Original Article

IN PATIENTS WITH LEFT BUNDLE BRANCH BLOCK, SEVERITY OF CORONARY ARTERY DISEASE AND DEMOGRAPHIC FACTORS

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ABSTRACT

INTRODUCTION:Coronary artery disease (CAD) is a prevalent disorder and it is a leading cause of death all over the world. The prevalence of CAD is high in patients having LBBB and is also associated with increased mortality. Therefore the assessment of CAD may help in providing prognostic information. The study was planned to evaluate the severity of CAD in patients having LBBB.

OBJECTIVE:The objective of the study was to look for the presence and extent of CAD and characteristics of the patients having LBBB with and without CAD.

MATERIAL AND METHODS:The study was done at Punjab Institute of Cardiology, Lahore from Feb 2012 to Aug 2012. A total of 200 patients with LBBB were included in this study. Demographic variables of the patients were noted on a pre-specified proforma. Coronary angiography was performed to assess the presence, extent and severity of CAD. Significant CAD was considered if the luminal narrowing was more than 50%.

RESULTS:According to data mean age was 53.38 +9.57 years. 123 (61.5%) patients out of 200 were male and 77 (38.5%) were female. Diabetes was present in 60 (30%) and hypertension was found in 136 (68%) patients.132(66%) patients had CAD. 38 patients (19%) had severe triple vessel or Left Main Stem involvement. 63 patients (31.5%) had two vessel and 31(15.5%) patients had single vessel CAD. Left Main Stem was involved in 12(6%) of patients of LBBB. In 56.5% of patients left anterior descending artery (LAD) was involved. 43(32.6%) patients were diabetic and 94(71.2%) were hypertensive among LBBB patients with CAD. 88(66.7%) of the patients were males and 44(33.3%) were females. Mean age of patients of LBBB having CAD was 56.51±8.37 and patients without having CAD was 47.29±8.85. So, the patients with LBBB and CAD were more likely to be older and males than patients with LBBB and no CAD.

CONCLUSION:On the basis on this study, it is clear that LBBB patients have a quite high probability of severe CAD based on coronary angiography. The demographic characteristics like advanced age and male gender also help to differentiate LBBB patients with concomitant coronary artery disease from those without coronary involvement. Therefore early invasive approach in patients with LBBB should be warranted.

KEY WORDS:Coronary artery disease; Left bundle branch block; Coronary angiography.

BACKGROUND

Left bundle-branch block (LBBB) is a commonly seen abnormality in ECG of the patients and is usually associated with coronary artery disease (CAD)[1]. It is due to delayed activation of the left ventricle, which results in left ventricle to contract later than the right ventricle. LBBB results from block in intra-ventricular conduction system at any site, including the main left bundle branch, either of the two fascicles of left bundle, the distal conduction system of the left ventricle or, less commonly, the fibers of the bundle of His. It results in extensive ST-T wave and QRS changes[2].

The prevalence of LBBB in general population is high especially at advance age i-e 5.7% at 80 years and low at 50 years of age i.e 0.4%. There is a high prevalence of CAD in patients with LBBB[3]. It is also evident from the literature that in patients with CAD, LBBB is an independent predictor of mortality[4]. Old age, male gender and diabetes are the different demographic factors which are common in patients with CAD[4]. Patients having type II diabetes mellitus along with LBBB have more severe and extensive CAD than those with diabetes but without LBBB[5]. Therefore identification of CAD in patients with LBBB is very important for risk stratification and management of patients. In patients having LBBB non-Invasive stress testing has limited utility and conventional angiogram is

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usually required [6-10].

This study was planned to evaluate the severity of CAD in patients of LBBB. The purpose of this study was to assess the severity of CAD in patients of LBBB for early intervention to decrease morbidity and mortality.

MATERIAL AND METHODS:

INCLUSION CRITERIA:

All patients of 30-80 years of age male and female having LBBB.

EXCLUSION CRITERIA:

1.Patients having deranged renal function tests (serum creatinine more than 1.4mg/dl).
2.Anemic patients (Hb< 9g/dl).
3.Patients with known CAD (previous H/o PCI or CABG).

DATA COLLECTION PROCEDURE:

We enrolled 200 patients from February 2012 to August 2012 from Punjab Institute of Cardiology, Lahore. Patients who fulfilled the inclusion criteria were enrolled and then underwent coronary angiography. Informed consent was taken. Demographic data like age, sex of the patients was recorded on the proforma. Angiographic findings like presence and severity of CAD was also recorded. Angiographic and demographic data was interpreted by researcher.

RESULTS

Out of these two hundred patients, mean age was 53.38 +9.57 years and 123 (61.5%) were male and 77 (38.5%) were female. (Table 1) 136 (68%) were having hypertension and 60 (30%) of the patients were diabetic.

Table-1: Demographic variables of patients.

Characteristics		Frequency (%) (n=200)
Sex	Female	77(38.5%)
	Male	123(61.5%)
Age (years)		53.38±9.571
Diabetes		60(30%)
Hypertension		136(68%)
Diseased Vessel		
Left anterior descending artery		113(56.5%)
Left circumflex artery		88(44%)
Right coronary artery		64(32%)
Ramus Intermedius		6(3%)
Left Main Stem		12(6%)
Triple Vessel		26(13%)

TABLE 2: Demographic variables and risk factors in LBBB patients with and without CAD.

