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Study of Clinical Profile of Coronary Artery Disease in Tertiary Care Hospital with Special Reference to Syndrome X

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HIGHLIGHTS

- Clinical Profile Reveals Diverse CAD Presentations.
- Syndrome X Shows Unique Diagnostic Challenges.
- Tertiary Care Hospital Provides Crucial Insights.
- Risk Factors Significantly Influence Disease Outcomes.
- Study Emphasizes Early Detection And Management.

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ABSTRACT

Introduction:

Coronary artery disease (CAD) remains a major contributor to global morbidity and mortality, particularly in low- and middle-income countries such as India. While CAD is typically attributed to atherosclerotic obstruction of epicardial vessels, a subset of patients present with anginal symptoms and ischemia despite near-normal coronary angiography, termed Syndrome X (microvascular angina). This study was undertaken to evaluate the clinical profile of CAD patients with special reference to Syndrome X in a tertiary care setting.

Material and Methods:

This was a prospective observational study conducted from July 2023 to June 2025 in a tertiary care hospital. A total of 200 patients presenting with acute coronary syndrome-like symptoms (chest pain, palpitations, syncope) and relevant electrocardiographic or biochemical changes were included. Patients were assessed through demographic parameters, risk factors (hypertension, diabetes, hyperlipidemia, obesity, addictions, diet), clinical signs, biochemical markers, and outcomes. Syndrome X was defined using NCEP ATP III criteria for metabolic syndrome. Statistical analysis was performed to identify associations between risk factors, Syndrome X, and clinical outcomes.

Results:

The mean age group affected was 61–75 years (45.5%), with male predominance (65.5%). Chest pain was the most common presenting symptom (99%). Major comorbidities included hypertension (54.5%), hyperlipidemia (57%), and obesity (overweight/obese 70.5%). Syndrome X was identified in a significant subset, more common among females. Outcomes showed that 30.5% were referred for coronary angiography after thrombolysis, 24.5% were discharged after thrombolysis and anticoagulation, while 17.5% succumbed during hospitalization.

Conclusion:

CAD predominantly affects older males, with hypertension, hyperlipidemia, and obesity being major contributors. Syndrome X, though under-recognized, was prevalent, particularly in women, carried important prognostic implications. Early identification of metabolic syndrome in CAD patients is crucial for timely interventions to improve outcomes.

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INTRODUCTION

Cardiovascular disease (CAD) is a complex and multifaceted disorder that has emerged as a leading cause of morbidity and mortality worldwide, with a particularly alarming rise in low- and middle-income nations such as India. Coronary artery disease, also referred to as coronary heart disease (CHD), is a type of cardiovascular disease that primarily affects the heart and its blood vessels [1]. This rising trend is largely attributed to the growing prevalence of modifiable risk factors, including dietary imbalances, tobacco use, physical inactivity, and, most importantly, metabolic syndrome [2].

Traditionally, coronary artery disease has been attributed to atherosclerosis in the epicardial coronary arteries, where plaque buildup obstructs blood flow. However, recent evidence suggests that a significant subset of patients presents with ischemic symptoms and electrocardiographic abnormalities despite having normal or near-normal coronary angiography. These cases, once termed Syndrome X, highlight a unique clinical entity where patients show objective evidence of myocardial ischemia along with typical anginal symptoms without significant coronary obstruction [2,3].

Metabolic syndrome, also known as Syndrome X, is a cluster of interrelated metabolic abnormalities strongly linked to cardiovascular disease, type 2 diabetes, and stroke. It is characterized by insulin resistance, central obesity, dyslipidemia, and hypertension, making it a major public health issue globally. Epidemiological studies suggest that more than 25% of the global population is affected, and the prevalence is steadily increasing [4]. The pathophysiology of metabolic syndrome is complex and multifactorial, with lifestyle factors, genetic predisposition, and environmental influences contributing significantly. Insulin resistance, driven by compensatory hyperinsulinemia, plays a central role in initiating metabolic disturbances. Furthermore, chronic low-grade systemic inflammation mediated by pro-inflammatory cytokines such as TNF- α and IL-6 is strongly associated with the development and progression of metabolic syndrome [5].

