

ORIGINAL ARTICLE

Frequency and Pattern of Left Main Stem Stenosis in Patients Undergoing Coronary Angiography.

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Abstract

Background: To find out the frequency and pattern of left main stem (LMS) stenosis among patients who had coronary angiography in a tertiary care hospital.

Methodology: The cross-sectional observational study was carried out for the duration of six months. Total number of 123 patients referred for coronary angiography to the department of cardiac catheterization (Cath Lab). All patients underwent coronary angiography, diagnosis of LMS stenosis was made. Pattern of LMS (ostial or distal) and vessel involvement was also observed.

Results: Mean age of patients was 51.12 ± 10.44 years. There were 81 (65.85%) males and 42 (34.15%) female patients. There were 39 (31.71%) obese, 50 (40.65%) patients were diabetics, hypertension was found in 83 (67.48%) patients, and 46 (37.40%) were smokers. LMS disease was found in 15 (12.20%) patients. Ostial LMS was found in 05 (4.07%) and distal LMS in 10 (8.13%) patients.

Conclusion: There is a high prevalence of left main disease. Majority of patients with LMS have distal lesions.

Keywords

Left Main Stem, Stenosis, Coronary Angiography.

Introduction

Coronary artery disease (CAD) is the common cause of mortality and morbidity in the developed world as well as in the developing world¹. CAD was thought to be the disease of developed world but now its prevalence is increasing in developing countries too even after new advancements in diagnostic and therapeutic procedures due to lifestyle changes and rapid urbanization². Every 5th middle aged person in Pakistan is having CAD³.

Left main coronary artery is a major blood supply to the left ventricle. It supplies to more than two thirds of the heart muscle⁴. A significant left main stem (LMS) stenosis is labelled when there is a reduction of more than 50% of the vessel diameter. LMS disease is found isolated as well as associated with multivessel CAD. LMS stenosis with multivessel disease is found in about 70% of the patients^{4,5}. LMS disease carries a high risk of death and adverse outcomes^{5,6}.

It is reported in literature that approximately 5% of patients who had coronary angiography had LMS disease, while total occlusion of LMS is quite uncommon almost incompatible with life⁷. A study conducted by Shabeer et al. reported significant LMS stenosis in 8.7% patients who underwent coronary angiography⁸. Another study conducted by Hussain et al. reported LMS stenosis in 10.5% patients⁹. Another study by Rauniyar et al. found LMS stenosis in only 3.1% patients undergoing angiography¹⁰.

Our hospital is the largest setup in the South Punjab region. There was very limited study done on this subject in this region. The aim of the present study is to find out the frequency of LMS stenosis in patients undergoing coronary angiography in the population of South Punjab. We know that LMS stenosis is of high importance, because it supplies blood to the 84% of the myocardium¹¹. So, this study result will help us to determine the magnitude of LMS stenosis in our patients of South Punjab.

Methodology

This observational cross-sectional study was carried out at Chaudhary Pervaiz Elahi Institute of Cardiology, Multan from 1st of November 2021 to 30th of April 2022. The sample size is calculated by taking expected frequency of LMS stenosis in 8.7% patients undergoing coronary angiography⁸, at desired precision level of 5.0% and confidence interval 95% the calculated sample size is 123 patients. This sample size was calculated using epi-tools online software for sample size calculation.

After taking approval from the Ethical Review Board of the hospital and taking informed consent, a total of 123 patients undergoing coronary angiography of age 30 to 80 years and both genders were included in the study. Patients with already known spectrum of CAD and those with aberrant origin of LMS or absent LMS, thus having separate origin of left anterior descending (LAD) and circumflex arteries were excluded from study. Patients having >50% narrowing of the lumen as compared to proximal and/or distal lumen of left main coronary artery on coronary artery on visual by at least two cardiologists, on coronary angiography were labelled as having LMS stenosis. Pattern was divided on basis of angiography into isolated LMS stenosis or associated with other vessels and either it could be either ostial LMS Disease, involving first 3mm of LMS or distal LMS disease, involving rest of LMS after ostium. The demographic details of each patient such as gender, age, history of smoking, hypertension, diabetes, and family history of CAD was collected via a Performa.

