



PATTERN OF CORONARY ARTERY DISEASE IN PATIENTS WITH LEFT BUNDLE BRANCH BLOCK IN ACUTE CORONARY SYNDROME

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ABSTRACT

OBJECTIVES: To determine the association of left bundle branch block with coronary artery disease.

To determine the pattern and severity of coronary artery disease with left bundle branch block.

DESIGN: Prospective descriptive study.

PLACE AND DURATION: Department of Adult cardiology, National Institute of Cardiovascular Diseases, Karachi. From October 2002 to September 2003.

PATIENTS AND METHODS: Fifty three adult patients of both sexes admitted at National Institute of Cardiovascular Disease, Karachi with acute coronary syndrome.

Fifty three patients, who were admitted at National Institute of Cardiovascular Disease, with symptoms suggestive of acute coronary syndrome and having LBBB in their ECG, were collected randomly for study. Consent was taken from the patients, their relatives and treating physician. Patient were prepared for coronary angiography after initial stabilization and selective coronary angiography was done at cardiac cath lab of National Institute of Cardiovascular Disease. Interpretation of coronary angiograms was done by two independent observers regarding number of coronary arteries involved and distribution (pattern) of coronary artery disease. Data of all patients was collected on specially designed proforma and then analysed on SPSS 10.

RESULTS: Out of 53 patients, 31 (58%) were male and 22 (41.5%) were female. Mean age of patients was 45 years. Coronary artery disease (CAD) was present in 41 (77.3%) patients and 12 (22.6%) patients had normal coronary arteries. Frequency of Single vessel disease (SVD) was most common (n=18, 33.9%) as compare to double vessel disease (DVD) and triple vessel disease (TVD) which were 16.9% (DVD) and 26.4% (TVD) respectively. Left main coronary artery was not involved.

CONCLUSION: Presence of new LBBB is significantly associated with coronary artery disease. Presence of LBBB does not predict presence of multivessel disease or involvement of left main coronary artery.

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KEYWORDS: Left bundle branch block, acute coronary syndrome, coronary angiography, coronary artery disease, multivessel disease, left main coronary artery.

INTRODUCTION

In our country, the commonest cause of CAD is atherosclerotic narrowing of coronary artery, it may be silent or symptomatic^[1]. Incidence of CAD in younger (i.e. < 38 years) population is increasing^[2]. In Pakistan younger patients are also reporting for acute coronary syndrome including myocardial infarction^[1].

Diagnosis of CAD is established through a range of different investigations including non-invasive and invasive tests. Non invasive investigations include electrocardiogram, exercise tolerance test, nuclear myocardial perfusion imaging, pharmacological nuclear stress testing, stress echocardiography (exercise as well as pharmacological), contrast echocardiography^[3], chest roentgenogram, electron beam computed tomography and magnetic resonance imaging. Invasive diagnostic testing is done by coronary angiography.

Presence of left bundle branch block predicts severe organic heart disease. It is commonly associated with coronary artery disease, hypertension and cardiomyopathy^[4]. Presence of these conduction defects in patients with coronary artery disease is often associated with impairment of left ventricular function and reflect multivessel disease and previous myocardial damage, such conduction defects are indicators of a relatively poor prognosis^[5].

Left bundle branch block is present in 3 – 5% of patients with acute myocardial infarction^[6].

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Presence of left bundle branch block in acute myocardial infarction results in diagnostic problems and subsequent underutilization of thrombolytic therapy^[7]. Acute myocardial infarction however can be diagnosed in presence of left bundle branch block when there is striking ST-segment deviation beyond that which can be explained by the conduction defect^[8].

Left bundle branch block is one of the features that are associated with higher likelihood of coronary artery disease among patients presenting with symptoms suggestive of unstable angina^[9]. In patients with unstable angina presence of left bundle branch block is an indicator of high risk^[10].

