CLINICAL PRESENTATION OF PATIENTS WITH SIGNIFICANT LEFT MAIN STENOSIS.

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ABSTRACT… Objectives: Our objective was to evaluate the frequency of clinical presentation in patients with angiographically documented significant LMCA stenosis. Study Design: Cross sectional study. Setting: Department of Cardiac Catheterization and Interventional Cardiology, Punjab Institute of Cardiology Lahore. Period: Six Months from July to December 2018. Results: The mean age of presentation of disease was 59.78±5.76 year, 100 being males (58.82%) and 70 females (41.18%). Regarding frequency of distribution of symptoms, the most common symptom was chest pain. ST segment depression was most common finding (52.94%) on ECG. 50% of patients presented with stable angina, 29.41% with unstable angina, 8.82% with NSTEMI and 11.76% with STEMI. 40% had pulmonary edema at initial presentation. Conclusion: LMCA stenosis is more common in males associated with severe disease in other coronary arteries. Isolated left main disease is rare and is more common in females as compared to males. Atherosclerosis was the major cause LMCA stenosis in the studied population. Severe forms of angina along with diffuse ST depression in multiple ECG leads are common findings in patients with LMCA stenosis.

Key words: Acute Coronary Syndromes, Atherosclerosis, Left main coronary artery stenosis, Risk factors of coronary artery disease.

INTRODUCTION

Left Main Coronary Artery (LMCA) originates from the aorta just above the left cusp of the aortic valve. It runs for 1 to 25mm and then divides into left anterior descending artery and the left circumflex artery.¹ LMCA disease was reported first time by Herrick in 1912.² LMCA stenosis is a relatively uncommon presentation of symptomatic coronary artery disease.³ Multiple studies have emphasized the importance of LMCA stenosis being an independent predictor of increased morbidity and mortality among patients with coronary artery disease.³

Prevalence of left main coronary artery (LMCA) stenosis varies from 2.5 to 10%,⁴ and prevalence of LMCA stenosis in our population is similar to that reported in the international studies.⁵ Significant (>50%) LMCA stenosis is usually accompanied with disease in two or three of the major epicardial arteries, and middle or distal segments are more commonly involved. Isolated lesions, mostly ostial, are rare coronary angiographic findings.⁶

Although Left Main Coronary Artery has certain anatomic and histologic characteristics, which distinguish it from the distal coronary arterial tree, when it comes to causes, atherosclerosis remains the most important cause of severe coronary artery stenosis. Other causes of LMCA stenosis are embolus from vegetations, dissection, spasm, tumors, thrombi, inflammation, syphilis, damage following aortic valve replacement and iatrogenic insult to the artery caused by angioplasty of the proximal LAD.⁷

Clinically significant LMCA stenosis usually presents with severe forms of angina; especially crescendo angina and unstable angina of shorter duration are frequent findings. It has been documented that clinical features and angiographic findings are important in risk stratification of patients with significant left main coronary artery stenosis into low or high
risk groups, as severity of symptoms is a useful prognostic marker in conjunction with arteriographic findings. Chest pain at rest, ST-T changes on resting ECG, cardiomegaly on chest X-ray, a history of heart failure and finding of left ventricular dysfunction at cardiac catheterization, are documented predictors of poor prognosis in patients with significant left main coronary artery stenosis.

Medical management, without revascularization in patients with significant LMCA stenosis has poor prognosis. Therefore in most centers, the significant LMCA stenosis is regarded as life threatening condition and urgent revascularization is recommended. Angioplasty of unprotected LMCA stenosis is controversial, although recently, in some centers performing large number of interventions, angioplasty & stenting of unprotected LMCA stenosis has shown acceptably good results. However on account of survival benefits with surgery, Coronary Artery Bypass Grafting remains the therapy of choice for patients with significant LMCA stenosis.

The purpose of the study was to evaluate the frequency of clinical presentation in patients with angiographically documented significant LMCA stenosis.

Angina Pectoris
Is term used to describe the syndrome of chest discomfort resulting from myocardial ischemia. Clinically patient presents with chest pain or angina like symptoms e.g. palpitations, shortness of breath or presyncope.