The collected information was analyzed with SPSS 23. The mean and standard deviation for continuous variables like age were calculated. Categorical variable i.e., gender, diabetes, hypertension, family history, dyslipidemia, smoking and LMS stenosis were described via frequency and percentages. Effect modifiers like age, gender, BMI, diabetes, hypertension, family history and smoking were controlled by stratification and Chi-square test was applied. <0.05 was taken as significant effect.

Results

Total 123 patients were included in the study. Mean age of patients included in this study was 51.12 ± 10.44 years. There were more males as compared to the females. There were 81 (65.85%) males and 42 (34.15%) female patients. There were 39 (31.71%) obese, 50 (40.65%) patients were diagnosed with diabetes, 83 (67.48%) patients were hypertensives, 46 (37.40%) out of 123 patients were smokers, dyslipidemia was found in 35 (28.46%) and family history of CAD was found in 27 (21.95%).

Table 1 shows the frequency of LMS disease in our studied population and pattern of LMS disease. Stratification of presence of LMS was done by dividing the study population into age groups of 30 to 50 years and 50 to 80 years and results were not significant. There was no significant association of any gender with LMS disease.

Table 1: Frequency of LMS disease and pattern of LMS disease

Variables	n (%)	
LMS Disease	Yes	15 (12.20)
	No	108 (87.80)
Pattern of LMS Disease	Isolated LMS	4 (26.67)
	LMS with multivessel CAD	11 (73.33)
	Ostial LMS	5 (33.33)
	Distal LMS	10 (66.67)

Table 2 shows the post stratification results of LMS disease with other risk factors of CAD.

Table 2: Stratification of presence of LMS disease with risk factors of CAD

Risk Factors	LMS disease		P-Value
	Yes	No	
Diabetes	11(22)	39(78)	0.02
Hypertension	9(10.8)	74(89.2)	0.50
Dyslipidemia	4(11.4)	31(88.6)	0.86
Smoking	7(15.2)	39(84.8)	0.43
Family history	3(11.1)	24(88.9)	0.84
Obesity	6(15.4)	33(84.6)	0.46

* Variable represented as n (%)

Discussion

Left main stem (LMS) disease is associated with more adverse cardiac events, increased mortality and morbidity.¹² LMS stenosis is asymptomatic many times and presents in an unpredictable manner causing diagnostic and management challenges¹³. Diagnosis of LMS disease is not easy. Angiography may underestimate or overestimates the degree of stenosis in LMS especially in cases of

ostial, distal bifurcation, and diffusely diseased segments¹⁴.

In our study significant LMS disease was diagnosed in 12.20% patients. A study conducted by Shabeer et al. in Armed Forces Institute of Cardiology, Rawalpindi reported significant LMS stenosis in 8.7% patients who underwent coronary angiography⁸. Another study conducted by

Hussain et al. reported LMS stenosis in 10.5% patients⁹. Our study also shows comparable results. The isolated LMS lesion is found in only 6% to 9% of patients, whereas LMS with multivessel disease is found 70% to 80% of patients also have multivessel CAD⁴⁻¹⁰. In our study isolated LMS was found in 26.67% patients which was comparatively very high, and 73.33% patients were having involvement of other vessels. In present study, majority of patients 66.7% were being involved of distal involvement and remaining 33.3% were having ostial involvement.

There is another important finding in our study. Most of our patients with LMS disease are diabetics. Out of 15 patients with LMS 11 have diabetes. Parvin et al showed LMS lesion is more prevalent in diabetic patients (p 0.031)¹⁵. Muataz et al also showed similar results¹⁶. This predicts that diabetes is associated with more aggressive and dangerous LMS lesions.

Our study also has limitations. First our study was confined to patients referred for coronary angiography so real prevalence of LMS lesion in the general population remains unknown. Secondly, our study has small sample size. The need of time is such studies must be carried out in larger population at multiple centers. This study could serve as the basis of similar studies on larger basis.

Conclusion

There is a high prevalence of LMS disease. Majority of patients with LMS have distal lesions. Diabetes is a prevalent risk factor in patients with LMS disease.

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