Patients with the clinical features of CAD but without significant obstructive lesions on angiography are now classified under Syndrome X, a condition that often overlaps with microvascular angina [6]. The pathogenesis involves endothelial dysfunction, oxidative stress, systemic inflammation, and impaired microvascular function, all of which are closely linked with insulin resistance, obesity, dyslipidemia, and hypertension [7]. Although once considered relatively benign, recent studies indicate that patients with Syndrome X may be at an elevated risk of long-term adverse cardiovascular outcomes, particularly when metabolic syndrome is present [8,9].

Another notable aspect is the higher prevalence of Syndrome X in women, especially postmenopausal women, suggesting the involvement of hormonal changes and autonomic nervous system dysfunction in addition to metabolic disturbances. This indicates that metabolic syndrome is not merely a risk factor but also a significant etiological contributor, serving as a pathophysiological

bridge between coronary microvascular dysfunction and conventional obstructive coronary artery disease [10].

The role of tertiary care hospitals in managing such cases is particularly important, as they are equipped to handle complex presentations of CAD and associated metabolic disorders. These centers provide advanced diagnostic modalities such as echocardiography, coronary angiography, treadmill stress testing, cardiac MRI, and coronary flow reserve assessments, which help detect microvascular dysfunction that might not be apparent in routine diagnostic evaluations. Such advanced facilities allow for comprehensive evaluation and stratification of patients, thereby guiding appropriate therapeutic decisions [11].

Studying the clinical profile of CAD with emphasis on metabolic syndrome and Syndrome X is crucial for understanding the unique presentations of cardiovascular disease in metabolically vulnerable populations. Careful evaluation of these patients not only enhances diagnostic accuracy but also helps in tailoring individualized treatment strategies aimed at risk factor modification and long-term prognosis improvement. This growing recognition of Syndrome X underscores the importance of expanding diagnostic perspectives beyond traditional obstructive disease and highlights the need for early identification and intervention in metabolic syndrome to mitigate cardiovascular risk [12,13].

The aim of this study was to evaluate the clinical profile of coronary artery disease (CAD) in a tertiary care hospital, with special reference to Syndrome X. The primary objective was to study CAD in detail in this setting, focusing on its association with Syndrome X, while the secondary objective was to assess the various contributing factors and analyze the outcomes of patients diagnosed with CAD in a tertiary care environment.

MATERIAL AND METHODS

This prospective observational study was conducted at the Department of General Medicine, SRTR GMC Ambajogai from July 2023 to June 2025. Ethical approval has been obtained from the Ethical Approval Committee of SRTR GMC Ambajogai.

Study Population

The study population comprised all patients admitted to the hospital with acute coronary syndrome between July 2023 and June 2025, presenting on emergency duty with chest pain, palpitations, syncope, or other symptoms suggestive of coronary involvement and supported by electrocardiographic or biochemical changes. Patients included were above 18 years of age and provided consent for participation, while those who were non-consensual were excluded from the study, ensuring ethical and clinical relevance.

Data Analysis

Data collected in this study were compiled systematically and analyzed using descriptive and inferential statistics. Demographic variables, clinical features, risk factors, comorbidities, and outcomes were expressed in frequencies and percentages, while continuous variables were presented as mean with standard deviation. Associations between coronary artery disease, Syndrome X, and various risk factors such as hypertension, diabetes, obesity, and hyperlipidemia were evaluated through cross-tabulations. Statistical significance was determined where appropriate, allowing meaningful interpretation of clinical correlations and outcome measures across patient subgroups.

