respectively. Dyslipidemia was present in 91(86.67%) subjects. **Conclusion:** Majority of the post-menopausal women with acute myocardial infarction present with chest pain and dyspnea. They had raised cholesterol and triglyceride levels. This study concludes that post-menopausal women should pay early attention to their abnormal lipid profile to prevent ischemic heart disease.

Keywords: Post-menopausal, Dyslipidemia, Acute myocardial infarction, Ischemia

INTRODUCTION

The term Myocardial infarction (MI) is used when the irreversible necrosis of heart muscle occurs secondary to prolonged ischemia. Ischemia occurs due to plaque erosion/rupture, fissuring, dissection, coronary spasm, embolism, anemia, arrhythmias, hypertension, or hypotension. Approximately 1.5 million cases of MI occur annually in the United States [1]. Chest pain is the most common symptom of acute MI and is often described as a sensation of tightness, pressure, or squeezing. Chest pain due to ischemia (a lack of blood and hence oxygen supply) of the heart muscle is termed angina. The onset of symptoms in myocardial infarction (MI) is usually gradual, over several minutes, and rarely instantaneous [1,2]. The onset of symptoms in myocardial infarction is usually gradual, over several minutes, and rarely instantaneous [3,4]. Chest pain is the most common symptom of acute MI and is often described as a sensation of tightness, pressure, or squeezing. Shortness of breath occurs when the damage to the heart limits the output of the left ventricle, causing left ventricular failure and consequent pulmonary edema. Other symptoms

include diaphoresis (an excessive form of sweating), weakness, light-headedness, nausea, vomiting, and palpitations [5]. These symptoms are likely induced by a massive surge of catecholamine from the sympathetic nervous system [6,7]. Women often lag behind men in their risk of cardiovascular events. However, with age and the onset of menopause, women's cardiovascular risk eventually becomes similar to that of men. This change in risk may, in part, be attributable to a shift to a more atherogenic lipid profile [8]. Coronary heart disease (CHD) is the leading cause of death among men and women, although the risk in women temporally lags behind that of men. Nevertheless, the median survival for a woman aged 55 to 64 with a first myocardial infarction (MI) is only 13.3 years compared to 17 years for a man [9]. Furthermore, for women aged 65 to 74, this median survival decreases to only 8.8 years. Also, 64% of women who die suddenly of CHD have no previous symptoms compared to 50% of men. While most CHD risk factors are similar between men and women, they can often vary in strength and association and change throughout the lifetime [9,10]. This is especially evident for lipids, with low

high-density lipoprotein cholesterol (HDL-C) cholesterol and hypertriglyceridemia being stronger predictors of CHD in women than in men [11, 12]. Also, with age and the onset of menopause, women's lipoprotein profile becomes more atherogenic, which is associated with a rapid increase in cardiovascular risk. However, how to best quantify cardiovascular risk in women incorporating lipid parameters is unclear [13]. While low-density lipoprotein cholesterol (LDL-C), an atherogenic lipoprotein, has been recognized as the target of lipid-lowering therapy, it is not always indicative of atherogenicity [2,3]. Other lipoprotein parameters (i.e., remnant lipoproteins) are more atherogenic, particularly in women, including apolipoprotein (apo) B, intermediate-density lipoprotein cholesterol (IDL-C), and subfractions of very low-density lipoprotein cholesterol (VLDL-C). In addition, the triglyceride to HDL-C ratio (TG/HDL-C) is an atherogenic marker and a powerful independent predictor of all-cause mortality and cardiovascular events among postmenopausal women [12]. This study aimed to assess the clinical presentation and dyslipidemia in postmenopausal women with acute myocardial infarction.

OBJECTIVE

General Objective

- To identify the clinical presentation of MI
- To observe the pattern of lipid profile in postmenopausal women with acute myocardial infarction

Specific Objectives

- To know the age distribution of

the study objects

- To elucidate common ECG, Echocardiographic findings of the study subjects

METHODS & MATERIALS

This cross-sectional descriptive study was carried out at the Department of Medicine and Department of Cardiology, Sher-E-Bangla Medical College Hospital, Barisal, Bangladesh, from January 2019 to July 2019. Post-menopausal women with acute MI admitted to the medicine and cardiology department were considered as study population.. A total of 105 postmenopausal women with acute myocardial infarction (AMI) were selected purposively as per inclusion and exclusion criteria.

