



Retrospective data interpretation – CABG in female patients

Samyuktha D V^{1*}, Maruthu pandi²

¹Group Clinical Pharmacist, Kauvery Hospital, Trichy, Tamil Nadu

²Clinical Pharmacist-Intern, Kauvery Hospital, Trichy, Tamil Nadu

*Correspondence

Abstract

Background: Numerous studies suggest that female patients undergoing coronary artery bypass grafting (CABG) have a higher risk of postoperative mortality and morbidity compared to their male counterparts. However, data remains controversial, with some analyses suggesting that after adjusting for confounding factors like age and comorbidities, the outcomes are comparable. The objective of this study was to retrospectively evaluate the impact of sex on early and mid-term outcomes after isolated CABG surgery in a single-center cohort.

Key words: CABG surgery; Women; Very low lipoprotein; CHO/HDL ratio

1. Introduction

Coronary artery disease (CAD) is a leading cause of morbidity and mortality in India and represents a major public health challenge. Epidemiological studies have shown that the prevalence of CAD in the Indian population ranges from approximately 3–4% in rural areas to 8–10% in urban populations, with a steadily rising burden among women. Cardiovascular diseases account for nearly one million female deaths annually in India, highlighting the significant mortality associated with CAD in Indian women. Women often present with CAD at an older age and with more advanced disease due to delayed diagnosis and under-recognition of cardiovascular risk [1]. Coronary Artery Bypass Grafting (CABG) is a well-established revascularization strategy for patients with severe multivessel coronary artery disease. In India, CABG constitutes a substantial proportion of cardiac surgical procedures performed each year, with reported operative mortality rates ranging between 2–3% in the general population, though higher mortality has been observed among women in some studies. Factors such as advanced age, diabetes mellitus, hypertension, and diffuse coronary involvement contribute to increased perioperative risk and influence postoperative outcomes in female patients [8,10]. Dyslipidemia plays a pivotal role in the development and progression of atherosclerosis and is strongly associated with the severity of coronary artery disease. Abnormal lipid parameters, including elevated LDL, reduced HDL, hypertriglyceridemia, and unfavorable lipid ratios, are commonly observed in patients with advanced CAD. Given the limited gender-specific Indian data on clinical profile, disease severity, lipid abnormalities, and outcomes following CABG, the present study aims to evaluate these parameters among female patients undergoing CABG, thereby contributing to improved risk assessment and preventive strategies in this high-risk population [11].

Citation: Samyuktha D V, Maruthu pandi. Retrospective data interpretation – CABG in female patients. *Kauverian Med J.* 2026;3(3):23-36

Academic Editor: Dr. Venkita S. Suresh

ISSN: 2584-1572 (Online)



Copyright: © 2026 by the authors. Submitted for possible open access publication under the terms and conditions.

2. Methodology

Study Design: Retrospective observational study

Study Period: January–November 2025 (11 months)

Study Population: The study included female patients who underwent CABG during the study period.

Sample size: A total of 98 female patients who underwent CABG were included in the analysis.

Data collection: Datas were collected retrospectively from hospital reords, including demographic details, Angiographic findings, Comorbid conditions, Lipid profile parameters, Postoperative outcomes and Cause of mortality.

Data Analysis: Descriptive statistics were used to calculate the percentage of demographic characteristics, disease patterns, comorbidities, lipid abnormalities, and clinical outcomes in female patients undergoing CABG.

3. Study Overview

A retrospective observational analysis was conducted among female patients who underwent Coronary Artery Bypass Grafting (CABG). A total of 98 female patients had undergone CABG between Jan – Nov 2025.

Age-wise Distribution of Female CABG Patients

Out of 98 female patients who underwent CABG

Age	Female
41-50	16
51-60	34
61-70	43
71-80	5
Total	98

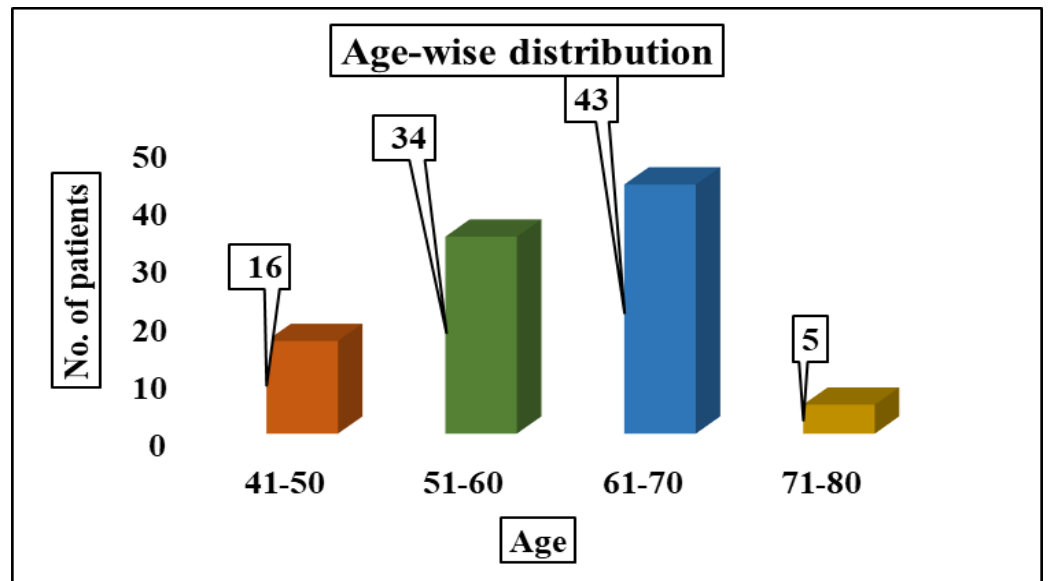


Fig (1): Age-wise Distribution of Female CABG Patients

The majority of female CABG patients belonged to the 61–70 years’ age group (43 patients), followed by 51–60 years (34 patients). This indicates that CABG was more commonly performed in elderly women, reflecting increased severity and progression of coronary artery disease with advancing age.