RESULTS

In this study of 200 patients with coronary artery disease, the majority (45.5%) were aged 61–75 years, followed by 28% between 46–60 years, 25% between 76–90 years, and only 1.5% were ≤45 years. Males (65.5%) outnumbered females (34.5%), and most patients were Hindus (87%) with 13% Muslims. Chest pain was the predominant presenting symptom (99%), while 1% reported chest heaviness. Associated complaints included palpitations (26%), backache (16%), sweating (13%), nausea and vomiting (12.5% each), giddiness (11%), and less frequent symptoms like breathless-

-ess, shoulder pain, uneasiness, and weakness. Only 3.5% had a past history of coronary artery disease. Diabetes mellitus was reported in 6% of patients, most commonly treated with metformin (3.5%). Hypertension was present in 54.5%, with telmisartan being the most prescribed drug (28.5%). Hyperlipidemia was noted in 57%, mainly managed with atorvastatin (51.5%). Overall, the findings highlight that coronary artery disease was most prevalent among elderly males, predominantly Hindus, with chest pain as the primary complaint and significant associations with hypertension and hyperlipidemia.

Table 1: Medical treatment taken and continued till date Vs Outcome of patients with coronary artery disease

Medical treatment taken and continued till date	Outcome (Count (%))						Total
	Died	Discharged after thrombolysis and Anticoagulation	Referred for CAG	Referred for CAG after thrombolysis	Referred for CAG after thrombolysis and anticoagulation	Referred for primary PCI	
Amlodipine 5mg od	1 (0.50%)	2 (1.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	3 (1.50%)
Antidiabetic with antiplatelet and statins	1 (0.50%)	4 (2.00%)	0 (0.00%)	4 (2.00%)	3 (1.50%)	1 (0.50%)	13 (6.50%)
Antihypertensive	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.50%)	0 (0.00%)	1 (0.50%)	2 (1.00%)
Antihypertensive and antidiabetic	1 (0.50%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.50%)
Antihypertensive and antidiabetic with statins	0 (0.00%)	1 (0.50%)	1 (0.50%)	3 (1.50%)	1 (0.50%)	0 (0.00%)	6 (3.00%)
Antihypertensive with statins	2 (1.00%)	2 (1.00%)	0 (0.00%)	4 (2.00%)	1 (0.50%)	1 (0.50%)	10 (5.00%)
Antiplatelet and statins	18 (9.00%)	12 (6.00%)	1 (0.50%)	17 (8.50%)	12 (6.00%)	2 (1.00%)	62 (31.00%)
Tb. Amlodipine 5mg od Tb. Metformin 500mgbd	0 (0.00%)	0 (0.00%)	1 (0.50%)	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.50%)
None	12 (6.00%)	28 (14.00%)	9 (4.50%)	32 (16.00%)	15 (7.50%)	6 (3.00%)	10 (51.00%)
Total	35 (17.50%)	49 (24.50%)	12 (6.00%)	61 (30.50%)	32 (16.00%)	11 (5.50%)	200 (100%)

Among CAD patients, 31% continued antiplatelet with statins, 6.5% used antidiabetic with antiplatelet and statins, and 5% used antihypertensive with statins, while 51% had no treatment; notably, untreated patients had higher adverse outcomes including 16% referred for CAG after thrombolysis, 14% discharged after thrombolysis and anticoagulation, and 6% mortality, whereas those on antiplatelet with statins had 9% deaths and 8.5% CAG referrals, underscoring the protective effect of consistent pharmacologic therapy.

Among 200 patients with coronary artery disease, 41% reported a family history of similar episodes, most commonly in fathers

(24.5%) and mothers (12%), while fewer cases were seen in brothers (3%) and sisters (1.5%); however, 59% had no such family history. Sudden cardiac death in the family was reported by only 3.5% of patients. Regarding diet, 95% consumed a mixed diet and only 5% were vegetarians. Addictive habits were present in 41.5% of patients, with alcohol use being the most common (19%), followed by alcohol with cigar smoking (10%), tobacco use (7%), and smoking alone (5.5%), whereas 58.5% reported no addictions. Overall, family history, lifestyle, and dietary factors played a considerable role in patient profiles.

