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GENDER DISPARITIES IN METABOLIC SYNDROME AND CARDIOVASCULAR RISK

G. Jayalakshmi[1*]
[1]Department of Microbiology, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry - 605502, India.

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ABSTRACT

Metabolic syndrome (MetS) refers to a collection of susceptibility factors that contribute to the development of cardiovascular diseases (CVD) and type 2 diabetes (T2DM). Research findings indicate that the cardiovascular (CV) risk associated with Metabolic Syndrome (MetS) is comparatively elevated in females in comparison to males. Multiple variables may contribute to an increased cardiovascular risk in women with Metabolic Syndrome (MetS). The study aimed to assess gender disparities about characteristics of Metabolic Syndrome (MetS) and other cardiovascular disease (CVD) risk factors. The present study employed a cross-sectional, observational design at Holy Family Hospital in Bandra (West), Mumbai. The data collection period spanned from August 1, 2018, to January 31, 2020. Collecting clinical data involved acquiring the necessary medical history and case records from individuals who had previously experienced acute coronary syndrome (ACS). The study involved collecting and documenting anthropometric indicators and blood pressure measurements, as well as the analysis of laboratory investigative data. Multiple logistic regression models were employed to assess the adjusted odds ratios and 95 percent confidence intervals for gender differences among Indian patients diagnosed with metabolic syndrome. Statistical analysis employed: Data analysis was performed using SPSS software version 15. A study was undertaken to examine the correlation between gender and the variables in question, utilizing the PROC Logistics in SAS software. Among the 100 participants enlisted in this research, 66 were identified as male, while 34 were identified as female. 66% of the study population had a prevalence of Metabolic Syndrome (MetS). Among the 34 females, 28 individuals (82.35%) have Metabolic Syndrome (MetS). There was a significant correlation between gender and MetS (P value -0.0191), and the 95% odds ratio (0.113-0.849) is less than 0.05, indicating that the value 1 is not included in the 95% odds CI. There is a statistically significant difference in the means of body mass index, waist circumference, and fasting blood sugar, as indicated by a P-value of less than 0.05. There is no statistically significant association between gender and the occurrence of ST-elevation myocardial Infarction (STEMI) and Non-STEMI, as indicated by a P-value greater than 0.05 and a 95% confidence interval odds ratio of 1. Female patients had a higher incidence of Metabolic Syndrome (MetS), suggesting an elevated cardiovascular risk among this patient population. The comprehensive management of cardiovascular disease necessitates the implementation of gender-specific public health policies and treatment modalities.

Corresponding Author:

Dr. G. Jayalakshmi,
Department of Microbiology, Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry - 605502, India.
Email: jayalakshmi.2k15@gmail.com

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1. INTRODUCTION

Diabetes mellitus (MetS), also referred to as syndrome X or insulin resistance, is a significant worldwide health issue. According to the World Health Organization (WHO) [1], metabolic syndrome is a pathological condition characterized by the presence of abdominal obesity, insulin resistance, hypertension, and hyperlipidemia. It is believed to be the result of social and environmental changes associated with urbanized living conditions, the intake of high-calorie food, and a lack of physical activity [2] There exists a correlation between it and the onset and prognosis of cardiovascular diseases, which can ultimately result in the manifestation of diabetes (CVD) [3] Although there are multiple definitions of Metabolic Syndrome (MetS) and unknown causes, there is extensive evidence indicating a strong association between MetS and an increased risk of cardiovascular disease (CVD). The current global prevalence of Metabolic Syndrome (MetS) is estimated to affect more than 25% of the global population, suggesting that over one billion individuals are currently affected by this condition [4]. After controlling for age, sex, and urban-rural distribution, the prevalence rates of Metabolic Syndrome (MetS) were found to be 24 percent, 29 percent, and 33 percent, respectively. In the elderly population, Metabolic Syndrome (MetS) is a prevalent metabolic condition [5]. The senior population in India has a prevalence of MetS syndrome above 40%.