Vessel-wise Coronary Artery Disease Pattern

Disease pattern	Total
SVD	3
DVD	19
TVD	75
critical LM disease	1

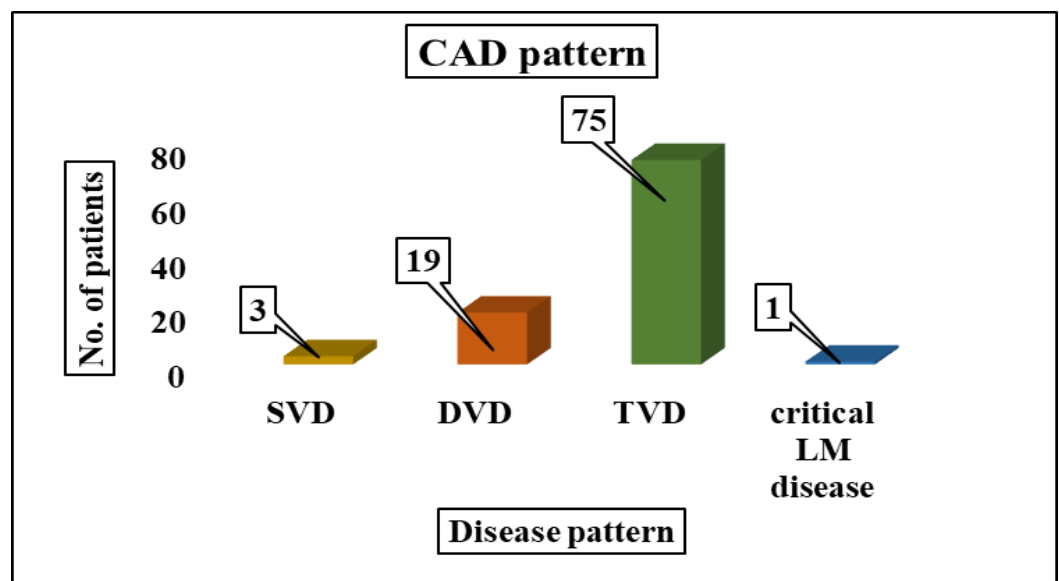


Fig (2): Vessel-wise Coronary Artery Disease Pattern

Triple Vessel Disease (TVD) was the predominant indication for CABG, observed in 75 out of 98 patients, suggesting advanced coronary involvement among female patients. Single vessel disease was minimal, indicating that most women presented with severe multivessel disease requiring surgical revascularization.

Age-wise Outcome Analysis

	41-50	51-60		61-70		71-80	
Gender	Alive	Alive	Death	Alive	Death	Alive	Death
Female	16	33	1	38	5	4	1

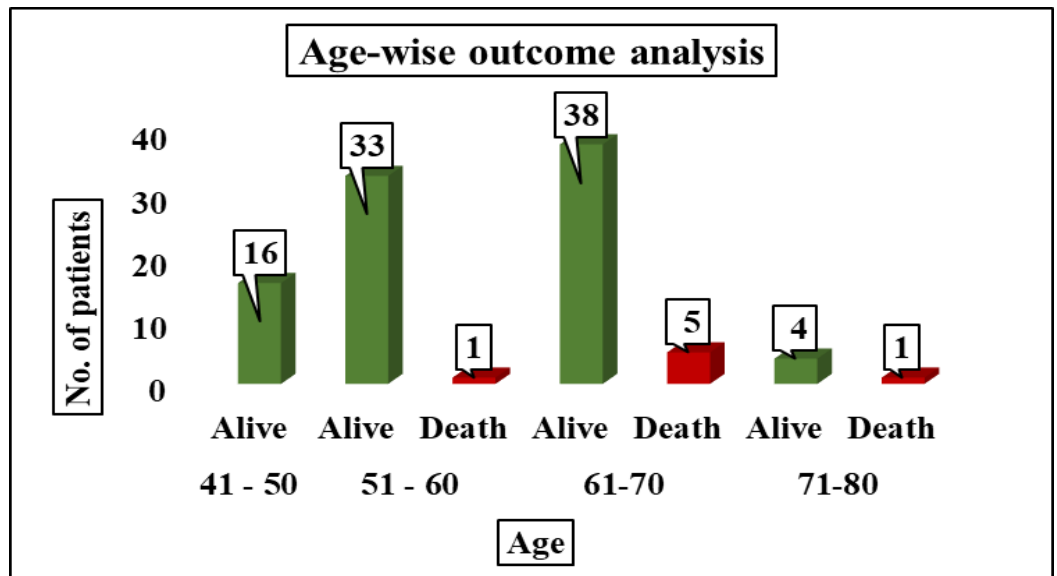


Fig (3): Age-wise Outcome Analysis

Overall survival among female CABG patients was high. Mortality was predominantly observed in older age groups, especially among patients aged 61 years and above, indicating age-related risk and higher comorbidity burden influencing outcomes.

