Sial Journal of Medical Sciences
ISSN Online: 2959-6939
ISSN Print: 2959-6920
Vol.3, Issue 4, 2025

ORIGINAL ARTICLE

The Number of Cases of Left Main Coronary Artery Disease Detected During Angiography

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Submission completed: March, 2025
Review began: March, 2025
Review ended: April, 2025
Accepted: April, 2025
Published: June, 2025

Abstract

Objective: The study aimed to evaluate the occurrence and pattern of left main stem (LMS) stenosis in patients undergoing coronary angiography in a tertiary care setting.

Methodology: A retrospective study was conducted in the Cardiology Department of Imran Idrees Teaching Hospital, Sialkot. After obtaining ethical and departmental approvals, data collection occurred from February to April 2024. The study involved 126 patients of both genders who underwent coronary angiography. Data was analyzed using SPSS version 25, and findings were presented in tabular format.

Results: The average age of the patients was 65 ± 18.44 years. Among the participants, 57 (45.2%) were male and 69 (54.7%) were female. The age of most of the patients (44.8%) ranged from 51–60-year. Most patients had both hypertension and diabetes mellitus (84.8%), while 8.8% had only hypertension and 4% had only diabetes mellitus. LMS stenosis was identified in 9 patients (7.2%). Of these, 5 patients (55.5%) had ostial LMS, and 4 patients (44.5%) had distal LMS.

Conclusion: The findings indicate a moderate frequency of left main stem disease among the patients, with ostial lesions being the most common type of LMS detected.

Keywords: Left Coronary Artery, Angiography, Coronary Heart Disease

Cite this Article as: *Asif H. et al, The Number of Cases of Left Main Coronary Artery Disease Detected During Angiography. ; SIAL J Med. Sci. June-2025 V-3 (Issue-4):07-10*

Author contribution:
All; conceptualization of project, data collection, writing manuscript, statistical analysis, drafting, revision and final approval.

Introduction

Main blood flow to the heart muscles is carried through two main coronary arteries, left main coronary artery and right coronary artery. The left main coronary artery supplies blood flow to the left side of the heart. Deposition of fat on the most inner wall of the coronary artery begins in early years of life and continues to accumulate throughout the life. It leads to decrease in inner diameter of the coronary artery[1]. This decrease in inner diameter hampers the blood flow to the heart muscles[2]. This blockage may be visualized by using x ray and specific dye technique called angiography[3]. When this occlusion exceeds half of the total inner diameter of the left main stem coronary artery then it is called significant left main coronary artery disease.

It usually occurs asymptomatic causing a major hindrance in its management. It may be diagnosed while performing angiography. Among the various causes leading to death, left main stem disease tops the list[4,5].

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Globally, CAD affects approximately 20 million people, with 110 million individuals suffering from the coronary heart disease (CHD). Among adults over 65, frequency of CAD is about 5%. Left Main Coronary Artery (LMCA) disease is less common, with reported incidence rates of 0.05% to 0.08%. CAD remains a leading cause of death worldwide and encompasses conditions such as Acute Coronary Syndrome (ACS), including unstable angina, ST elevation myocardial infarction (STEMI), and non-ST elevation myocardial infarction (NSTEMI). Early detection and treatment are crucial in reducing mortality6.

The prevalence of LMS stenosis in angiography patients ranges from 4% to 6%7. Although CAD was once predominantly seen in developed countries, its incidence is rising in developing nations due to lifestyle changes and urbanization. In Pakistan, CAD affects one in five middle aged individuals[8].

Angiographically, significant left main coronary stenosis is identified when there is greater than 50% narrowing or a fractional flow reserve under 0.80 at the ostium, mid-shaft, or distal bifurcation of the left main coronary artery[9,10] Around eighty percent of these significant stenoses are found at the distal bifurcation[11] .

Approximately four percent of patients who undergo coronary angiography are found to have critical left main stem stenosis, according to the studies. Literature reports a prevalence of LMS disease ranging from 3.1% to 10.5% among patients undergoing angiography.