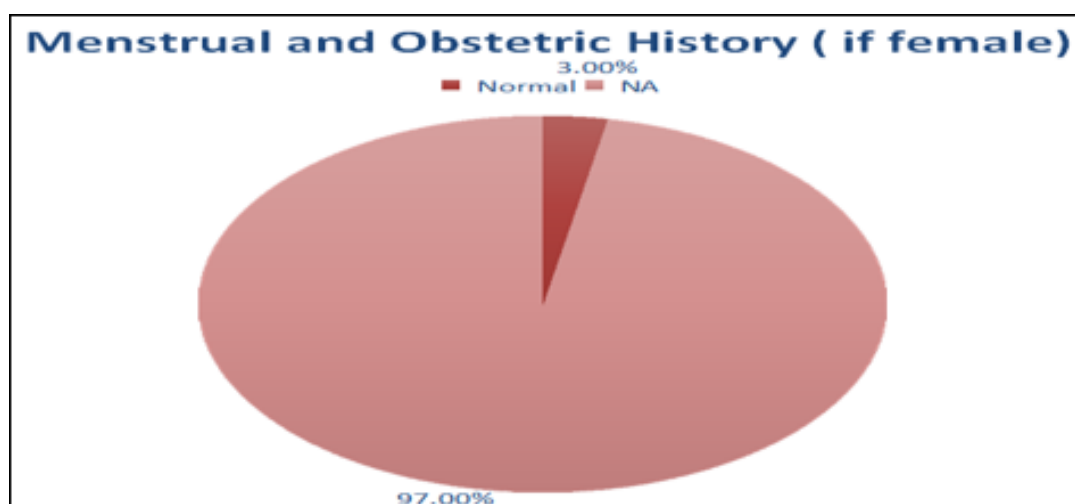


Figure 1: Distribution of Menstrual and obstetric history (if female) of patients with coronary artery disease

Only 3% of female CAD patients had a normal menstrual and obstetric history, while 97% were postmenopausal or not applicable, highlighting the predominance of postmenopausal status among women with CAD.

In this study of 200 patients with coronary artery disease, just over half (52.5%) appeared comfortable at presentation, while 42.5% were anxious and 9.5% were unconscious. Assessment of BMI showed that 33% were overweight, 29% were obese class I, 25.5%

were within the normal range, 8.5% were obese class II, 3% were obese class III, and only 1% were underweight, indicating a high prevalence of overweight and obesity. Edema was observed in 7.5% of patients, while the majority (92.5%) showed no signs of edema. Overall, most patients were stable and comfortable, with overweight and obesity being common findings.

Table 2: Jugular Venous Pressure (JVP) of patients with coronary artery disease

JVP	Count (Percentage)
Normal	185 (92.50%)
Raised	15 (7.50%)
Total	200 (100.00%)

Among CAD patients, 7.5% had raised jugular venous pressure, while the majority (92.5%) presented with normal JVP, indicating limited prevalence of right-sided heart strain or failure.

In this group of 200 patients with coronary artery disease, 27% showed evidence of atherosclerosis, 3% had arcus senilis, 1% had stiff vessels, while 69% had no visible markers. Most patients (91%) had a normal radial pulse, whereas 9% had tachycardia, and peripheral pulses were normal in 83%, with smaller proportions showing feeble regular (8.5%), feeble irregular (4%), or irregular (4%) patterns. Blood pressure assessment revealed 32.5% with elevated BP, 31% normal, 17.5% with stage 1 hypertension, 10.5%

with stage 2 hypertension, and 8.5% in shock, while none were in hypertensive crisis. Oxygen saturation was normal (95–100%) in 77.5% of patients, but 15.5% had $\text{SpO}_2 \leq 90$ and 7% were between 91–94. Ankle-brachial pressure index (ABPI) was normal in 46% and acceptable in 29.5%, while 20.5% showed some arterial disease and 4% had moderate arterial disease. Overall, the findings highlight that a significant proportion of patients presented with vascular abnormalities, blood pressure derangements, and reduced oxygenation despite many maintaining normal pulse and ABPI values.