Inclusion Criteria

- Post-menopausal women with AMI.
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients taking lipid-lowering agents.
- Patients of hypothyroidism and nephrotic syndrome.
- Patients who achieved surgical menopause.
- Patients who did not give consent to participate in the study.

Informed written consent was taken from all the patients after informing the necessary information regarding the research study. Then data were collected in a pre-designed structured data collection sheet. Data were collected from primary sources starting from the clinical history to

laboratory investigations. Collected data were compiled on a master chart and then organized by using scientific calculated and standard statistical formulas, percentage was calculated to find out the proportion of the findings. Data entry and descriptive analysis were done using SPSS (Statistical Package for Social Science) for Windows version 20.0. Output of data and graphical representation was done using Microsoft Office chart and Microsoft Word. The results were presented in tables and diagrams. Ethical clearance was obtained from the ethical review board of Sher-E-Bangla Medical College Hospital, Barisal.

RESULTS

Table I: Age distribution of the study respondents (N=105)

Age group (Years)	n	%
49 and below	15	14.28
50-59	37	35.23
60-69	28	26.66
70 and above	25	23.80
Mean± SD	61.75±9.50	
Age range	45-80	

The mean age was 61.75±9.50years range from 45-80 years. A majority (35.23%) of the respondents were found in the age group of 50-59. 26.66% of subjects were found in the 60-69 years age group. [Table I]

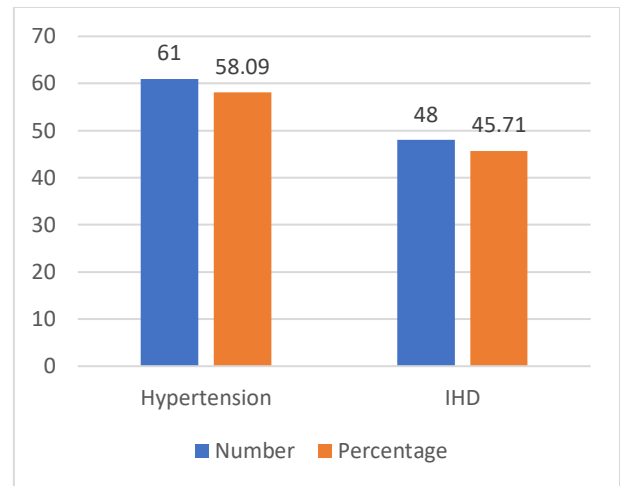


Figure 1: Bar diagram showing pre-existing risk factors of the study subjects (N=105)

In this series, 61 subjects (58.09%) were hypertensive and 48 subjects (45.71%) had IHD. [Figure 1]