Further investigation is necessary to examine the effects of metabolic syndrome in the aged population. Metabolic syndrome (MetS) is a medical disease that coexists with obesity and type 2 diabetes. Based on NHNES figures, the mean BMI in the United States experienced an annual increase of 0.37 percent for both males and females between 1988 and 2010. The waist circumference (WC) exhibited an annual growth of 0.37 and 0.27 percent in males and females, respectively [6-8]. The prevalence of Metabolic Syndrome (MetS) seems to be higher among the urban populations of several emerging nations than their Western counterparts. Breast cancer resulted in the mortality of almost 30% of women, whereas cardiovascular disease led to the death of approximately 2.6% of women. The etiology of the diabetes discrepancy between males and females remains uncertain, although a potential explanation could be attributed to the elevated prevalence of Metabolic Syndrome (MetS) in females.

There is variation in the gender distribution of Metabolic Syndrome (MetS) as observed in published epidemiology data across different locations worldwide. While specific studies indicate a higher prevalence of Metabolic Syndrome (MetS) among males than females [9, 10], contrasting findings have also been reported. Age dependency is a consistent observation in the occurrence of metabolic syndrome, with a tendency for the prevalence of MetS to increase with advancing age [11]. Multiple research indicates that the prevalence of Metabolic Syndrome (MetS) in older individuals varies between 20% and 60%, with females exhibiting a higher occurrence than males. According to a study conducted in Korea, those diagnosed with Metabolic Syndrome (MetS) showed a 48 percent elevated risk of cardiovascular disease (CVD) and a 60 percent increased risk of CVD-related mortality compared to those without MetS. Nevertheless, the available evidence regarding gender variances in Metabolic Syndrome (MetS) traits and components within the Indian population is inadequate.

Consequently, the present study was conducted to evaluate gender disparities in connection to Metabolic Syndrome (MetS) and other cardiovascular disease (CVD) risk factors. The objective was to determine the frequency, relationships, and gender distribution of Metabolic Syndrome (MetS) components in individuals with diabetes. The findings would provide crucial gender-specific insights into the management of Metabolic Syndrome (MetS) in females to prevent cardiovascular disease (CVD).

2. METHODS

The present study employed a cross-sectional, observational design at Holy Family Hospital in Bandra (West), Mumbai. The data collection period spanned from August 1, 2018, to January 31, 2020. Before initiating the investigation, approval from the institutional ethical committee was obtained. All participants provided written consent.

The patient enrolment criteria encompassed individuals of both genders, aged between 40 and 80 years, who presented with acute coronary syndrome STEMI and NSTEMI and exhibited normal liver and renal function. The study excluded individuals having a prior history of cardiovascular disease (CVD), unstable angina, impaired renal function, cardiomyopathies, thyroid dysfunction, malignancy, acute infection, and cardiogenic shock at admission.

The study exclusively encompassed patients who met the eligibility criteria. The various elements of the condition were solely derived from the comprehensive clinical histories. Interviews and medical records were utilized to gather information about the diabetes mellitus history, medication type, presence of comorbidities, and smoking and drinking histories of the research participants.

The body mass indices (BMI) and waist circumferences were assessed during the clinical examination. During the enrolling process, three or more blood pressure measures were collected if the average blood pressure readings were below 130/85 mmHg and the pharmacological treatment for hypertension was deemed substantial. According to the guidelines provided by the National Health and Nutritional Survey, waist circumference measurement was documented. After an overnight fast, peripheral venous blood samples were collected to assess the lipid profile, including high-density lipoprotein cholesterol (HDL-C), total cholesterol, low-density lipoprotein cholesterol (LDL-C), and triglycerides. Additionally, fasting plasma glucose levels were evaluated.