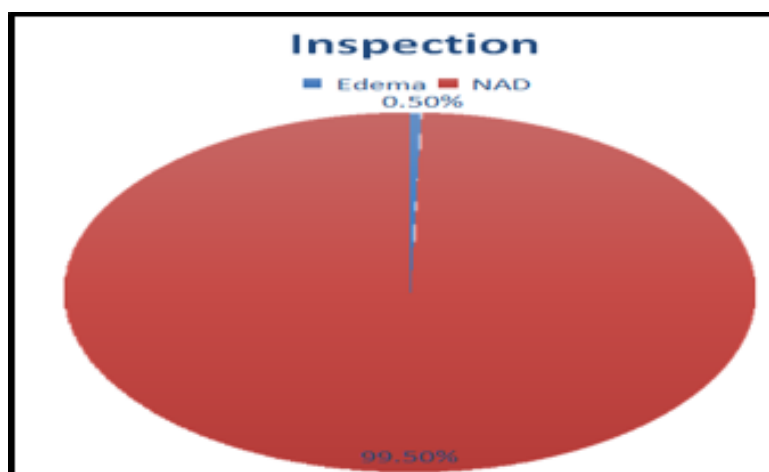


Figure 2: Distribution of Inspection of patients with coronary artery disease

On inspection, 0.5% of CAD patients showed pedal edema, while 99.5% had no acute visible abnormalities, indicating that edema was a rare finding in this cohort.

In this study of 200 patients with coronary artery disease, cardiovascular palpation revealed that 99% had no abnormality detected, while only 1% showed a heaving apex. On auscultation, 80% had normal findings, whereas 20% presented

with bilateral crepitations suggestive of cardiac failure. Regarding outcomes, 30.5% were referred for coronary angiography (CAG) after thrombolysis, 24.5% were discharged following thrombolysis and anticoagulation, 16% were referred for CAG after receiving both thrombolysis and anticoagulation, and 17.5% of patients died, reflecting the significant risk of adverse outcomes despite treatment.

Table 3: Syndrome X of patients with coronary artery disease

Syndrome X	Count (%)
Present	68 (34.00%)
Absent	132 (66.00%)
Total	200 (100.00%)

Syndrome X was identified in 34% of CAD patients, while 66% did not exhibit the condition, reflecting a substantial subset with microvascular involvement.

In this study of 200 patients with coronary artery disease, outcomes varied across age groups, with the highest burden observed in those aged 61–75 years, where 8.5% died, 12.5% were discharged after thrombolysis and anticoagulation, and 12% were referred for CAG after thrombolysis. Among patients aged 46–60 years, 10% were referred for CAG after thrombolysis and 5.5% died, while in the 76–90 year group, 7% died and 8% were referred for CAG after thrombolysis. Fisher's exact test showed no significant association between age and outcome ($p>0.05$). Syndrome X was present in 34%

overall, most commonly in the 61–75 year group (18.5%), followed by 46–60 years (8.5%) and 76–90 years (7%), but again no statistical association with age was found ($p>0.05$). When comparing outcomes by sex, 22% of males were referred for CAG after thrombolysis, 15.5% were discharged after thrombolysis and anticoagulation, and 9% died, whereas in females, 9% were discharged after thrombolysis and anticoagulation, 8.5% died, and 8.5% were referred for CAG after thrombolysis. Statistical testing revealed no significant association between sex and outcome ($p>0.05$). Overall, while trends suggest older age and male sex had slightly worse outcomes, neither age nor sex showed significant associations with outcome or syndrome X in this cohort.

Table 4: Sex Vs Syndrome X of patients with coronary artery disease

Sex	SyndromeX (Count(%))		Total
	Present	Absent	
Male	42 (21.00%)	89 (44.50%)	131 (65.50%)
Female	26 (13.00%)	43 (21.50%)	69 (34.50%)
Total	68 (34.00%)	132 (66.00%)	200 (100%)
Chi-squareP-value	0.43		

Syndrome X was present in 21% of males and 13% of females with CAD, but chi-square analysis ($p = 0.43$) showed no statisti-

cally significant association between sex and Syndrome X.