4. Comorbidity Profile of Female CABG Patients

Comorbidities	Total
Diabetes	87
Hypertension	75
Dyslipidemia	3
Hypothyroidism	22
CKD	6
Hyperlipidemia	1
AKI	3

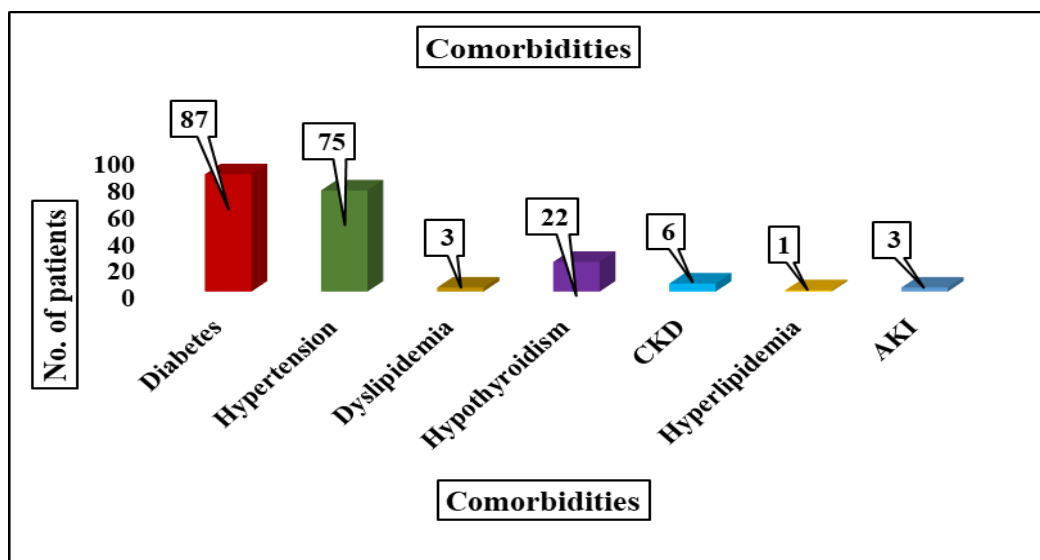


Fig 4: Comorbidity Profile of Female CABG Patients

Diabetes mellitus (87 patients) and hypertension (75 patients) were the most common comorbidities among female CABG patients. The high prevalence of metabolic disorders highlights their significant role in the progression of coronary artery disease leading to surgical intervention. Other comorbidities such as hypothyroidism and CKD were also observed, contributing to increased perioperative risk.

5. Cause of Death Analysis

Cause of death	No. of Patients
Cardiogenic Shock	3
Refractory Cardiogenic shock	2
Septic Shock with Multi organ failure	1
Refractory neurogenic shock	1

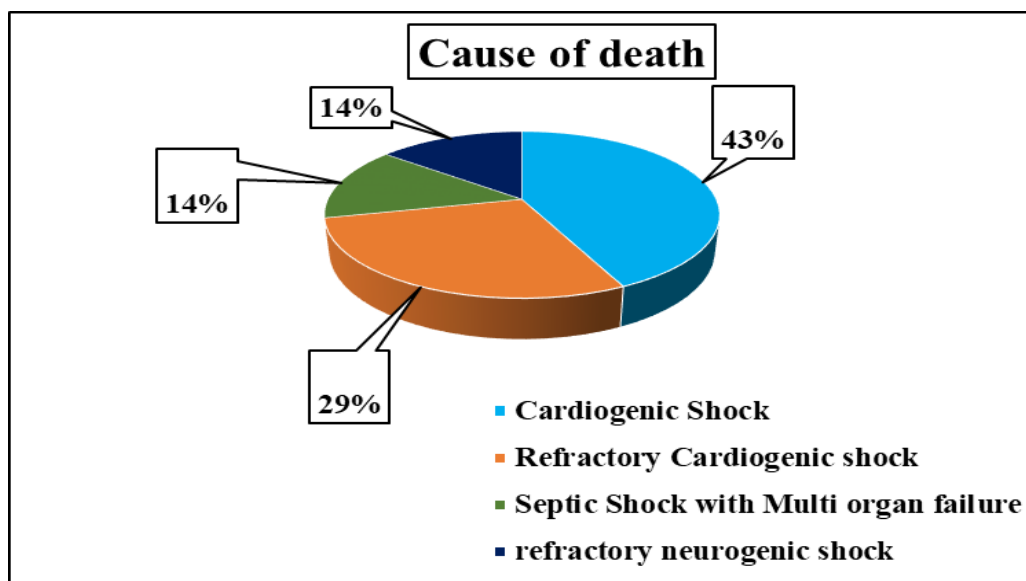
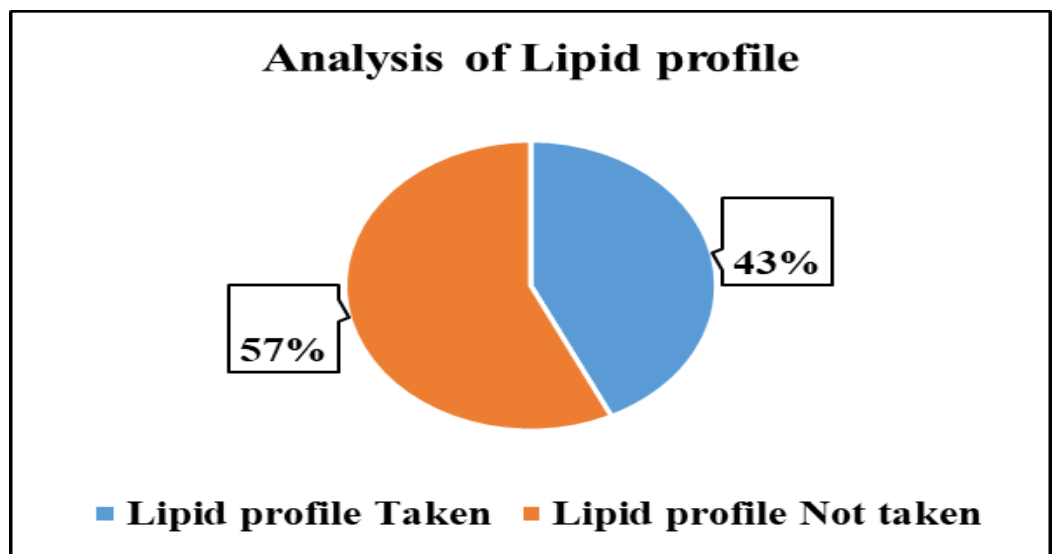