The patients were diagnosed and categorized either upon admission or subsequently throughout their hospitalization, utilizing the World Health Organization's criteria for Acute Coronary Syndrome (ACS) and the official guidelines of the European Society of Cardiology. All individuals exhibiting symptoms indicative of myocardial ischemia and displaying increased levels of CK-MB or troponin I within 48 hours following admission were classified with acute coronary syndrome (ACS). ACS with ST-segment elevation (STEMI) was diagnosed when the electrocardiogram (ECG) at rest showed ST-segment elevation in two consecutive leads (two millimeters in V1-V3 or one millimeter in the other leads) or new left bundle-branch block along with elevated cardiac enzymes. Patients exhibiting elevated cardiac enzymes in the absence of the electrocardiogram above (ECG) abnormalities were categorized as acute coronary syndrome without ST-segment elevation (NSTEMI).

The individual received a diagnosis of unstable angina, a condition characterized by angina pectoris that exhibits at least one of the following three attributes: (1) experiencing pain during periods of rest or moderate exertion, (2) becoming severe angina within a month, and (3) displaying a crescendo pattern. (3) NSTEMI and unstable angina exhibit a comparable visual presentation overall. Assessing biochemical signs related to myocardial injury plays a crucial role in determining the appropriate therapy and diagnosis. The research excluded individuals diagnosed with unstable angina due to the subjective and imprecise nature of the diagnosis, which is subject to variation based on the treating physician and the patient's medical history. Individuals who are undergoing lipid-lowering medication therapy, specifically statins, are classified as having dyslipidemia.

Data analysis was performed using SPSS software version 15, and the study findings were entered into Microsoft Excel 2010. The presentation of qualitative data is facilitated through the utilization of frequency and percentage tables. The Chi-Square test is utilized to establish associations between different qualitative variables. A significance threshold of 0.05 is considered to be the p-value. A study was undertaken to examine the correlation between gender and the variables in question, utilizing the PROC Logistics in SAS software.

3. RESULTS

This study included a cohort of 100 individuals diagnosed with acute coronary syndrome, comprising 34 females and 66 males. Female patients had an average age of 66.26 (±8.18) years, while male patients had an average age of 60.24 (±11.10.18) years. The average weight of female patients was 75.727 kg (±13.209) kg, while their BMI was 25.359 kg/m2 (±2.294). The female patients had a mean weight of 67.02 (±6.51) kg and a BMI of 25.547 (±2.372) kg/m2. The subjects exhibited a prevalence rate of 66% for metabolic syndrome, with a higher occurrence observed in females (28, 82.35%) compared to males (39, 59.09%) (57.6%). Table 5 summarizes the clinical and laboratory data for girls and males with Metabolic Syndrome (MetS). Figure 1 illustrates the distribution of different components of metabolic syndrome among the female and male groups.

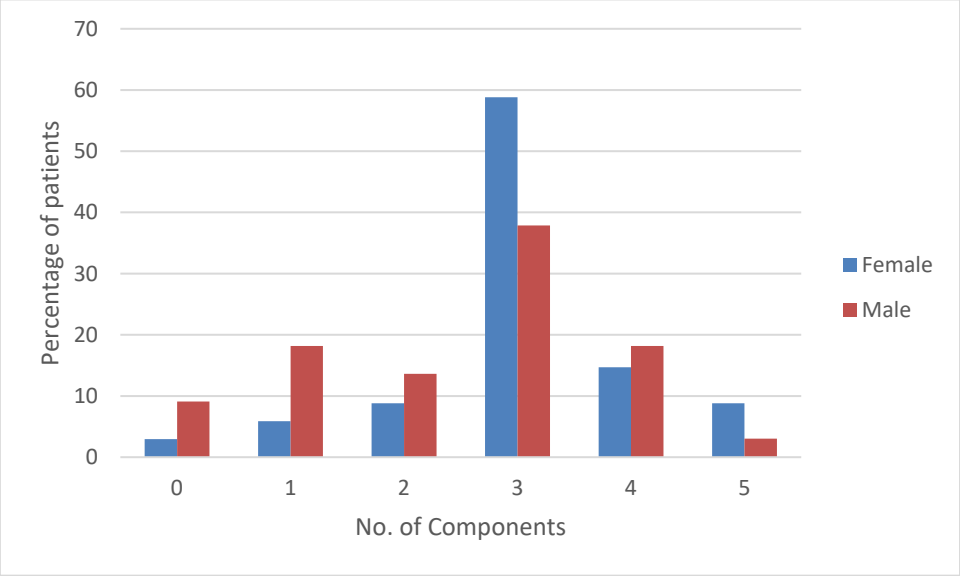

Figure 1: The distribution of various components of metabolic syndrome between the female and male groups