Stable Angina
Is no substantial change in anginal or angina like symptoms over several weeks, we term it as stable angina.

Unstable Angina
Is when symptoms pattern worsen abruptly, increase in frequency and distribution.

Myocardial Infarction
Non–ST Segment Elevation MI (NSTEMI)
In it increasing ischemic symptoms are associated with T–wave inversion and or ST segment depression. It is distinguished from unstable angina by the presence of elevated serum levels of cardiac biomarkers.

ST Segment Elevation MI (STEMI)
It is diagnosed when ischemic symptoms are associated with new ST segment elevation in two or more contiguous leads, or new onset LBBB with elevated levels of cardiac biomarkers.

Pulmonary Oedema
Pulmonary rales due to accumulation of fluid in pulmonary interstitium and alveoli from high left atrial pressures. Clinically patient presents with severe shortness of breath and orthopnea. On auscultation there will be gallop rhythm and basal crackles in the chest.

MATERIAL AND METHODS
The study was conducted at department of Cardiac Catheterization and Interventional Cardiology, Punjab Institute of Cardiology Lahore. Cardiac Catheterization and Interventional Cardiology Department of Punjab Institute of Cardiology comprises of four catheterization laboratories well equipped with latest apparatus.

It was a hospital based Cross- sectional survey.

Duration of study was 6 month.

The calculated sample size was 170 cases.

Non- probability purposive sampling.

All patients having more than 50% stenosis of LMCA during coronary angiography.

Patients having age more than 25-years.

Patients of both sexes.

Those who already had undergone Coronary Artery Bypass Grafiting or Angioplasty.

Patients presented at Department of Cardiac Catheterization and Interventional Cardiology of Punjab Institute of Cardiology for coronary angiography, after ruling out any contraindication to the procedure, were subjected to detailed
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Coronary Angiography was performed from femoral or radial approach under local anesthesia (lignocain 2%). 6 French left judkins catheter was used for left coronary artery, while 6 French right judkins catheter was used for right coronary artery. Left ventriculography was done with 6 French Pigtail catheter. 75% urographin was used as contrast media.

Patient’s electrocardiogram and arterial pressure were monitored during whole procedure.

Before cannulation of LMCA ostium, a non-selective injection was given in left aortic sinus in antero-posterior projection to evaluate the LMCA.

Pressure damping on pressure tracing was carefully recorded on engagement of LMCA ostium.

After diagnosis of LMCA stenosis was made, additional angiographic views were limited, usually LAO cranial and RAO caudal views were sufficient to illustrate completely the extent of disease in left coronary system and LAO for right coronary system.

50% or more narrowing of LMCA was regarded as significant stenosis.

Patient having LMCA stenosis, after homeostasis of puncture site, were shifted to coronary care unit and were monitored closely for next 12-hours for any complications.

Patients with more than 50% stenosis of LMCA were included in the study.

170 patients included in the study which were selected from 500 patients undergoing coronary angiography during the study period. They were evaluated in detail for their clinical presentations after coronary angiography by the researcher. Patients were asked for chest pain (onset, character, duration and severity), shortness of breath, palpitations and presyncope and they were subjected to precordial and chest auscultation. ECG of these patients were taken to see for ST and T wave changes.

Data was be entered into a computer using Statistical Package for Social Sciences (SPSS) version 10.0 for windows. Categorical variables (stable angina, unstable angina, STEMI, NSTEMI and Pulmonary oedema) were mentioned as frequencies and percentages. Continues variables (age) were expressed as mean ± standard deviation (SD). As this was an observational study, so no test of significance was applied.

RESULTS

The study composed of 170 consecutive patients with significant left main coronary artery stenosis, which were selected from 500 patients undergoing coronary angiography during the study period.

All patients were of age above 25 years. There were 6 (3.52%) patients in the age range of 25-35 years, 33 (19.41%) patients in the age range of 36-45 years, 70 (41.17%) patients in the age range of 46-55 years, 43 (25.29%) patients in the age range of 56-65 years, 24 (14.12%) patients in the age range of 66-75 years. The mean age of the patients was 59.78±5.76 years (Table-I).