Fig (5): Cause of Death Analysis among Female CABG Patients

The most common cause of mortality among female CABG patients was cardiogenic shock (43%), followed by refractory cardiogenic shock (29%). Septic shock with multi-organ failure and refractory neurogenic shock each contributed to 14% of deaths. This highlights that cardiac-related complications remain the primary cause of postoperative mortality following CABG in female patients

Lipid Profile Distribution Based on Severity of Coronary Artery Disease

Lipid profile		
Total	Taken	Not taken
98	42	56



Among the 98 patients who underwent CABG, lipid profile evaluation was carried out in only 42 patients.

6. Overall Lipid Profile Abnormalities

Lipid profile	LDL (>100)	HDL (<60)	TGL (>150)	VLDL (>40)	Tot. cholesterol (>200)
SVD	1	1	-	-	1
DVD	3	8	4	2	2
TVD	14	32	13	5	6

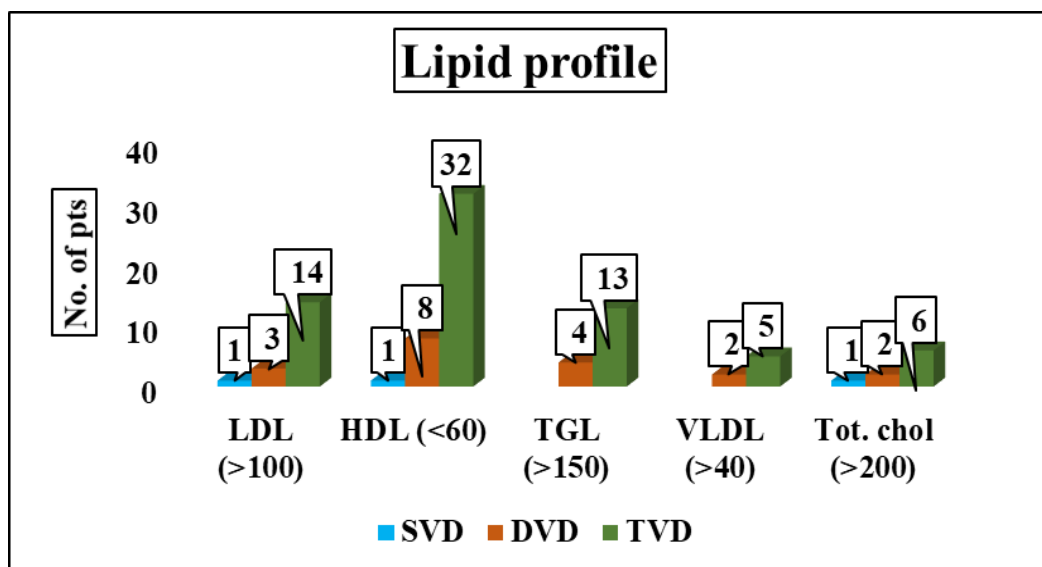


Fig (6): Lipid Profile Distribution Based on Severity of CAD

The combined lipid profile analysis showed that abnormalities in LDL (>100 mg/dL), HDL (<60 mg/dL), TGL (>150 mg/dL), VLDL (>40 mg/dL), and total cholesterol (>200 mg/dL) were most frequently observed in patients with Triple Vessel Disease.