Table 2 summarizes the frequency distribution of lipid parameters across female and male patients. STEMI was reported in 22 females (64.70%) and 46 males (69.69%), while NSTEMI was detected in 12 females (35.29%) and 20 males (30.30%) (Figure 2).

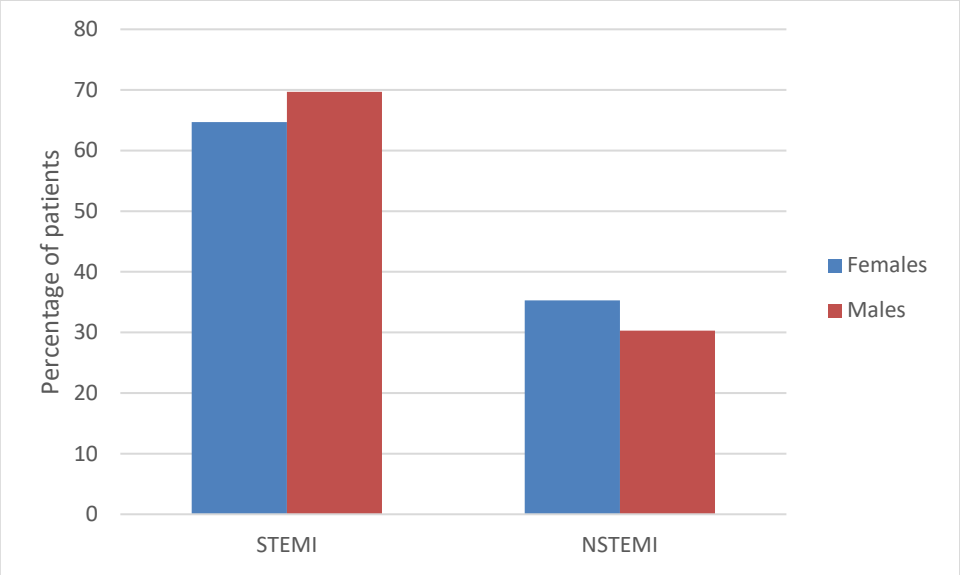

Figure 2: The percentage of STEMI and NSTEMI observed in female and male groups

All of the female patients and 59 males (89.39%) were aged over 45 years, while seven males (11.86%) fell between 18 to 45 years. All participants included in the study exhibited a height exceeding 1.5 meters. In 30 (8.23%) females and 64 (96.96%) males, the patient's weight exceeded 60 kg. Twelve females (35.29%) had a high BMI, while 24 females (36.36%) had a high BMI. 33 (97.05%) females and 51 (77.27%) females had a large waist circumference. Table 1 displays a concise overview of the frequency distribution about the clinical parameters of the patients.

Table 1: Frequency distribution of demographic characteristics of female and male patients

Gender	Female N=34 (%)	Male N =66 (%)
Age		
>18-45 **Yrs.**	0 (0.00%)	7 (11.86%)
>45 **Yrs.**	34 (100%)	59 (89.39%)
HEIGHT		
>1.5 **Meters**	34 (100.00%)	66 (100.00%)
WEIGHT		
<30 **Kg**	0 (0.00%)	2 (3.03%)
30-60 **Kg**	4 (11.76%)	0 (0.00%)
>60 **Kg**	30 (88.23%)	64 (96.96%)
BMI		
Normal **(< 30 kg/m^2)**	22 (64.70%)	42 (63.63%)
High **(≥30 kg/m^2)**	12 (35.29%)	24 (36.36%)
WC		
High (>102 cm in males and > 88 cm in females)	33 (97.05%)	51 (77.27%)
Low (≤ 102 cm in males and ≤ 88 cm in females)	1 (2.94%)	15 (22.72%)