International data^[11,12,13,14,15,16] has given high degree of variability regarding angiographic characteristics in patients with left bundle branch block ranging from no coronary artery disease to multivessel disease and involvement of LMCA.

This study is designed to know the association of coronary artery disease and to confirm the hypothesis that Does presence of left bundle branch block predict severe coronary artery disease (in terms of multivessel disease or involvement of left main coronary artery (LMCA)), so that high risk group of patients can be identified and managed earlier.

PATIENTS AND METHODS

This is a prospective descriptive hospital based study, which included 53 patients. Study was conducted at department of adult cardiology, National Institute of Cardiovascular Diseases, Karachi during In this study adult patients of both sexes who presented with symptoms suggestive of acute coronary syndrome and were having left bundle branch block (QRS > 0.11s with neither q nor S in lead I, aVL & V₆) on their ECG, were collected randomly for the study with the consent of patients, their relatives and treating physician. Patients were initially stabilized and then prepared for coronary angiography.

Patients with pacemaker rhythm were excluded from this study. Patients with valvular heart disease were also excluded from this study.

Data was collected on specially designed proforma.

Angiograph was performed in three cath: labs with state of art facilities including three angiographic machines. Two angiographic machines of Toshiba model No. RJ P9211J-G11 and one machine of Philips-Integris Allura 9F.

Appropriate size sheaths, guide wires, coronary angiography catheters and other necessary tools were used during

**TABLE NO. 1:
CLINICAL CHARACTERISTICS OF PATIENTS
(N=53)**

	NO. OF PATIENTS	PERCENTAGE
AGE:		
30 – 45 YEARS	18	34%
46 – 60 YEARS	19	35.8%
> 61 YEARS	16	30.2%
SEX:		
MALE	31	58.5%
FEMALE	22	41.5%

**TABLE NO. 2:
PERCENTAGE OF DISEASED VESSELS**

Number of vessels involved	No. of patients	Percentage
Single vessel disease (SVD)	18	33.9
Double vessel disease (DVD)	9	16.9
Three vessel disease (TVD)	14	26.4

SVD = Single vessel disease.
DVD = Double vessel disease.
TVD = Three vessel disease.

**TABLE NO. 3:
COMPARISON ACCORDING TO NUMBER OF VESSELS INVOLVED**

STUDY	CAD	SVD	DVD	TVD
OUR STUDY	77.3%	33.9%	16.9%	26.4%
LASHARI MN ET AL ²⁷	84%	23%	24%	37%
SHAREEF S ET AL ²⁹	80%	25.8%	-	53.3%
MARSIE BM ET AL ³⁰	-	2%	30%	50%

SVD = SINGLE VESSEL DISEASE.
DVD = DOUBLE VESSEL DISEASE.
TVD = TRIPLE VESSEL DISEASE.
CAD = CORONARY ARTERY DISEASE.

**TABLE NO. 4:
COMPARISON ACCORDING TO TYPE OF VESSEL INVOLVED**

STUDY	CAD	LMCA	LAD	LCX	RCA
Our study	77.3%	0	71.6%	52%	45.2%
Lashari MN ²⁷	84%	13%	16%	4%	-
Sgarbossa ¹³	-	0	30%	16%	5%

CAD = Coronary artery disease.
LMCA = Left main coronary artery
LAD = Left anterior descending coronary artery
LCX = Left circumflex coronary artery
RCA = Right coronary artery

angiography.

Steps of coronary angiography were explained to the patient and consent was taken.

Appropriate size guide wires and appropriate size Judkin catheters (right and left) were used for selective coronary angiography.

Personal computer with SPSS, 10 version was used for data interpretation and analysis. The qualitative variables are presented by their percentages and compared by chi-square test of proportion. A 95% confidence interval of the variables were also calculated.

Interpretation of coronary angiogram was performed by at least two observers regarding pattern (LMCA, LAD, RCA, LCX etc) or severity of CAD (single vessel disease, double vessel disease, or multivessel disease).