6.1. Low-Density Lipoprotein (LDL)

LDL	<100	100–159	>160
DVD	5	3	-
SVD	-	1	-
TVD	19	8	6

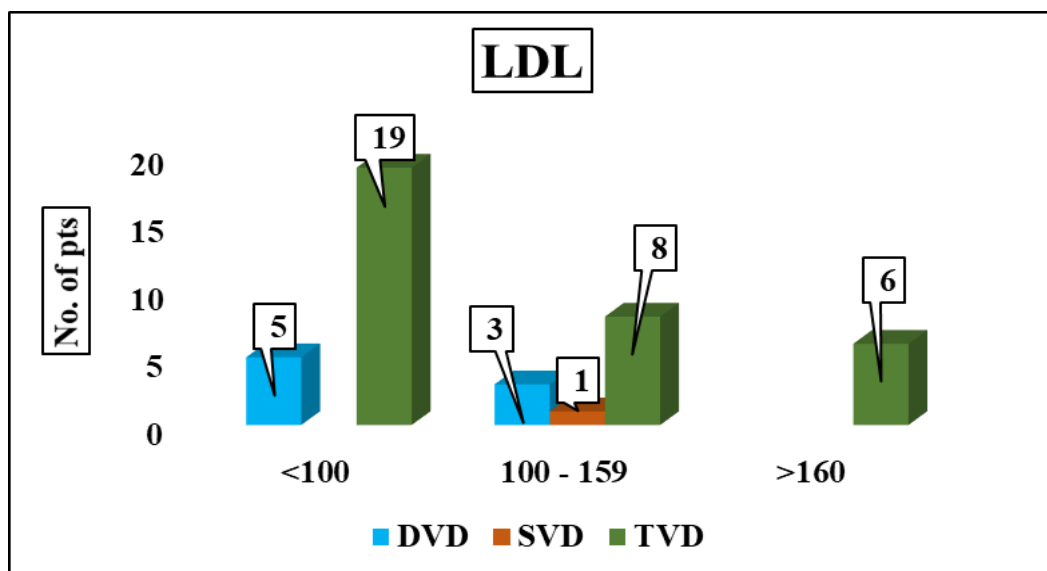


Fig 6.1: LDL Distribution Based on Severity of CAD

Elevated LDL levels were more commonly associated with severe coronary artery disease, particularly TVD, suggesting a strong correlation between LDL elevation and disease severity.

6.2. High-Density Lipoprotein (HDL)

HDL	<40	40 - 60	>60
DVD	7	1	-
SVD	-	1	-
TVD	24	8	1

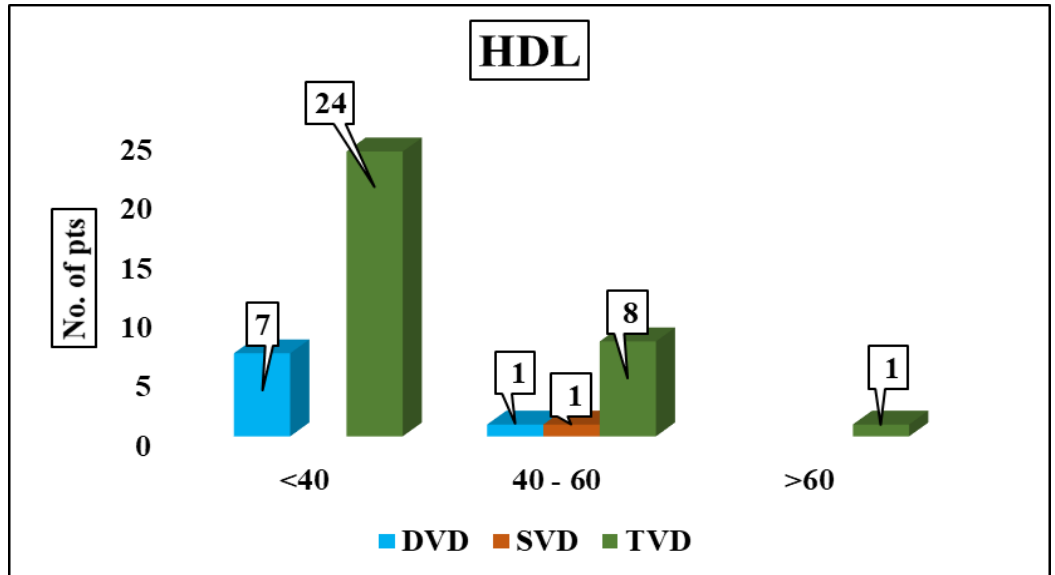


Fig 6.2: HDL Distribution Based on Severity of CAD

Reduced HDL levels were significantly associated with advanced coronary involvement, reinforcing the protective role of HDL against atherosclerotic progression.

6.3. Triglycerides (TGL)

TGL	<150	150 - 199	>200
DVD	4	2	2
SVD	1	-	-
TVD	20	8	5

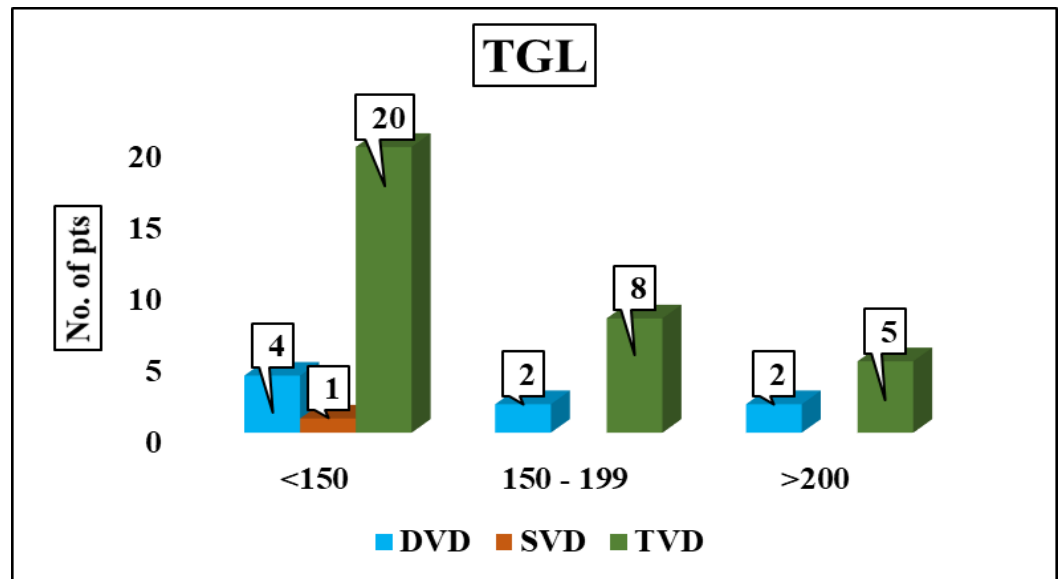


Fig 6.3: TGL Distribution Based on Severity of CAD

Hypertriglyceridemia was more prevalent in patients with severe multi-vessel disease, indicating its role as an important cardiovascular risk factor.