Table 5: BMI Vs Outcome of patients with coronary artery disease

BMI (kg/m ²)	Outcome (Count (%))						Total
	Died	Discharge after thrombolysis and Anticoagulation	Referred for CAG	Referred for CAG after thrombolysis	Referred for CAG after thrombolysis and anticoagulation	Referred for primary PCI	
<18.5kg/m ² (Underweight)	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 (0.50%)	1 (0.50%)	0 (0.00%)	2 (1.00%)
18.5 - 24.9kg/m ² (Normal Range)	8 (4.00%)	12 (6.00%)	2 (1.00%)	20 (10.00%)	7 (3.50%)	2 (1.00%)	51 (25.50%)
25.0 - 29.9kg/m ² (Overweight)	5 (2.50%)	12 (6.00%)	10 (5.00%)	13 (6.50%)	9 (4.50%)	7 (3.50%)	66 (33.00%)
30.0 - 34.9kg/m ² (Obese class I)	10 (5.00%)	16 (8.00%)	0 (0.00%)	21 (10.50%)	10 (5.00%)	1 (0.50%)	58 (29.00%)
35.0 - 39.9kg/m ² (Obese class II)	2 (1.00%)	5 (2.50%)	0 (0.00%)	5 (2.50%)	5 (2.50%)	0 (0.00%)	17 (8.50%)
>=40kg/m ²	0	4 (2.00%)	0	1 (0.50%)	0 (0.00%)	1	6

Outcomes varied significantly across BMI groups, with normal (10%) and class I obese (10.5%) patients more often referred for CAG after thrombolysis, while mortality was highest in class I obese

(5%); Fisher's exact test ($p = 0.022$) confirmed a statistically significant association between BMI and outcomes in CAD patients.

Table 6: BMI Vs Syndrome X of patients with coronary artery disease

BMI(kg/m ²)	SyndromeX (Count(%))		Total
	Present	Absent	
<18.5kg/m ² (Underweight)	0 (0.00%)	2 (1.00%)	2 (1.00%)
18.5 - 24.9kg/m ² (NormalRange)	14 (7.00%)	37(18.50%)	51 (25.50%)
25.0 - 29.9kg/m ² (Overweight)	16 (8.00%)	50 (25.00%)	66 (33.00%)
30.0-34.9kg/m ² (Obese class I)	27 (13.50%)	31 (15.50%)	58 (29.00%)
35.0 - 39.9kg/m ² (Obese class II)	9 (4.50%)	8 (4.00%)	17 (8.50%)
>=40kg/m ² (Obese class III)	2 (1.00%)	4 (2.00%)	6 (3.00%)
Total	68 (34.00%)	132 (66.00%)	200 (100%)
Fisher's Exact P-value	0.035		

Syndrome X was most frequent in class I obese patients (13.5%), followed by overweight (8%) and normal BMI (7%), and Fisher's exact test ($p = 0.035$) confirmed a statistically significant association between BMI and Syndrome X among CAD patients.

In this cohort of 200 patients with coronary artery disease, 6% had diabetes mellitus, with most (5.5%) being referred for CAG after thrombolysis and anticoagulation, while 1.5% were discharged after thrombolysis and anticoagulation and 0.5% died; among the 94% without diabetes, 29.5% were referred for CAG after thrombolysis and anticoagulation, 23% were discharged, and 17% died, but no significant association

was found between diabetes and outcome ($p > 0.05$). Similarly, syndrome X was present in only 1.5% of diabetics compared to 32.5% of non-diabetics, again showing no significant relationship ($p > 0.05$). Hypertension, however, was seen in 54.5% of patients and showed a significant association with outcome ($p < 0.05$): 16% were referred for CAG after thrombolysis, 14.5% discharged after thrombolysis and anticoagulation, and 12.5% died, compared with lower death (5%) and discharge (10%) rates among non-hypertensives. These findings suggest that while diabetes did not significantly influence outcomes or syndrome X, hypertension had a notable impact on patient outcomes.