		With CAD n=132(66%)	Without CAD n=68(34%)	p-value
Age		56.51±8.37	47.29±8.85	0.001
Sex	Male	88(66.7%)	35(51.5%)	0.052
	Female	44(33.3%)	33(48.5%)	
Hypertension	Yes	94(71.2%)	42(61.8%)	0.2318
	No	38 (28.8%)	26 (38.2%)	
Diabetes	Yes	43(32.6%)	17(25%)	0.3455
	No	89 (67.4%)	51 (75%)	

Figure 1: CAD involvement

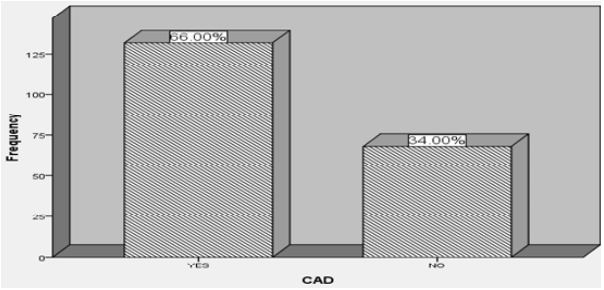
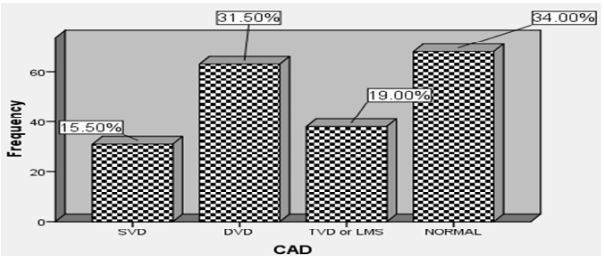


Figure 2: Graphical distribution according to severity of coronary artery disease.



132(66%) out of 200 patients of LBBB who underwent coronary angiography had CAD (Fig 1, table 2). 38 patients (19%) had triple vessel disease or LMS disease. 63patients (31.5%) had double vessel CAD and 31(15.5%) patients had single vessel CAD (Fig 2).

The location of CAD in LBBB patients is presented in Table 1. LAD was most commonly involved vessel i.e. 56.5%. Left Main Stem disease in 12(6%) of patients. CAD was present in 66% and disease was severe (left main and or TVD) in 19% of patients with LBBB. Among LBBB patients presence of CAD was stratified according to the demographic and risk factors of the patients Table 2. CAD was present in 44(33.3%) of females and 88(66.7%) were males. Mean age of patients of LBBB having CAD was 56.51±8.37 and patients

without CAD was 47.29±8.85. 43(32.6%) patients were diabetics and 94(71.2%) were hypertensive among LBBB patients. So, compared with the patients without CAD, those with CAD were older and more likely to be male.

DISCUSSION:

Among the causes of LBBB are aortic stenosis, dilated cardiomyopathy, acute myocardial infarction, extensive coronary artery disease, primary disease of the cardiac electrical conduction system, long standing hypertension leading to aortic root dilatation and subsequent aortic regurgitation and Lyme disease. [11]

Non-invasive tests have limited utility and conventional coronary angiography is required most of the times to confirm diagnosis in patients with LBBB[6-10].

Other studies also proved the presence and severity of CAD in LBBB and its demographic correlates. The prevalence of LBBB in the general population is almost 0.4% at middle age to 5.7% at old age. High prevalence of CAD has been reported in patients with LBBB as compared to those without LBBB [3].

Patients with LBBB having CAD were associated with a worse prognosis than those with LBBB without CAD [12]. In study by Ozeke et al. patients evaluated with stress nuclear testing for suspected or known CAD showed both left and right bundle branch blocks were associated with higher mortality as compared to patients without bundle branch block during long term follow-up[5].

In another study conducted in Iran, the extent of CAD was assessed in 219 patients with LBBB who had undergone coronary angiography. Coronary artery disease was present in 124(56.3%) of patients with LBBB[4]. The results from Freedman et al.[13]. showed that in the setting of chronic CAD LBBB is usually associated with extensive LV segmental wall motion abnormalities, it is not uniquely associated with a lesion of the LAD or with motion abnormality of the anterior left ventricle. Abrol R et al. studied 336 consecutive patients with LBBB referred for coronary angiography. Out of these patients, 54% had CAD[14]. Therefore those patients having coronary artery disease were older males They were more likely to have myocardial infarction, angina pectoris, diabetes mellitus and reduced systolic function of left ventricle[14]. So based on all these studies mentioned above highlighted the importance of early and aggressive evaluation in patients with LBBB.

CONCLUSION

It is concluded from this study that certain demographic characteristics like advanced age and male gender may help to differentiate left bundle branch block patients with concomitant coronary artery disease from other cases without coronary involvement. Severity of CAD is also more prevalent in patients with LBBB based on angiographic findings. So in LBBB patients early invasive approach seems warranted. This may allow for early identification of disease and avoidance of unnecessary additional testing.

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