6.4. Very Low-Density Lipoprotein (VLDL)

VLDL	10 to 40	>40
DVD	6	2
SVD	1	-
TVD	28	5

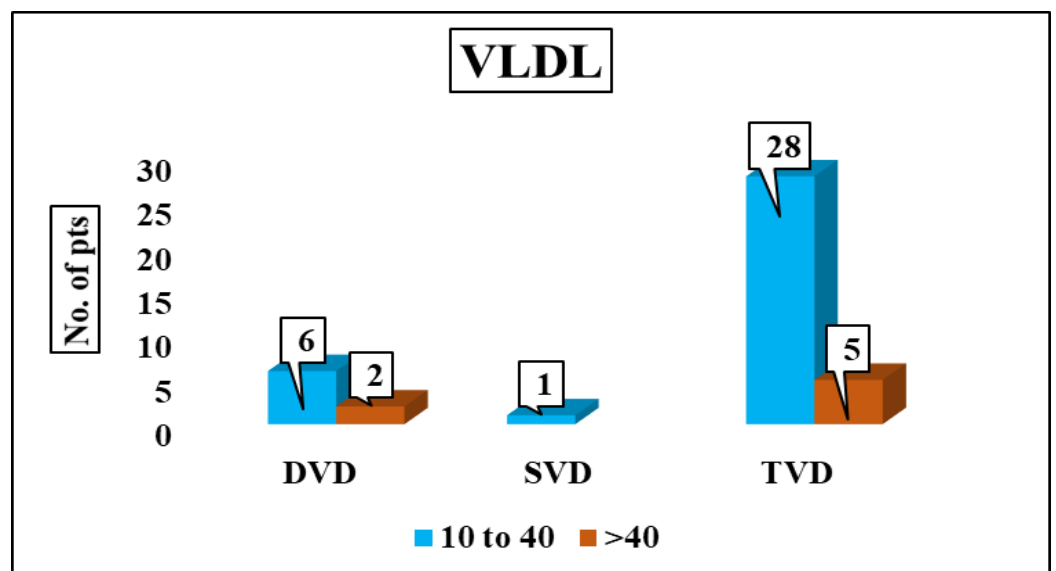


Fig 6.4: VLDL Distribution Based on Severity of CAD

Increased VLDL levels correlated with greater severity of coronary artery disease, particularly in TVD patients.

6.5. Total Cholesterol

Tot. Cholesterol	<200	200 - 239	>240
DVD	6	2	-
SVD	-	1	-
TVD	27	2	4

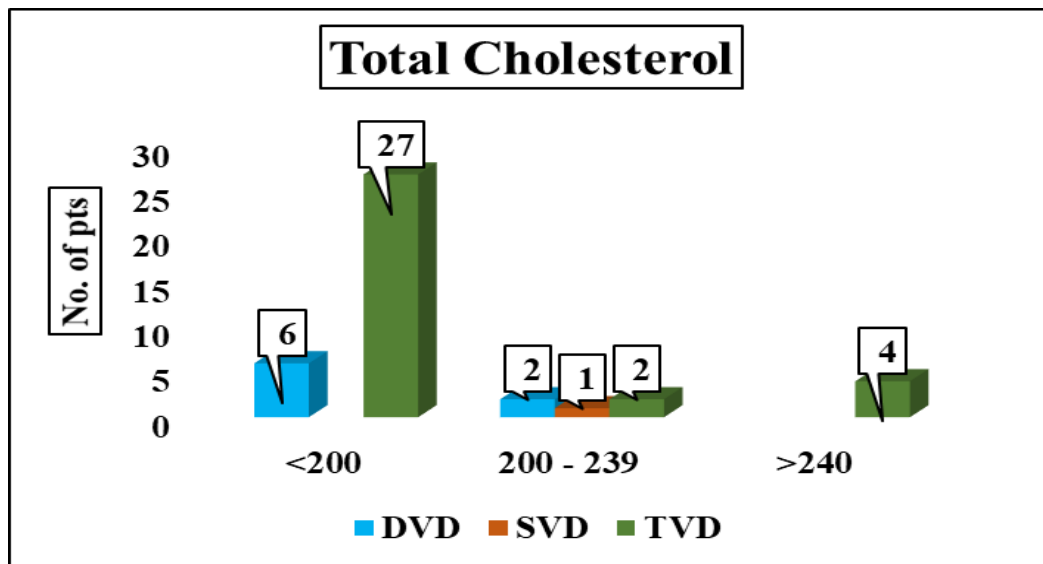


Fig 6.5: Total cholesterol Distribution Based on Severity of CAD

Higher total cholesterol levels were associated with advanced coronary artery disease, supporting its role in disease progression.