There were 100 males (58.82%) and 70 females (41.18%) (Table-II). Regarding frequency of distribution of symptoms, most common symptom was chest pain (86.47%). Next most common complaint was shortness of breath (52.94%). followed by palpitations (24.70%) and presyncope (19.41%). (Table-III)

Frequency of clinical findings showed that crepitations were present in 19.41%, rhonchi in 14.70%, gallop in 29.41 % and murmur in 17.64 % of patients. (Table-IV)

Most common ECG finding was ST depression(52.94%) followed by ST elevation (14.70%), T wave inversion (12.94%), Q waves (7.05%), while normal ECG was observed in 18(10.58%) of patients. (Table-V)

50% presented with stable angina, 29.41% with unstable angina, 8.82% with NSTEMI and 11.76% with STEMI. 40% had pulmonary oedema at initial
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presentation. (Table-VI)

| Age (Years) | No. | Percentage |
|-------------|-----|------------|
| 25-35       | 6   | 3.52       |
| 36-45       | 33  | 19.41      |
| 46-55       | 70  | 41.17      |
| 56-65       | 43  | 25.29      |
| 66-75       | 24  | 14.12      |
| Total       | 170 | 100        |
| Mean±SD     | 59.78±5.76 |

Table-I. Distribution of patients by age. (n=170).

| SEX      | No. | Percentage |
|----------|-----|------------|
| Male     | 100 | 58.82      |
| Female   | 70  | 41.18      |
| Total    | 170 | 100.0      |

Table-II. Distribution of patients by sex. (n=170).

| Symptoms                      | No. of Patients | Percentage |
|-------------------------------|-----------------|------------|
| Chest Pain                    | 147             | 86.47%     |
| Shortness of breath           | 90              | 52.94%     |
| Palpitations                  | 42              | 24.70%     |
| Presyncope                    | 33              | 19.41%     |

Table-III. Distribution of patients by symptoms. (n=170).

| Clinical findings             | No.  | Percentage |
|-------------------------------|------|------------|
| 1. Chest auscultaion          |      |            |
| Crepitaions                   | 33   | 19.41%     |
| Rhonchi                       | 25   | 14.70%     |
| 2. precordium auscultaion     |      |            |
| Gallop rhythm                 | 50   | 29.41%     |
| Murmur                        | 30   | 17.64%     |

Table-IV. Distribution by clinical findings. (n=170).

| ECG Findings                  | No. of Patients | Percentage |
|-------------------------------|-----------------|------------|
| Normal ECG                    | 18              | 10.58%     |
| ST depression                 | 90              | 52.94%     |
| ST elevation                  | 25              | 14.70%     |
| T wave inversion              | 22              | 12.94%     |
| Q waves                       | 12              | 7.05%      |
| Conduction defects            | 3               | 1.76%      |

Table-V. Frequency of distribution of ECG findings in patients with significant LMCA stenosis.

DISCUSSION

Prevalence of LMCA stenosis ranges from 2.5 to 10%. Significant LMCA disease is defined as greater than 50% stenosis. When present it is associated with multi-vessel CAD over 70% of time. Patients with unprotected LMCA stenosis treated medically have three years mortality rate of approximately 50%. There is no age limit for clinical presentation of LMCA stenosis. Prasad SB et al established that mean age of presentation of this disease was 68±14 year. In our study, we included patients above age 25 year and found 59.78±5.76 year to be mean age of disease presentation. Prasad SB also observed higher incidence of disease in male population. In their study 76% males had significant LMCA stenosis. In present study, out of total 170 patients, 100 (58.82%) were male and 70 (41.18%) were females.

