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Original Research Article

Segment Elevation Myocardial Infarction (STEMI) in Postmenopausal Women: A Prospective Research on Different Risk Factors.

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Abstract

Introduction: This study aims to investigate the unique aspects of acute coronary syndrome (ACS) in post-menopausal women (PMW) compared to age-matched men, focusing on ethnic representation. By isolating the impact of estrogen, we aim to provide insights into ACS presentation and outcomes in this demographic.

Methods: A cross-sectional study conducted at GSL Medical College, Rajahmundry from January 2021 to June 2022. Approved by the Institutional Ethics Committee, it included post-menopausal women with STEMI. Comprehensive assessments, including clinical exams and investigations, were conducted. Statistical analysis was performed using SPSS and Excel, with significance set at $p<0.05$.

Results: Among 76 participants, mean age was 59.91±11.25 years, with 28.9% aged 51-60. Smoking (54%) was prevalent, followed by alcohol (45%) and tobacco (8%) use. Most (40%) were obese. 34.2% showed no regional wall abnormality, 17.1% had global hypokinesia. Coronary angiogram results varied, with no significant CA-BMI correlation.

Conclusion: The study underscores the multifactorial nature of ACS in PMW, implicating age, lifestyle factors like smoking and alcohol consumption, and obesity as significant contributors to ACS risk. Moreover, cardiac pathology diversity revealed by coronary angiograms highlights the importance of tailored management approaches for optimal ACS outcome.

Key words: Age, smoking, obesity, coronary angiogram, left ventricle hypokinesia

Introduction

Acute coronary syndrome (ACS) manifests uniquely in women compared to men, exhibiting notable distinctions in risk factors, clinical presentation, and outcomes. Women typically present with ACS at a later age and often display atypical symptoms, leading to delays in seeking medical attention. [1] This delay contributes to increased morbidity and mortality rates among women with ACS. Moreover, women are more prone to certain complications associated with ACS. These gender-specific differences underscore the importance of recognizing and addressing the unique aspects of ACS in women, emphasizing the need for tailored diagnostic and treatment strategies to improve outcomes and reduce the disparities in care. [2]

Previous comparative studies on ACS have often overlooked the distinction between pre- and post-menopausal women (PMW) and lacked representation of Indian/South Indian ethnicities. [3] Additionally, these studies have typically involved a greater number of men, leading to skewed comparisons. Furthermore, the older age of women in these studies has posed a significant confounding factor. Given the pivotal role of estrogen in ACS gender differences, we focused exclusively on PMW compared to age-matched men. This approach aimed to isolate the impact of estrogen and provide a more nuanced understanding of ACS presentation and outcomes in this specific demographic. By narrowing the scope to PMW and ensuring ethnic representation, our study seeks to fill a crucial gap in the literature and offer insights into the unique aspects of ACS in this population.

Methods

It was a cross-sectional study, conducted in the department of General Medicine, GSL Medical College, Rajahmundry. Study was conducted between January 2021 to June 2022. Study protocol was approved by the Institutional Ethics Committee. Informed written consent was taken from the study members.

Inclusion criteria comprised female patients who had attained menopause and were admitted with clinical features and ECG findings indicative of ST-elevation myocardial infarction (STEMI). Exclusion criteria included female patients with stable angina, unstable angina, or non-ST-elevation myocardial infarction (NSTEMI). Additionally, female patients with ST elevation lacking both symptoms and enzyme elevation and non-cooperative ones were excluded.

A comprehensive history and clinical examination were conducted for each study participant using a predefined questionnaire. Vital parameters and comorbidities were meticulously recorded, including height, weight, and Body Mass Index (BMI). Experienced cardiologists performed detailed examinations, and investigations such as complete blood picture, renal function tests, and fasting lipid profiles were conducted. Coronary angiograms (CAs) were also performed to assess cardiac health. Subjects received thrombolytic therapy or percutaneous coronary intervention as deemed necessary. Prior to participation, written informed consent was obtained from all subjects, and approval from the institutional ethics review committee was secured. This ensured adherence to ethical standards and guidelines. The meticulous collection of data and adherence to ethical protocols facilitated the thorough evaluation of each participant's cardiac condition and ensured the integrity and validity of the study findings.