6.6. LDL / HDL Ratio

LDL/HDL Ratio	<1.5	1.5 - 3.5	>3.5
DVD	-	6	2
SVD	-	1	-
TVD	3	18	12

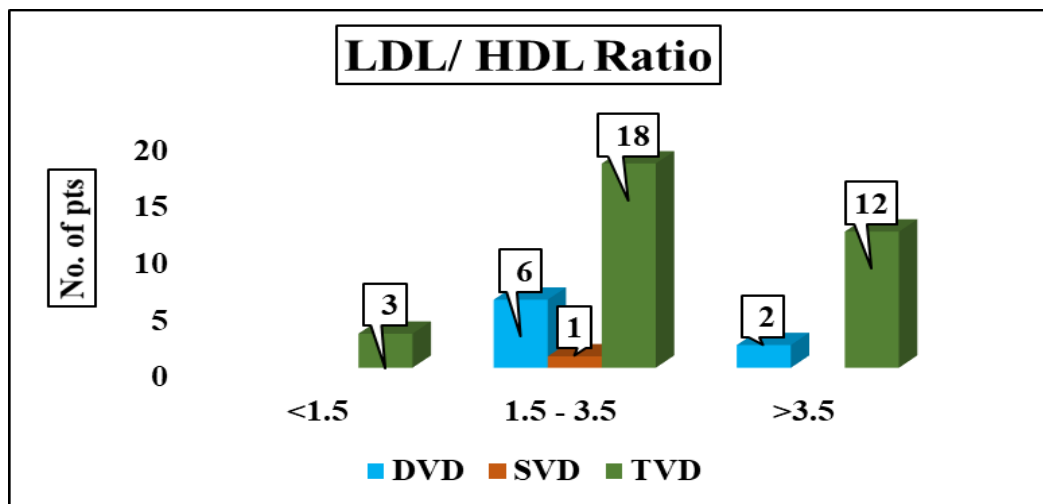


Fig 6.6: LDL/HDL Ratio Distribution Based on Severity of CAD

An increased LDL/HDL ratio was strongly linked to severe coronary artery disease, making it a reliable predictor of cardiovascular risk.

6.7. CHO/HDL Ratio

CHO/HDL Ratio	<3.5	3.5 - 5	>5
DVD	1	4	3
SVD	-	1	-
TVD	3	16	14

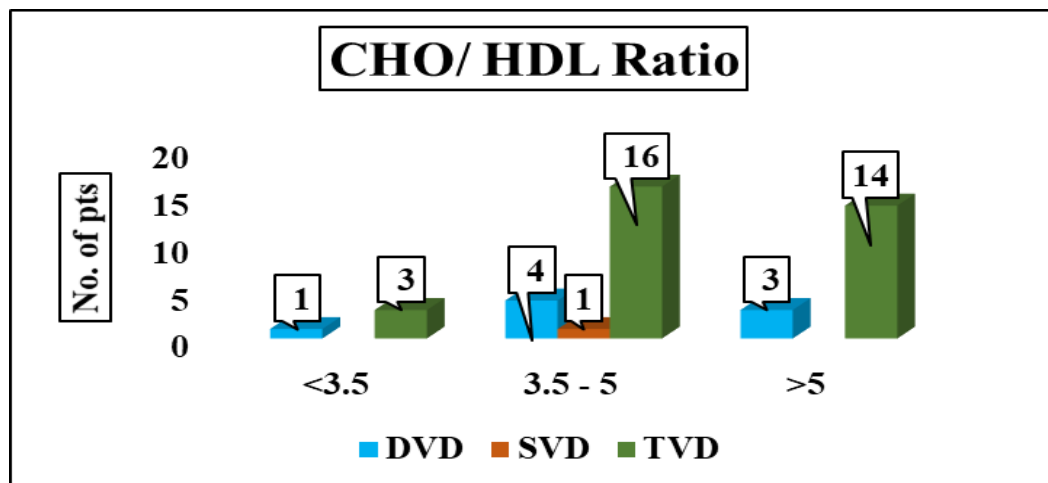


Fig 6.7: CHO/HDL Ratio Distribution Based on Severity of CAD

An elevated CHO/HDL ratio was associated with higher atherosclerotic burden and increased disease severity.

3. Discussion

The present retrospective observational study provides important insights into the clinical profile, disease severity, lipid abnormalities, and outcomes of female patients undergoing Coronary Artery Bypass Grafting (CABG). During the 11-month study period, female patients constituted a distinct subset of individuals requiring surgical revascularization, with a total of 98 women undergoing CABG (8). Within this female CABG cohort, the prevalence of advanced coronary artery disease was notably high (7).

Age-wise analysis revealed that 43.9% of female CABG patients were aged 61–70 years, followed by 34.7% in the 51–60-year age group, indicating that the highest prevalence of CABG occurred among elderly women. This age distribution reflects delayed clinical presentation and cumulative exposure to cardiovascular risk factors in women, leading to advanced disease requiring surgical intervention (5, 6).

Angiographic findings demonstrated that Triple Vessel Disease (TVD) was present in 76.5% of female CABG patients, making it the most prevalent coronary disease pattern in this study. In comparison, Double Vessel Disease accounted for 19.4%, while Single Vessel Disease was observed in only 3.1% of patients. Critical left main disease was rare (1.0%). The predominance of TVD underscores the high prevalence of severe, diffuse coronary artery involvement among women selected for CABG (10,12).

Comorbidity analysis revealed a very high prevalence of diabetes mellitus (88.8%) and hypertension (76.5%) among female CABG patients. These findings highlight the central role of metabolic disorders in accelerating atherosclerosis and contributing to multivessel disease in women. Other comorbidities such as hypothyroidism (22.4%), chronic kidney disease (6.1%), and COPD (6.1%) were less prevalent but likely contributed to increased perioperative risk [\(9,10\)](#).

The overall mortality prevalence in the study population was 7.1%, with deaths occurring predominantly in patients aged ≥ 61 years. The highest mortality prevalence was observed in the 61–70-year age group (11.6% within that age group), indicating that increasing age significantly influences postoperative outcomes. Cardiogenic shock, including refractory cardiogenic shock, accounted for 71.4% of all deaths, reinforcing that cardiac-related complications remain the leading cause of mortality following CABG in female patients [\(8,9,13\)](#).