The lipid profile analysis indicated a greater prevalence of anomalies in males compared to the female population. Thirteen female patients (38.23%) and thirty-three male patients (50.00%) exhibited elevated triglyceride levels. A total of 3 (8.82%) female patients and 24 (36.36%) male patients showed reduced levels of HDL. Table 2 summarizes the frequency distribution of lipid parameters across female and male patients.

Table 2: Frequency distribution of lipid parameters in female and male patients

Gender	Female N=34 (%)	Male N=66 (%)
TG		
Normal TG (<150 mg/dL)	21 (61.76%)	33 (50.00%)
High TG (≥ 150 mg/dL)	13 (38.23%)	33 (50.00%)
HDL (mg/dL)		
Low HDL (< 40 mg/dL in men and < 50 mg/dL women),	3 (8.82%)	24 (36.36%)
Normal HDL (≥40 mg/dL in men and ≥ 50 mg/dL women),	31 (91.17%)	42 (63.63%)
LDL (mg/dL)		
Normal LDL (<129 mg/dL)	31 (39.17%)	49 (74.24%)
High LDL (≥130 mg/dL)	3 (8.82%)	17 (25.75%)
VLDL (mg/dL)		
Normal VLDL (<30 mg/dL)	22 (64.70%)	41 (62.12%)
High VLDL(≥30 mg/dL)	12 (35.29%)	25 (37.87%)
CHOLESTEROL (mg/dL)		

Normal CHOLESTEROL (<200 mg/dL)	30 (88.23%)	47 (71.21%)
High CHOLESTEROL (≥200 mg/dL)	4 (11.76%)	19 (19%)

Table 3: Frequency distribution of fasting blood sugar and blood pressure in female and male patients

Fasting Blood Sugar		
Normal(< 100mg/dL)	6 (17.64%)	13 (19.69%)
High (≥100 mg/dL)	28 (82.35%)	53 (28.78%)
Blood pressure		
Normal(< 130/85 mm Hg)	9 (26.47%)	23 (34.84%)
High (≥130/85 mm Hg)	25 (73.52%)	43 (65.15%)

28 (82.34%) females and 53 (80.30%) males exhibited elevated fasting blood sugar levels. Table 3 indicates that 25 (73.52%) females and 43 (65.150%) males had high blood pressure. The creatinine kinase levels were elevated in 1 female (2.94%) and three males (4.54%). The CK MB exhibited a high value in 1 female (2.94%) and 17 females (25.75%). Figure 3 illustrates the troponin levels in both females and males.