Table 7: Hypertension Vs Syndrome X of patients with coronary artery disease

Hypertension	SyndromX (Count(%))		Total
	Present	Absent	
Yes	42 (21.00%)	67 (33.50%)	109 (54.50%)
No	26 (13.00%)	65 (32.50%)	91 (45.50%)
Total	68 (34.00%)	132 (66.00%)	200 (100%)
Chi square P-value	0.14		

Syndrome X was present in 21% of hypertensive and 13% of non-hypertensive CAD patients, but chi-square analysis ($p = 0.14$) showed no statistically significant association between hypertension and Syndrome X.

Among 200 patients with coronary artery disease, 57% had hyperlipidemia, and in this group 31.1% were discharged after thrombolysis and anticoagulation, 18.5% were referred for CAG after thrombolysis, and 9% died. In contrast, among

the 43% without hyperlipidemia, only 9% were discharged after thrombolysis and anticoagulation, 12% were referred for CAG after thrombolysis, and 8.5% died. Statistical analysis using Fisher's exact test showed a significant association between hyperlipidemia and patient outcomes ($p < 0.05$), indicating that hyperlipidemia plays an important role in influencing prognosis in coronary artery disease.

Table 8: Hyperlipidemia Vs Syndrome X of patients with coronary artery disease

Hyperlipidemia	SyndromX (Count(%))		Total
	Present	Absent	
Yes	38 (19.00%)	76 (38.00%)	114 (57.00%)
No	30 (15.00%)	56 (28.00%)	86 (43.00%)
Total	68 (34.00%)	132 (66.00%)	200 (100%)
Chi square P-value	0.052		

Syndrome X was seen in 19% of CAD patients with hyperlipidemia and 15% without, but chi-square analysis ($p = 0.052$) showed no statistically significant association between hyperlipidemia and Syndrome X.

In this study on patients with coronary artery disease, dietary history showed that only 5% followed a vegetarian diet, with 1.5% dying and 1.5% discharged after thrombolysis and anticoagulation, while the majority (95%) consumed a mixed diet, among whom 30.5% were referred for CAG after thrombolysis, 23% discharged after thrombolysis and anticoagulation, 16% referred for CAG after thrombolysis and anticoagulation, and 16% died. However, the association between dietary history and outcomes was not statistically significant ($p > 0.05$). Similarly, syndrome X was present in 1.5% of vegetarians and 32.5% of mixed-diet patients,

with no significant relationship ($p > 0.05$). Regarding markers of coronary heart disease, 27% had atherosclerosis, where 8.5% were referred for CAG after thrombolysis, 5.5% discharged after thrombolysis and anticoagulation, and 4% died, while 3% had arcus senilis and 1% had stiff vessels, but overall, no statistical significance was observed between markers and outcomes ($p > 0.05$) or syndrome X ($p > 0.05$). Addictions were noted in 41.5% of patients, most commonly alcohol (19%), followed by alcohol with smoking (10%), smoking alone (5.5%), and tobacco use (3.5%); however, outcomes such as death or referral for CAG and syndrome X prevalence did not show significant associations ($p > 0.05$). Blood pressure analysis revealed 32.5% patients with elevated BP, 31% with normal BP, 17.5% with stage 1 hypertension, 10.5% with stage 2 hypertension, and 8.5% in shock.

Mortality was highest in shock patients (5%), while CAG referrals were more frequent among those with elevated and hypertensive categories. Both outcome ($p < 0.05$) and syndrome X ($p < 0.05$) showed statistically significant associations with blood pressure. Finally, analysis of menstrual and obstetric history among female patients revealed that most were postmenopausal, with only a few having normal history across different age groups, and no significant association with age was found ($p > 0.05$). Overall, while dietary habits, coronary markers, and addictions did not show significant impact, blood pressure emerged as a strong determinant of both outcomes and syndrome X in coronary artery disease patients.

DISCUSSION

This study examined 200 patients diagnosed with coronary artery disease (CAD) to evaluate their demographic characteristics, clinical presentations, risk factors, treatment adherence, and outcomes. The findings demonstrate that CAD is primarily a disease of the elderly, with 45.5% of patients aged 61–75 years, followed by 28% aged 46–60 years. Only 1.5% were under 45 years, suggesting that while younger individuals are less frequently affected, rising trends of premature CAD warrant further investigation. A clear male predominance was observed (65.5% vs. 34.5%), consistent with global evidence that premenopausal women are protected by estrogen, while men are more exposed to behavioral risk factors such as smoking and alcohol consumption [14].