Lipid profile assessment revealed a high prevalence of dyslipidemia among patients with severe coronary artery disease. Elevated LDL (>160 mg/dL), triglycerides (>200 mg/dL), VLDL (>40 mg/dL), total cholesterol (>240 mg/dL), and adverse lipid ratios (LDL/HDL >3.5 and TC/HDL >5) were predominantly observed in patients with TVD. Additionally, low HDL levels (<40 mg/dL) were most prevalent in TVD patients, reinforcing the inverse relationship between HDL and disease severity. Collectively, lipid abnormalities were most prevalent among patients with advanced multivessel disease, emphasizing their role in disease progression [\(14\)](#).

Overall, the study demonstrates a high prevalence of advanced coronary artery disease, metabolic comorbidities, and dyslipidemia among female patients undergoing CABG, highlighting the need for early identification and aggressive management of cardiovascular risk factors in women

4. Conclusion

This study highlights that women undergoing CABG predominantly present with advanced, multivessel coronary artery disease, accompanied by a heavy burden of metabolic comorbidities and adverse lipid profiles. The predominance of triple vessel disease, high prevalence of diabetes and hypertension, and age-related increase in mortality underscore delayed detection and under-recognition of cardiovascular risk in women. The strong association between dyslipidemia and disease severity further reinforces the critical role of lipid abnormalities in the progression of coronary artery disease. Collectively, these findings emphasize the urgent need for sex-specific risk stratification, early screening, and aggressive preventive strategies to reduce disease severity and improve surgical outcomes among women with coronary artery disease.

Reference

- [1] Vijayalakshmi IB, Nemani L, Kher M, Kumar A. The Gamut of Coronary Artery Disease in Indian Women. *Indian Journal of Cardiovascular Disease in Women*. 2023 Mar 1;8(1):43-51.
- [2] Loitongbam L, Surin WR. The Rising Burden of Cardiovascular Disease and Thrombosis in India: An Epidemiological Review. *Cureus*. 2024 Nov 15;16(11).
- [3] Krishnan MN. Coronary heart disease and risk factors in India—On the brink of an epidemic?. *Indian heart journal*. 2012 Jul;64(4):364.
- [4] Prabhakaran D, Jeemon P, Roy A. Cardiovascular diseases in India: current epidemiology and future directions. *Circulation*. 2016 Apr 19;133(16):1605-20.
- [5] Panahiazar M, Bishara AM, Chern Y, Alizadehsani R, Islam SM, Hadley D, Arnaout R, Beygui RE. Gender-based time discrepancy in diagnosis of coronary artery disease based on data analytics of electronic medical records. *Frontiers in Cardiovascular Medicine*. 2022 Nov 24;9:969325.
- [6] Cho L, Kibbe MR, Bakaeen F, Aggarwal NR, Davis MB, Karmalou T, Lawton JS, Ouzounian M, Preventza O, Russo AM, Shroyer AL. Cardiac surgery in women in the current era: what are the gaps in care?. *Circulation*. 2021 Oct 5;144(14):1172-85.
- [7] Gaudino M, Chadow D, Rahouma M, Soletti GJ, Sandner S, Perezgrovas-Olaria R, Audisio K, Cancelli G, Bratton BA, Fremes S, Kurlansky P. Operative outcomes of women undergoing coronary artery bypass surgery in the US, 2011 to 2020. *JAMA surgery*. 2023 May 1;158(5):494-502.
- [8] Nardi P, Pisano C, Bassano C, Bertoldo F, Buioni D, Labriola V, Salvati AC, Scognamiglio M, Altieri C, Ruvolo G. The role of the female gender on mid-term outcome after coronary artery bypass grafting: a retrospective study. *Journal of Thoracic Disease*. 2024 Feb 4;16(2):862.
- [9] Dumitriu LaGrange D, Tessitore E, Reymond P, Mach F, Huber C. A systematic review and meta-analysis of differences between men and women in short-term outcomes following coronary artery bypass graft surgery. *Scientific Reports*. 2024 Sep 5;14(1):20682.
- [10] Dayan V, Montero JA, Hernandez M, Sosa C, Cubas S, Urso S, Sadaba R, Freemantle N. Long-term mortality after coronary surgery in women patients depend on diabetes and age. *Interdisciplinary CardioVascular and Thoracic Surgery*. 2025 Apr;40(4):ivaf069.
- [11] Mahalle N, Garg MK, Naik SS, Kulkarni MV. Study of pattern of dyslipidemia and its correlation with cardiovascular risk factors in patients with proven coronary artery disease. *Indian journal of endocrinology and metabolism*. 2014 Jan 1;18(1):48-55.
- [12] Wester ML, Soliman-Hamad MA, von Meijenfeldt D, Maas AH, ter Woorst JF. Coronary artery bypass grafting in women: a review of literature. *Vessel Plus*. 2025 Dec 12;9:N-A.

- [13] Subramanian G, Muthusamy P, Kaliyamurthy T, Ganesan M. Difference of Coronary Artery Disease in Women and Men in Recent Trials. *Indian Journal of Cardiovascular Disease in Women*. 2025 Feb 26:1-7.
- [14] Mahalle N, Garg MK, Naik SS, Kulkarni MV. Study of pattern of dyslipidemia and its correlation with cardiovascular risk factors in patients with proven coronary artery disease. *Indian journal of endocrinology and metabolism*. 2014 Jan 1;18(1):48-55.