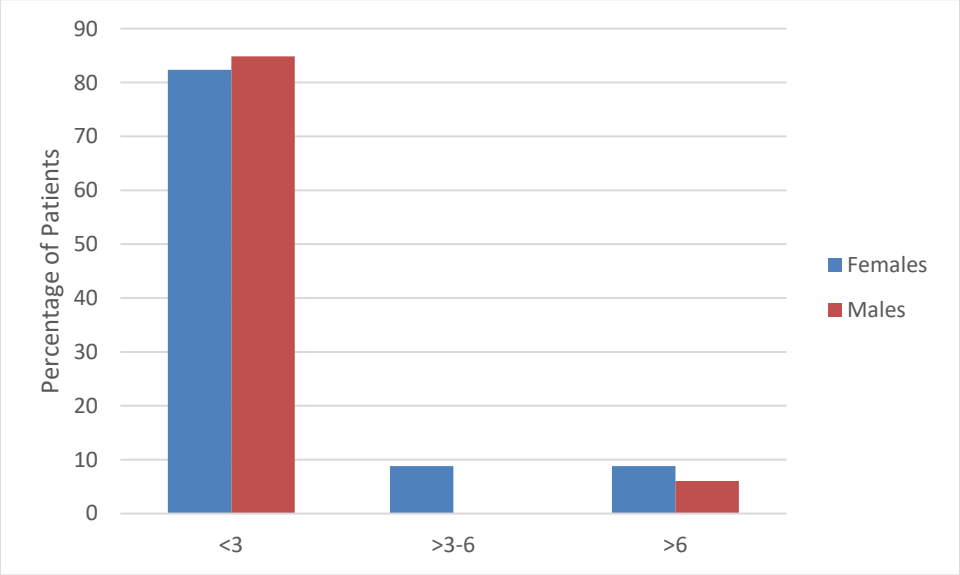

Figure 3: The troponin levels in female and male groups

An analysis was conducted using PROC Logistics in SAS software to determine the association between gender and the associated variables. The study revealed a significant association between gender and MetS, as indicated by a P-value of 0.0191. The 95% odds ratio (0.1128-0.8490) is less than 0.05, and the value of 1 is not included in the 95% odds CI. An analysis of variance (ANOVA) was performed to examine the variations in parameters based on gender using the PROC GLM function in SAS software. The findings are displayed in Table 5.

Table 5: Difference in the clinical and laboratory parameters based on gender

Parameter	**Female***	**Male***	**P-value**	**95% CI Lower**	**95% CI Upper**	**Significance**
Age (Yrs.)	66.265 (8.185)	60.242 (11.108)	0.0063	-10.302	-1.741	Significant
Height (m)	1.619 (0.025)	1.746 (0.038)	<.0001	0.1124	0.141	Significant
Weight (kg)	67.029	75.727	0.0005	3.921	13.474	Significant

	(6.516)	(13.209)				
BMI	25.359 (2.294)	25.547 (2.372)	0.7048	-0.794	1.170	Insignificant
WC (mg/dL)	90.147 (5.088)	95.848 (5.760)	<.0001	3.379	8.023	Significant
TG (mg/dL)	155.618 (60.349)	160.000 (46.942)	0.6897	-17.336	26.101	Insignificant
HDL (mg/dL)	55.441 (12.471)	46.273 (14.004)	0.0018	-14.826	-3.510	Significant
LDL(mg/dL)	125.971 (22.069)	129.818 (34.323)	0.5547	-9.032	16.728	Insignificant
VLDL (mg/dL)	32.559 (6.734)	35.242 (11.557)	0.2152	-1.585	6.952	Insignificant
Total Cholesterol (mg/dL)	197.382 (38.182)	210.712 (57.219)	0.2240	-8.286	34.945	Insignificant
FBS (mg/dL)	131.294 (29.764)	131.712 (30.810)	0.9483	-12.343	13.179	Insignificant
CK	116.647 (33.919)	111.333 (47.306)	0.5620	-23.437	12.810	Insignificant
CK MB	20.191 (12.394)	21.733 (18.148)	0.6577	-5.343	8.427	Insignificant
TROP I	1.767 (2.590)	1.580 (2.450)	0.7233	-1.233	0.859	Insignificant
Components	3.029 (1.058)	2.470 (1.315)	0.0342	-1.076	-0.042	Significant

*Quantitative data are displayed as mean values and standard deviation

The study found significant differences in the means of age (P-value -0.0063, 95% CI -10.302 to -1.741), height (P-value -0.0001, 95% CI 0.112 to 0.141), weight (P-value -0.0005, 95% CI 3.921 to 13.474), waist circumference (P-value -0.0001, 95% CI 3.379 to 8.023), and components of MetS (P-value -0.0342, 95% CI -1.076 to -0.042) between females and males. The P-value is less than 0.05, and the 95% CI levels do not include 0. A chi-squared test was performed using SAS software to determine if there is any correlation between STEMI and NSTEMI with gender. The results are as follows: The statistical analysis reveals that there is no significant difference in the means between STEMI (P-value -0.6123, 95% CI 0.5216- 3.0176) and NSTEMI (P-value 0.6123, 95% CI 0.3314- 1.9173). This conclusion is supported by the P-value being less than 0.05 and the 95% CI levels do not include 0.