RESULTS

Baseline characteristics of patients are listed in Table-1. Total 53 patients were included in this study. Out of 53 patients, 31 (58.4%) were male and 22 (41.5%) were female. Mean age of patients was 45 years.

Coronary artery disease (CAD) was present in 41 (77.3%) patients and 12 (22.6%) patients had normal coronary arteries. Two (3.6%) patients demonstrated spasm in proximal RCA.

In patients who were having coronary artery disease, SVD was most common (n=18, 33.9%), triple vessel disease (TVD) was present in 14 (26.4%) patients and double vessel disease (DVD) in 9 (16.95%) patients (Table-2).

DISCUSSION

Studies in west carried out on South Asian patients (which includes Pakistanis, Bangladeshis and Indians, show that prevalence of coronary artery disease among these patients is high^[17,18]. Studies on expatriate Indians and Pakistanis in USA have confirmed these observations^[19]. In Pakistan young patients are also reporting for acute coronary syndrome including myocardial infarction^[1]. Nearly one hundred thousand individuals suffered from an acute myocardial infarction in calendar year 2002^[20].

Presence of LBBB predicts severe coronary artery disease and reflects presence of multivessel disease or previous myocardial damage and it is an indicator of poor prognosis^[5]. LBBB is one of the features that are associated with high likelihood of coronary artery disease among patients who present with symptoms suggestive of unstable angina^[9] and is an indicator of high risk group^[10].

This study was designed to know the

association of coronary artery disease with LBBB and keeping this hypothesis in mind that presence of LBBB predicts severe coronary artery disease (in terms of multivessel disease or involvement of left main coronary artery), so that high risk group of patients can be identified and managed earlier. For this purpose 53 adult patients of both sexes with mean age of 45 years who were admitted at National Institute of Cardiovascular Diseases with acute coronary syndrome and having LBBB on their ECG were taken randomly for study.

As shown in Table-3, in our study frequency of single vessel disease was high (33.9%) as compared to double vessel disease (16.9%) and triple vessel disease (26.4%). Lashari MN et al^[21] showed in their study that single vessel disease, double vessel disease and triple vessel disease was present in 23%, 24% and 37% respectively. In study conducted by Shareef S et al^[22] single vessel disease was present in 25.8% of patients and triple vessel disease was present in 53.3% of patients. In one study, the single, double and triple vessel disease was present in 2%, 30% and 50% of patients respectively^[23].

As shown in Table-4, in our study LMCA was not involved as in study by Sgarbossa et al^[13]. Lashari MN et al^[21] showed involvement of LMCA in 13% of patients. In another study^[23] LMCA was involved in 10% of patients. Garini A et al^[16] observed that in those patients who have involvement of LMCA incidence of LBBB was high. Nishtar S^[24] showed involvement of LMCA as 3.36%.

Both national and international data is limited regarding association between LBBB and coronary artery disease, its pattern and severity. In our study we included those patients who had higher likelihood of coronary artery disease on clinical grounds (i.e. patients with acute coronary syndrome). Study conducted by Lashari MN^[21] was on patients with chronic stable angina but it was not known that how many patients had LBBB on their ECG.

Our study shows high incidence of single vessel disease in contrast to other studies and high incidence of LAD involvement, which is similar to other studies. Involvement of LMCA was not present in our study but it was variably involved in other studies. After single vessel disease, triple vessel disease was most common as compared to double vessel disease in our study as well as in other studies.

CONCLUSION

Total 53 patients were included in this study. New LBBB was most commonly associated

with coronary artery disease than old LBBB. Frequency of single vessel disease was high in this study. Involvement of LAD coronary artery was most common. There was no involvement of LMCA. Study suggests that presence of new LBBB is highly associated with CAD. Study does not favour the hypothesis that presence of LBBB with coronary artery disease in acute coronary syndrome predicts severity of coronary artery disease (in terms of LMCA, involvement or three vessel disease).

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