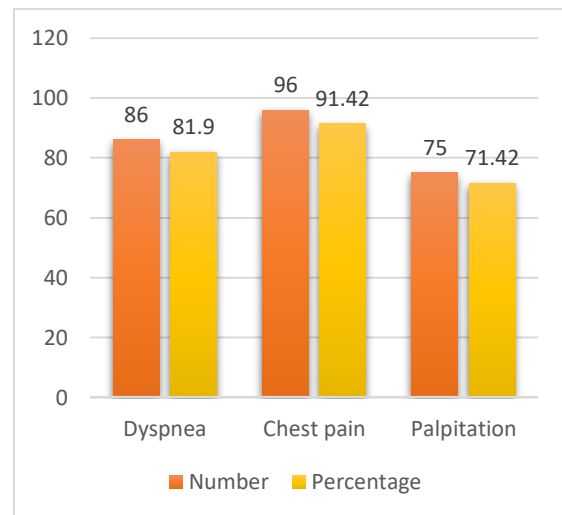


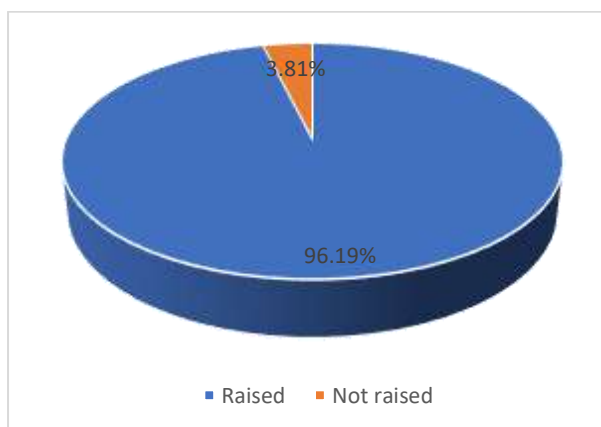
Figure 2: Bar diagram showing symptoms of the study subjects (N=105)

It was observed that chest pain was present in 91.42% of subjects. About 81.90% was dyspneic and 71.42% had palpitation. [Figure 2]

Table II: Signs of the study subjects (N=105)

Signs	n	%
Presence of edema	68	64.76
Presence of raised JVP	38	36.19
Crepitations in lung		
Bilateral Basal zone	42	40.00
Basal and mid-zones	35	33.33
Whole lung	16	15.23

In this study, about 64.76% of subjects had edema and 36.19% had raised JVP. Bilateral basal crepitation was observed in most (40.00%) of the subjects. [Table II]

**Figure 3: Distribution of respondents according to troponin I level (N=105)**

Among 105 subjects Troponin I level is raised in 101 (96.19%) patients. [Figure 3]

Table III: ECG findings of the study subjects (N=105)

ECG findings	n	%
AMI	105	100.0
Arrhythmia	36	34.28
Ischemia	32	30.47
Old MI	16	15.23

It was observed that arrhythmia was seen in 34.28% of subjects, ischemia in 30.47% of subjects, and old MI (15.23%) was evident in ECG. [Table III]

Table IV: Common Echocardiographic findings of the study subjects (N=105)

ECHO findings (Common)	n	%
Regional wall motion abnormality	105	100
LV function		
Normal $\geq 56\%$	13	12.38
LV dysfunction		
Fair $\leq 51-55\%$	22	20.95
Mild $\leq 41-50\%$	38	36.19
Moderate $\leq 31-40\%$	16	15.23
Severe $\leq 30\%$	16	15.23

The most common ECHO findings of the subjects were regional wall motion abnormalities (100%). A majority (36.19%) of the subjects had $\leq 41-50\%$ LV dysfunction. Only 12.38% had $\geq 56\%$ LV dysfunction. [Table IV]

Table V: Lipidemic status of the study subjects (N=105)

Lipidemic	Mean \pm SD	Minimum-
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status		Maximum
Cholesterol (mg/dl)	197±55.1	112-325
Triglyceride (mg/dl)	259.0±91.5	140-420
HDL (mg/dl)	39.2±6.6	20-55
LDL (mg/dl)	147.5±46.45	85-234

The cholesterol of the study subjects ranged from 112 mg/dl to 325 mg/dl. The mean \pm SD cholesterol level was 197.8±55.1 mg/dl. Mean (\pm SD) triglyceride, HDL, and LDL levels were 259.0 (91.5) mg/dl, 39.2(\pm 6.6) mg/dl, and 147.5 (\pm 46.45) mg/dl respectively. [Table V]