4. DISCUSSION

Metabolic syndrome (MetS) encompasses various factors, including abdominal obesity, elevated triglyceride levels, low high density alcohol use, elevated blood pressure, and a medical history of diabetes mellitus or impaired fasting glucose levels. About the susceptibility to type 2 diabetes mellitus (DM) and cardiovascular disease (CVD), the MetS holds considerable importance. MetS is associated with various risk factors, including obesity, advanced age, a sedentary lifestyle, diabetes, coronary artery disease, and lipodystrophies. It is widely believed that the metabolic syndrome is prevalent among those diagnosed with type 2 diabetes or those with reduced glucose tolerance [12-21] (22) MetS is more common in patients with CAD than in the general population, and its occurrence

increases with age in a gender-specific manner. Specifically, it is slightly higher in men before the age of 50, but it reverses after the age of 50.The present study observed a somewhat reduced overall prevalence of metabolic syndrome among participants compared to a prior report on metabolic syndrome (Mets). However, the prevalence of MetS in the female population was greater (82.35%), which aligns with the findings of the previous publication [22, 23]. The significant increase in the occurrence of Metabolic Syndrome (MetS) among women as they age can be attributed to various causes, which can be classified as sex- and gender-related factors. Sexual variables encompass genetic and biochemical mechanisms, which are influenced by hyperandrogenism and insulin resistance. Additionally, the postmenopausal era is associated with an increase in abdominal obesity and a drop in HDL-cholesterol levels. Female hypersensitivity to social and cultural behaviors, nutritional habits, and psychosocial aspects are among the gender-related characteristics. Typically, women are more susceptible than men to developing Metabolic Syndrome (MetS) as a result of occupational stress and a lower socio-economic level.The varying frequency of Metabolic Syndrome (MetS) based on sex and gender can lead to a range of associated cardiovascular risk (CV) risks. Prospective studies indicate that the cardiovascular risk in women with MetS is not only similar but also higher than the cardiovascular risk in males with MetS. When considering the presence of overt diabetes mellitus (DM), the gap is primarily diminished. Although the risks for cardiovascular events are the same, older women may experience a higher incidence of CV events compared to males due to the higher prevalence of Metabolic Syndrome (MetS). The impact of Metabolic Syndrome (MetS) treatments, such as lifestyle modifications and weight reduction, may exhibit variations between males and females. Moreover, observational research suggests that non-pharmaceutical therapeutic interventions targeting the reduction of Metabolic Syndrome (MetS) exhibit greater efficacy in men than women [24, 25]. Multiple meta-analytic studies indicate that the cardiovascular risk associated with Metabolic Syndrome (MetS) is higher in females than in males. The increased cardiovascular risk in women with Metabolic Syndrome (MetS) can be linked to several factors. The primary changes are associated with the distribution of central adiposity, lipid profile, insulin resistance, and hormones. However, anomalies in platelet biology and biochemistry also contribute to this risk. The significance of age as a risk factor for Metabolic condition (MetS) cannot be overstated, given that the prevalence of this condition is influenced by age in nearly all populations globally [26]. The average age of female patients in this study was 66.26 (±8.18) years, whereas male individuals had an average age of 60.24 (±11.10.18) years. All of the female patients and 59 males (89.39%) were aged over 45 years, while 7 males (11.86%) fell between 18 to 45 years. These findings align with the results reported in a Finnish study on Metabolic Syndrome (MetS), which observed a positive correlation between the age of women and the prevalence of MetS [27]. A pattern was noted in the population of Seychelles (28), where the highest occurrence of Metabolic Syndrome (MetS) according to the ATP criteria was observed among men aged 45-54.The metabolic syndrome is characterized by insulin resistance and elevated blood sugar levels despite variations in its definitions.This study observed that the prevalence of high fasting blood sugar (FSB) was higher among women than men. Although fasting blood sugar (FBS) is commonly used to identify metabolic syndrome (MetS), clinical data indicate that the glucose level following a glucose load is often higher than FBS in women. In contrast, the opposite trend is observed in men.Moreover, the post-glucose-load glucose level is indicative of cardiovascular mortality in women [28-31]. Therefore, the utilization of FBS may result in the underestimation of women with MetS.Abdominal or central obesity is a significant clinical characteristic of Metabolic Syndrome (MetS). The IDF and the revised NCEP offer two primary definitions for Metabolic Syndrome (MetS). In this study, 33% of women and 51 % of men had high waist circumference, whereas 35% of women and 36 % of men had high waist circumference, which was found to be lower in comparison to the study by Anthonia O Ogbera. Several researchers have reported decreased rates, up to 25%, of central obesity incidence in individuals with Metabolic Syndrome (MetS).