The clinical spectrum revealed chest pain in 99% of cases, confirming it as the cardinal presenting symptom of CAD, while palpitations (26%), backache (16%), sweating (13%), and nausea or vomiting (12.5%) represented common associated features. Only 3.5% of patients reported prior CAD, reflecting possible underdiagnosis or poor continuity of care. Diabetes was found in 6% of patients, hypertension in 54.5%, and hyperlipidemia in 57%. Statin use was common, with atorvastatin (20 mg) being the most prescribed, while telmisartan was frequently used for hypertension management. Despite the prevalence of risk factors, 51% of patients were not on any treatment at presentation, underlining poor adherence and gaps in preventive care [15].

Family history was positive in 24.5% for paternal CAD, 12% maternal, and 3.5% for sudden cardiac death, reinforcing the genetic predisposition in CAD. Lifestyle factors further contributed, with 95% following a mixed diet, 19% consuming alcohol, and 10% using both alcohol and tobacco. Among women, 97% were postmenopausal, again reflecting hormonal influence in disease susceptibility. Clinically, most patients were stable at admission, but a notable proportion had signs of acute decompensation, including hypoxia (15.5%), tachycardia (9%), edema (7.5%), and bilateral crepitations (20%), indicating heart failure [16].

Obesity was common, with only 25.5% of patients in the normal BMI range. Blood pressure analysis showed 32.5% with elevated BP and 8.5% in shock at admission. Atherosclerosis was documented in 27%, and peripheral arterial disease in 25%, pointing to systemic vascular involvement. Outcome analysis revealed that 30.5% were referred for coronary angiography (CAG) after thrombolysis, 24.5% were discharged, 16% received thrombolysis with anticoagulation, and 17.5% died, highlighting the seriousness of

CAD even with intervention [17].

Statistical analysis identified BMI, hypertension, hyperlipidemia, and blood pressure at presentation as significantly associated with outcomes and Syndrome X. Overweight and mildly obese patients were more likely to have Syndrome X, while hypertension correlated with higher mortality and complications. Hyperlipidemia strongly influenced outcomes, though its association with Syndrome X was borderline. Conversely, diabetes, diet, and addictions showed no significant correlation with either outcomes or Syndrome X. External markers such as arcus senilis and atherosclerosis also lacked predictive value [18].

Importantly, Syndrome X was present in 34% of patients, and its occurrence was significantly linked with BMI and blood pressure. Patients with elevated BP, particularly stage 1 or 2 hypertension, had higher rates of adverse outcomes and were more likely to present with Syndrome X. Age and sex did not show significant statistical associations with either outcomes or Syndrome X, suggesting that while demographic patterns exist, they are less reliable predictors than metabolic and clinical parameters [19].

Hayden MR. 2023, highlighted that CAD in a tertiary care setting is predominantly an elderly, male-driven disease with hypertension, hyperlipidemia, and obesity as leading risk factors. Poor treatment adherence significantly influenced outcomes, while BMI, blood pressure, and lipid profile emerged as critical predictors of prognosis. Syndrome X was common and strongly associated with metabolic abnormalities, underscoring the importance of early risk stratification and aggressive management of modifiable factors. Strengthening preventive strategies, patient education, and long-term follow-up can help improve clinical outcomes in CAD patients [20,21].

CONCLUSION

This study evaluated 200 patients with coronary artery disease, most of whom were males (65.5%) and aged 61–75 years (45.5%). Chest pain was the predominant symptom (99%), while palpitations (26%) and backache (16%) were common associated complaints. Hypertension (54.5%) and hyperlipidemia (57%) were frequent comorbidities, though 51% received no medical treatment. Family history was positive in 24.5% through the father. Syndrome X was observed in 34% and significantly associated with BMI, blood pressure, and hyperlipidemia. Outcomes included referral for CAG (30.5%), discharge (24.5%), and mortality (17.5%).

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