

Frequency of Left Main Coronary Artery Disease in Patient Presenting for Coronary Angiography to Cardiac Cath. Lab, Hayatabad Medical Complex Peshawar

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ABSTRACT

Background: Coronary artery diseases (CAD) are a major cause of morbidity and mortality. Patient who suffers from CAD left main stem disease is a big challenge in the world of coronary intervention. It not only increases morbidity but also increase mortality and also the economic burden on society. This study was conducted to determine the prevalence of significant left main coronary artery (LMCA) disease in patients undergoing coronary angiography in our patients.

Objective: The aim of the present study is to determine the prevalence of LMCA disease in our local population.

Study design: cross section study.

Setting: Cardiology Department Hayat Abad Medical Complex Peshawar.

Duration: May 2013 to May 2015

Methodology: A Cross Section study of 1200 consecutive patients undergoing cardiac catheterization from May 2013 to May 2015, at Hayat Abad Medical complex Peshawar in cardiology department, and information were collected prospectively regarding length of history of angina, clinical status before presentation and physical examination at admission. All available data so collected was analyzed on SPSS version 22 for frequency, mean and mode.

Results: The incidence of left main disease was 10.5 % in our study. Mean age of patients was 54.98 years. Maximum numbers of patients were between 50 to 60 years of age. There were 756 (63.0%) males and 444 (37.0%) females. Hypertensive were 576(48.0%) and diabetes were 275(22.9%). Maximum number of patients were in in CCS grade II angina that is about 92(73.0%).

Conclusion: The frequency on Left main coronary artery is quite high in our patients, which leads to increase morbidity and mortality in patients with CAD.

Keywords: Coronary artery diseases (CAD), left main coronary artery (LMCA), coronary intervention, coronary angiography.

Introduction

Coronary artery disease (CAD) is the leading cause of mortality and morbidity in the world¹. Despite advancements in the therapeutic and diagnostic approaches, the burden of CAD continued to rise in developing countries owing to rapid urbanization, smoking and change in dietary habits². In Pakistan, it is estimated that 1 in 5 middle age adults may have underlying CAD³. Good number of cases present with significant LMCA disease. Significant CAD was defined as more than 50% luminal diameter narrowing of left main stem or $\geq 70\%$ luminal narrowing of any of the three major epicardial arteries of more than 2mm diameter. Significant LMCA disease is found in 4-6% of all patients who are undergoing coronary arteriography⁴. When LMCA disease is present, it is associated with multivessel CAD in about 70% of the time^{5,6,7}. These patients have poor prognosis with medical management and benefit from early intervention.^{8,9} Although LMCA disease may be suspected from the severity of the symptoms, ST-segment elevation in AVR on 12 lead electrocardiography (ECG) or stress ECG, early appearance of ischemia on non-invasive testing or left ventricular cavity dilatation on myocardial perfusion imaging, there is currently no reliable non-invasive method for predicting LMCA disease, presently it is definitely diagnosed by Coronary arteriography¹⁰. Internationally large number of trials looked for prevalence of LMCA disease but local data regarding this subject is scanty.

Methodology

This study was conducted at Cardiology Department KGMC Hayatabad Medical Complex (HMC) Peshawar. All patients who were referred for diagnostic coronary angiography for the first time through outdoor or indoor were included in the study. Patients with prior history of coronary intervention, valvular heart disease, cardiomyopathies and renal dysfunction were excluded from the study. After informed consent patient were brought nil by mouth (NBM) to the catheterization laboratory and in case patient were diabetic, they received good hydration before and after the procedure good hydration with normal saline and if on metformin, it was hold for 48 hours before and 48 hours after the procedure. All patient had their full blood count, renal function test, liver function test, serum electrolytes and virology. Patient with creatinine more than 2 milligram per deciliter (mg/dl) and hemoglobin (Hb) less than 10 mg/dl were dropped from the study.

Patient were subjected to coronary angiography and if needed percutaneous coronary intervention (PCI) if the vessel were suitable for intervention or sent to coronary artery bypass grafting (CABG) on the bases of syntax score more than 32. All the data so collected were analyzed on SPSS version 22 for frequency, mean and mode.

Results

Out of 1200 patients 126 had left main coronary artery (LMS) disease. The incidence of left main disease was 10.5 % Figure 1.

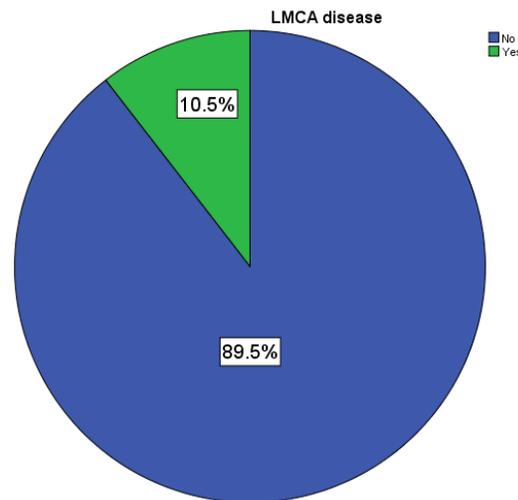


Figure 1: LMS disease prevalence

Mean age of patients was 54.98 years. Of the 126 patients, 7 (5.6%) were in the third decade, 31 (24.6%) were in the fourth decade, 47 (37.3%) were in the fifth decade, 31 (24.6%) were in the sixth decade and 10 (7.9%) were in the seventh decade. Maximum numbers of patients were between 50 to 60 years of age.