Statistical Analysis: All statistical analyses were conducted using SPSS software trial version 20.0 and MS Excel-2010. The Chi-square test was employed to evaluate associations among categorical variables. A p-value of <0.05 was deemed statistically significant, indicating meaningful associations between variables.

Results

Total 76 (100%) members were included in this study. The mean age of the study population was 59.91±11.25 years, maximum (28.9%; 22) were in 51 – 60 years group. Smoking was the leading (54%) addiction following by alcohol (45%) and tobacco (8%) consumption. Most (40) of the study members were obese. In this research, 34.2% showed no regional wall abnormality, while 17.1% exhibited global hypokinesia of the left ventricle. CA revealed that 25% (19) were normal, single vessel disease (25%), double vessel disease (19.7%) and triple vessel disease (19.7%). Statistically there was no significant difference between CA and BMI.

Discussion

The relationship between age and ACS in PMW is crucial in understanding the disease's dynamics. [5] As women age beyond menopause, their risk of ACS typically increases due to various factors. Age is a significant independent predictor of ACS in PMW, with advancing age correlating positively with a higher incidence of ACS events. [6] Physiological changes associated with aging, such as arterial stiffening, endothelial dysfunction, and increased prevalence of traditional cardiovascular risk factors like hypertension, dyslipidemia, and diabetes, contribute to this elevated risk. Moreover, age-related hormonal changes, particularly the decline in estrogen levels after menopause, play a role in the pathogenesis of ACS in PMW. Thus, understanding the interplay between age and ACS in PMW is essential for risk stratification, preventive strategies, and tailored management approaches to mitigate the burden of cardiovascular disease in this population. In this research the mean age of the study population was 59.91±11.25 years, maximum (28.9%; 22) were in 51 – 60 years group. Whereas it was mentioned in a study that the incidence was just 5.3% in 65 – 74 years and it was highest (13.5%) in 75 – 84 years. [7]

As per the literature, smoking, alcohol were considered to be the risk factors of myocardial infarction (MI) among the men compared to PMW. [8, 9] Whereas in this research, Smoking was the leading (54%) leading addiction followed by alcohol (45%) and tobacco (8%) consumption. One of the recent studies [10] form western world, 92% of PMW habituated to take alcohol and in this research the investigators included >79K study members; here the leading risk was cancer (48%) followed by MI (44%). The exact correlation between alcohol intake and MI was not reported. But the compounding as well as complimentary action of alcohol as well as smoking could lead to development of MI as well as ACS.

Obesity significantly correlates with an increased risk of ACS [11], 40% of this study members were found to be obese. Excess adiposity contributes to a systemic pro-inflammatory state, endothelial dysfunction, and metabolic abnormalities, culminating in atherosclerosis and plaque instability. Moreover, obesity exacerbates traditional cardiovascular risk factors like hypertension, dyslipidemia, and insulin resistance, further amplifying ACS susceptibility. Adipose tissue also secretes adipokines, promoting inflammation and thrombosis. Consequently, obese individuals face a heightened risk of ACS events, emphasizing the critical role of weight management

and lifestyle modifications in ACS prevention strategies. [2]

In this research, the distribution of regional wall abnormalities and findings from CA shed light on the spectrum of cardiac pathology among the study population. The prevalence of no regional wall abnormality in 34.2% of participants suggests a subgroup with relatively preserved left ventricular function. Contrastingly, the substantial proportion (17.1%) displaying global hypokinesia of the left ventricle indicates significant myocardial dysfunction, potentially indicative of widespread ischemia or cardiomyopathy. [12]

The CA findings further delineate the underlying coronary artery disease (CAD) burden. The 25% with normal CAs may represent individuals without significant obstructive CAD, while the distribution of single, double, and triple vessel disease (25%, 19.7%, and 19.7%, respectively) highlights the diversity of CAD severity. These findings underscore the heterogeneity of ACS presentations, ranging from minimal coronary involvement to extensive multivessel disease. Understanding this variability is crucial for risk stratification, treatment planning, and optimizing outcomes in ACS management.