In this study, as per this proposed criterion, the fasting blood sugar levels were high in 82.34% of females and 80.30% of males. (18)The lipid profile revealed higher abnormalities in males compared to females. Thirteen female patients (38.23%) and thirty-three male patients (50.00%) exhibited elevated triglyceride levels. A total of 3 (8.82%) female patients and 24 (36.36%) male patients exhibited reduced levels of HDL. The findings of our study were consistent with previous research [32]. The prevalence of elevated LDL in subjects with the Mets has been noted to increase the magnitude of the risk for developing CAD. The study participants exhibited normal VLDL, LDL, and total cholesterol levels.

Gender differences were also reported in the prevalence of high blood pressure in the Mets. In this study proportion of women with the Mets who had elevated blood pressure was significantly higher than men. The results of this study align with previous data described in published literature [33, 34].

The components of the MetS vary in their rates of occurrence. Every individual component of the MetS has been identified as a risk factor for CVD, and patients with ≥ 3 components are at particularly high risk. We found a comparable distribution of the components of the MetS in both sexes, but overall, MetS is higher in females as compared to males. Our study had a small proportion of type 2 DM patients with all the components of the Mets. Gender variations in cardiac troponin concentrations are not frequently recognized in clinical practice. This might lead to underdiagnosis of myocardial infarction in women, resulting in variations in patient management and prognosis [35]. Variations in the reference range and the diagnostic threshold for myocardial infarction in men and women have been discovered using modern high-sensitivity cardiac troponin tests. Using a standard cardiac troponin threshold does not give identical risk stratification in men and women, necessitating lower thresholds for women to achieve comparable risk stratification [35]. The disparities in reference limits are most likely due to differences in CV pathophysiology or the frequency of sub-clinical diseases in men and women.

Researchers discovered peak troponin levels were lower in female hospital patients than [in males 35]. It needs to be understood why there is a variation in the distribution of cardiac troponin concentrations in men and women [36]. Our study also revealed lower levels of Troponins and CK-MB in females compared to males.

Today, vast knowledge exists related to pathophysiological differences between genders regarding the prevalence of MetS components and the related CV risk. However, lower representation of women in clinical studies and underutilization of guideline therapy in women with CAD leads to misinterpretation of epidemiological and clinical data. Therefore, efforts should be made to combat the so-called "Yentl syndrome" and to encourage gender-specific clinical trials. (25) The American Heart Association (AHA) published evidence-based guidelines for CVD prevention in women and recommended lifestyle interventions [37].

5. CONCLUSION

This study has identified a significant prevalence rate of Metabolic Syndrome (MetS) in both males and females with coronary artery disease (CAD), suggesting a substantial burden of both cardiovascular and diabetic consequences. Females with suspected coronary artery disease (CAD) have lower rates of inquiry and treatment compared to males and consistently experience inferior outcomes. Clinical and epidemiological research on MetS and CV illness must take into account gender specificities as a mandatory requirement. This is necessary to gain deeper insights and build more effective healthcare interventions.

FUNDING

Nil

ETHICAL APPROVAL

Nil

COMPETING INTEREST

The authors declare no conflict of interest.

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