Methodology: This retrospective study was approved ethically and departmentally. Data collection spanned from February to April 2024, involving 126 patients who underwent angiography. The study compiled and data was analyzed on patient demographics, marital status, age, and related diseases using SPSS version 25, and the number and % of cases were assessed to determine the rate of significant Left Main Stem Disease.

Results:

	Frequency	**Percentage**	**Married**
Male	57	45.2%	57
Female	69	54.7%	69
Total	126	100%	126

Table No 1: Frequency and percentage of patients undergoing angiography

	Frequency	Percentage
Male	05	4%
Female	04	3.2%
Total	09	7.2%

Table No 2: Frequency and percentage of patients undergoing angiography having significant Left main stem disease

Associated diseases	**Female**	**Male**	**%**	**Total**
Hypertension, & Diabetes mellitus	57	49	84.8%	106
Only Hypertension	6	5	8.8%	11
Only Diabetes mellitus	3	2	4%	05
Arthritis	1	1	1.6%	02
Peptic ulcer	2	0	0.8%	02
Total	69	57	100%	126

Table No 3: Frequency and percentage of patients undergoing angiography having associated diseases.

Age (years)	women	Men	%	Total
30-40	1	1	1.6%	2
41-50	13	11	19.2%	24

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51-60	33	23	44.8%	56
61-70	15	18	25.6%	32
71-80	05	04	7.2%	09
81-onward	02	0	1.6%	02
Grand total	69	57	100%	126

Table No 4: Frequency and percentage of patients undergoing angiography depending upon their age

Associated diseases	Male	Female	%	Tota l
Hypertension, & Diabetes mellitus	3	2	55.6%	5
Only Hypertension	1	1	22.2%	2
Only Diabetes mellitus	1	1	22.2%	2
Arthritis	0	0	0%	0
Peptic ulcer	0	0	0%	0
Total	5	4	100%	9

Table No 5: Association of various diseases with Left Coronary Artery Disease Osteal (55.5%) and distal (44.6%) left major coronary artery disease.

Discussions:

Shabeer et al. had identified the significant LMS stenosis in 8.7% of their patients, while Hussain et al. reported a frequency of 10.5%. In a study conducted in Peshawar-Pakistan, from twelve hundred patients. The frequency of left main coronary artery disease was 10.5%, with one hundred and twenty-six cases identified[12] .

Adverse cardiovascular outcomes are linked with the left main stem (LMS) disease, including increased mortality and morbidity. Left main stem stenosis often presents asymptomatically, which can complicate its management. Diagnosing LMS disease can be challenging because angiography may sometimes underestimate or misinterpret the degree of stenosis, especially in cases involving the ostial, distal bifurcation, or diffusely diseased segments[13].

In our study, 7.2% of patients were found to have significant LMS disease, that mirrors result from another research. For example, Shabeer et al. identified LMS disease in 8.7% of patients undergoing coronary angiography at the Armed Forces Institute of Cardiology in Rawalpindi[13]. Similarly, Hussain et al. reported LMS stenosis in 10.5% of their patients[14].

Our study revealed that 55.6% LMS patients had both the hypertension and diabetes. In contrast, 22.2% individuals had only hypertension and an equal proportion had only diabetes and the LMS symptoms. However previous studies had shown that frequency of LMS complaints varies among cases with these conditions. For example, one study reported a frequency of 13.2% in patients with diabetes and hypertension, compared with a frequency of 3.8% in patients without these conditions[15]. Another study found that patients with diabetes and hypertension had a frequency of 3.0% LMS, compared to a frequency of 1.1% in patients without diabetes and hypertension, i.e. more than five times higher than in non-diabetic patients[16].

Conclusion: Our study reveals a moderate prevalence of left main stem disease, with the majority of cases involving ostial lesions.

Recommendation: This emphasizes the need for careful assessment and management of LMS stenosis, particularly in patients with underlying conditions such as hypertension and diabetes mellitus.

Budget: Nil
Disclaimer: None
Conflict of Interest: None
Source of Funding: None

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