The study underscores the multifactorial nature of ACS in postmenopausal women, implicating age, lifestyle factors like smoking and alcohol consumption, and obesity as significant contributors to ACS risk. Moreover, cardiac pathology diversity revealed by CA highlights the importance of tailored management approaches for optimal ACS outcomes.

References

1. Kodliwadmath A, Nanda N, Duggal B, et al. Comparative study of acute coronary syndrome in postmenopausal women and age-matched men: A prospective cohort study in Southern India. Ann Afr Med. 2022; 21(1): 8 – 15.
2. Siddika A, Malik F, Kalimuddin M, et al. Severity of Coronary Artery Diseases Among Pre- and Postmenopausal Women With Acute Coronary Syndrome: A Hospital-Based Study in Bangladesh. Cureus. 2023; 15(12): e50514.
3. Ahmed R, Das PR, Tushar AZ, et al. Comparison of angiographic severity of coronary artery diseases between pre- and postmenopausal women with acute coronary syndrome. Bangladesh Heart J. 2021, 36:113 – 23.
4. Weaver WD, White HD, Wilcox RG, et al. Comparisons of characteristics and outcomes among women and men with acute myocardial infarction treatment and thrombolytic therapy. JAMA. 2013; 27: 777 – 82.
5. Luca F, Abrignani MG, Parrini I, Di Fusco SA, et al. Update on Management of Cardiovascular Diseases in Women. J Clin Med. 2022; 11(5): 1176.
6. Damluji AA, Forman DE, Wang TY, et al. American Heart Association Cardiovascular Disease in Older Populations Committee of the Council on Clinical Cardiology and Council on Cardiovascular and Stroke Nursing; Council on Cardiovascular Radiology and Intervention; and Council on Lifestyle and Cardiometabolic Health. Management of Acute Coronary Syndrome in the Older Adult Population: A Scientific Statement from the American Heart Association. Circulation. 2023; 147(3): e32 – e62.
7. Oh ES, Fong TG, Hshieh TT and Inouye SK. Delirium in Older Persons: Advances in Diagnosis and Treatment. JAMA. 2017;318:1161–1174
8. Hochman JS, Tamis JE, Thompson TD, et al. Sex, clinical presentation, and outcome in patients with acute coronary syndromes. Global use of strategies to open occluded coronary arteries in acute coronary syndromes IIb investigators. N Engl J Med. 1999; 341: 226 – 32.
9. Hanratty B, Lawlor DA, Robinson MB, Sapsford RJ, Greenwood D, Hall A. Sex differences in risk factors, treatment and mortality after acute myocardial infarction: An observational study. J Epidemiol Community Health. 2000; 54: 912 – 6.
10. Floud S, Hermon C, Simpson RF, Reeves GK. Alcohol consumption and cancer incidence in women: interaction with smoking, body mass index and menopausal hormone therapy. BMC Cancer. 2023; 23(1): 758.
11. Powell-Wiley TM, Poirier P, Burke LE, et al. On behalf of the American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; Council on Epidemiology and Prevention; and Stroke Council. Obesity and cardiovascular disease: a scientific statement from the American Heart Association. Circulation. 2021; 143: e984 – e1010.
12. Bolz C, Blaszczyk E, Mayr T, Lim C, et al. Adiposity influences on myocardial deformation: a cardiovascular magnetic resonance feature tracking study in people with overweight to obesity without established cardiovascular disease. Int J Cardiovasc Imaging. 2024; 40(3): 643 – 54.
13. Kumar A, Cannon CP. Acute coronary syndromes: diagnosis and management, part I. Mayo Clin Proc. 2009; 84(10): 917 – 38.