Clinically significant LMCA stenosis if present is usually associated with severe forms of angina (NYHA class III-IV). Although there are no clinical features described that should invariably suggest the diagnosis of LMCA stenosis, however some reports delineate the presence of severe form of angina or crescendo angina pectoris, a strongly positive exercise test and calcification in the area of left main coronary artery may indicate the presence of LMCA disease. Similar to report by Lavin et al, Topaz O et al and Banim SO et al moderate to severe angina(class III-IV) was a predominant finding in all patients of the study. In contrast to Topaz et al who described angina of relatively short duration as an important finding in patients with LMCA stenosis, in the present study more than 60% of the patients were having anginal symptoms for more than 6 months. This
finding may be due to general ignorant behavior of our population. In our study the most common symptom was also chest pain (86.47%), followed by shortness of breath (52.94%), palpitation (24.70%) and presyncope (19.41%). 54% of the patients have ST depression in resting ECG and ECG is found to be normal in 19% patients. It has been reported that the resting ECG can be normal or can show variable forms of ischemia in patients with LMCA stenosis. In a recent report, Sclarovsky et al has described that left main coronary artery stenosis often manifests as diffuse ST depression in inferior precordial leads on resting ECG. In the present study we also found ST depression as a commonest finding on resting ECG. Out of 170 patients included in the study, 90 (52.94%) patients were found to have ST depression in multiple leads, T wave inversion and Q waves was found in 22 (12.94%) and 12 (7.05%) patients respectively. Strikingly, 18 (10.58%) patients showed normal resting ECG and 25 (14.70%) patients were those with ST elevation ECG changes.

Patients with LMCA stenosis are at a risk of having an unexplained high incidence of complications during diagnostic catheterization and coronary angiography. Lavine P et al and Conhon et al have described 10% and 16% mortality rate respectively, which is strikingly high. The Registry of the Society for Cardiac angiography and Interventions have indicated 0.55% mortality for coronary angiography in the presence of more that 50% LMCA stenosis. However, Samad et al in his study of 81 patients with left main disease has reported no mortality. In the present study all patients underwent coronary angiography without any major complications i.e. dissection, myocardial infarction, cerebrovascular accident, bleeding or death. This low complication rate is due mainly to adaptation of careful technique, early management of ischemia, bradycardia and hypotension during the procedure. Therefore, in the view of recent literature which suggests that if non-invasive investigations with good predictive value for left main coronary disease, the best safe guard is careful technique.

The main interest of our study lies in widespread clinical presentation of LMCA stenosis. According to international study 51.3% usually present with stable angina, 33.11% with unstable angina, and 15.6% with acute myocardial infarction. 52% may have pulmonary oedema at initial presentation. In our study 50% presented with stable angina, 29.41% with unstable angina, 8.82% with NSTEMI and 11.76% with STEMI. 40% had pulmonary oedema at initial presentation.

The CASS registry found that 3.6 percent with left main disease were without any symptoms. Compared to symptomatic patients, the asymptomatic patients on medical treatment, although had similar severity (67 versus 70 percent) and extent of disease, appeared to have the same survival benefit with CABG. The five years’ survival rate after coronary artery bypass surgery was 84% for the symptomatic patients and 88% for the asymptomatic patients. On medical treatment, 57% asymptomatic patients survived for five years compared to 58% symptomatic patients. But now recent studies show that Stenosis of LMCA is associated with poor prognosis on medical management and is an indication for early revascularization. The studies have shown improved survival in patients with LMCA stenosis who underwent CABG up till about 10 years follow up. The authors agree with the 2004 ACC/AHA task force on bypass surgery, which recommended CABG even with mild chest pain who have left main or left main equivalent disease. Percutaneous coronary intervention (PCI) can be offered in patients who are candidates for revascularization but are not suitable for CABG. Similar recommendations for CABG and PCI were made for patients with a non-ST elevation acute coronary syndrome. Therefore, the presence of LMCA stenosis is important to identify, as undetected LMCA disease may jeopardize the chances of revascularization therapy.

CONCLUSION
LMCA stenosis is more common in males associated with severe disease in other coronary arteries. Isolated left main disease is rare and is more common in females as compared to males. Atherosclerosis was the major cause LMCA
stenosis in the studied population. Severe forms of angina along with diffuse ST depression are common findings in patients with LMCA stenosis. Copyright © 22 Oct, 2019.

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