DISCUSSION

As the study was concerned with post-menopausal women the mean mean age was 61.36±13.18 years ranging from 45 to 80 years. The majority (38.85%) of the respondents were found in the age group of 50-59. Several studies revealed risk factors of AMI Older age (older than 45 for men and older than 55 for women), High blood pressure, High blood cholesterol, Cigarette smoking, Lack of physical activity, Type 2 diabetes, and Family history of chest pain, heart disease, or stroke. Similar findings were observed in the present study where the majority of the post-menopausal women [61 (58.09%)] subjects were hypertensive. They also had a history of IHD [48(45.71%)] as a risk factor for developing AMI [14-16]. Researchers reported that the cardinal sign of decreased blood flow to the heart was chest pain experienced as tightness around the chest and radiating to the left arm and the left angle of the jaw. This was associated with

shortness of breath. Some reported palpitations, anxiety, or a sense of impending doom and a feeling of being acutely ill. In the current study, it was seen that dyspnea was present in 81.90% of subjects. About 91.42% had chest pain and 71.42% had palpitation. About 64.76% of subjects had edema and 36.19% had raised JVP. Bilateral basal crepitation was observed in most (78.09%) of the subjects [17]. Acute MI causes myocardial damage and release of several biochemical markers; the most common is Troponin I. ECG shows signs of ischemia and signs of complications related to AMI. In the present study, the raised Troponin I level is 96.19%. On ECG, arrhythmia was seen in 34.28% of subjects. Ischemia was observed in 30.47% subjects. Old MI (15.23%) was also evident in ECG. A majority (36.19%) of the subjects had <41-50% LV dysfunction. Only 12.38% had \geq 56% LV dysfunction on Echocardiography. At menopause ovary ceases its function. So, the production of estrogen is decreased and it changes the vascular permeability by increasing nitrous oxide production. Nitrous oxide maintains a healthy lipoprotein profile stabilizes the endothelial cells, enhances the antioxidant effect, and alters fibrinolysis protein. All these cardioprotective mechanisms are lost in menopause due to decreased estrogen and subsequent nitrous oxide production. So, menopause leads to changes in lipid profile by reducing HDL, and elevating Total Cholesterol (TC), triglycerides (TG), LDL-cholesterol, and VLDL-cholesterol, thus increasing the risk for cardiovascular disease in post-menopausal women [18]. In the current study serum cholesterol of the menopausal subjects with acute myocardial infarction ranged from 112 mg/dl to 325mg/dl. The mean \pm SD

cholesterol level was 197.8 ± 55.1 mg/dl. Mean (\pm SD) triglyceride, HDL, and LDL levels were $259.0 (\pm 91.5)$ mg/dl, $39.2 (+6.6)$ mg/dl and $147.5 (+46.45)$ mg/dl respectively. 91(86.67%) subjects had dyslipidemia, most of them were hypertriglyceridemic. A recent study (2013) in Bangladesh revealed menopause led to changes in lipid profile by increasing total and LDL cholesterol and by reducing HDL cholesterol. The elevated LDL and the reduction of cardioprotective HDL was an indication that menopause is an independent risk factor for developing cardiovascular disease in Bangladesh. In another comparable study, it was seen the increased level low density lipoprotein and decreased HDL in menopausal women^[11]. In a comparative study, Researchers revealed a statistically significant increase in total cholesterol ($p < 0.0001$) with age and also a statistically significant increase in TG ($p < 0.0001$), VLDL ($p < 0.0001$) and LDL ($p < 0.0001$) were observed between reproductive and postmenopausal women^[13]. Similar findings were also found in other studies^[19,20].

LIMITATIONS OF THE STUDY

The study was conducted in a single hospital with a small sample size for a short duration. So, the results may not represent the whole community.

CONCLUSION

The majority of the post-menopausal women with acute myocardial infarction present with chest pain and dyspnea. They have raised cholesterol and triglyceride levels. So, this study concludes that post-menopausal women should pay early

attention to their abnormal lipid profile to prevent ischemic heart disease.

FUNDING

No funding sources

CONFLICT OF INTEREST

None declared

ETHICAL APPROVAL

The study was approved by the Institutional Ethics Committee

RECOMMENDATION

Postmenopausal women are at risk of cardiovascular disease (CVD). The presence of abdominal obesity, dyslipidemia, and hypertension, may further aggravate the CVD risk imposed by menopause. So, For the post-menopausal woman, screening and risk assessment for CVD and proper management of the modifiable risk factors will improve health and quality of life. Moreover, further studies with a comparative prospective design are recommended on this present issue involving a large sample size and multiple centers.

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