There were 756 (63.0%) males and 444 (37.0%) females. Out of 126 patients with left main disease 89 (70.63%) were males and 37 (29.36%) were females.

Hypertension was present in 576 (48.0%) and diabetes in 275 (22.9%) patients. Out of 126 patients with left main disease hypertension was present in 64 (50.8%) and diabetes in 34 (26.9%) patients.

Out of 1200 patients, 281 (23.4%) presented with Canadian Cardiovascular Society (CCS) grade I angina, 705 (58.7%) presented with CCS grade II angina, 153 (12.7%) presented with CCS grade III angina and 42 (3.5%) presented with CCS grade IV angina. Out of 126 patients with LMS disease, 10 (7.9%) presented with CCS grade I angina, 92 (73.0%) presented with CCS

grade II angina, 18(14.28%) presented with CCS grade III angina and 6(4.7%) presented with CCS grade IV angina.

Table 1. Baseline Demographic parameters of Study Population

Table I:		
Patients	Total No	Patient with LMS
Study population	1200	126
Male	756(63%)	89(70.63%)
Female	444(37%)	37(29.36%)
Hypertensive Patients	576(48%)	64(50.8%)
Diabetics	275(22.9%)	34(26.9%)
Canadian Cardiovascular Society (CCS) I	281(23.4%)	10(7.9%)
Canadian Cardiovascular Society (CCS) II	705(58.7%)	92(73.0%)
Canadian Cardiovascular Society (CCS) I	153(12.7%)	18(14.28%)
Canadian Cardiovascular Society CCS grade I	42(3.5%)	6(4.7%)

Discussion

Coronary artery disease (CHD) is the single largest cause of death in the developed countries and is one of the leading causes of disease burden in developing countries¹¹. Coronary artery disease is a new epidemic of this era¹². Left main coronary artery (LMCA) disease remains an important risk factor for increased mortality and morbidity at all stages of diagnosis and treatment of coronary artery disease.¹³ Left main stem pathology is often silent¹⁴, with unpredictable presentation: as such it poses diagnostic and management challenges. Significant (defined as a greater than 50 percent angiographic narrowing) left main coronary artery disease (LMCAD) is found in 4 to 6 percent of all patients who undergo coronary arteriography¹⁵. It is associated with multivessel coronary artery disease about 70 percent of the time¹⁶.

Identification of significant left main disease is not always easy. Angiography routinely underestimates and overestimates the degree of left main narrowing. This is particularly true for ostial, distal bifurcation, and diffusely diseased segments or in the presence of dense calcium or eccentric disease on one hand.¹⁷ On the other

hand Left main coronary artery (LMCA) stenosis is a relatively infrequent cause of symptomatic coronary artery disease,¹⁸ so patient most of the time come to medical attention very infrequently. In our part of the world where primary angioplasty is available in very few centers and most patient are taken to catheterization laboratory when they are having class III and Class IV angina, so the chance of picking the left main disease reduce further.

Coronary anomalies and coronary heart diseases together contribute about 24% to Sudden cardiac death.¹⁹ However about 40% of sudden deaths can be unwitnessed.²⁰ There is another 3 to 5 % cases which remain unexplained.²¹ What will be the contribution of coronaries in this unexplained and unwitnessed cases at present it is an open question.

During our study, we did 1200 angiography and percutaneous coronary intervention (PCI). We came across of 126 (10.5% cases of significant left main disease. The possible cause we presume of higher rate as compare to the international data²² is that, our patient's presentation is very late to the lab and during this delay they get significant changes. The average age was 54.98 years in our study and people get coronary involvement very early²³ so if start our screening at early then as in the rest of the world the figure will drop and match the international data. There were 89(70.63%) male and female remain 37(29.36%) The ratio of male and female patients were 2.4:1 in our study. The possible reason is the same that the prevalence of coronary diseases is more in male as compared to the female gender.²⁴ The diabetics were 34 out of 126 patients with left main stem disease. Non-diabetics were 96. Although diabetes is a major risk factor but mortality is 2 to 4 time high²⁵ in diabetics. The possible cause of getting the low figure in them is the same custom of late presentation and in the age group they came to us we lost a big chunk. Patient who were hypertensive with left main disease were 64(50.8%). This is very interesting relationship. Since hypertension is a late presentation as compare²⁶ to diabetics.²⁷ I 7.9% patient who were having significant Left Main CAD were in class I angina, whereas class II angina patient with significant disease were 73%, and 14.28% were in class III and 4.7 % were in CLASS IV angina. Again, if we look at the cohorts, more patients were found in the class of angina where angiography is not advised routinely and by the time they reach the catheterization laboratory we have lost most of them.

Conclusion

There is a high prevalence of left main disease which is an independent risk factor for high mortality and morbidity. Whether the present-day guidelines are enough for angiography in patients with multiple risk factors and stable angina or needs redefinition, and will be cost effective is an unanswered question.

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