



CLINICAL AND ECHOCARDIOGRAPHIC PROFILE OF PATIENTS OF LEFT BUNDLE BRANCH BLOCK

General Medicine

Dr.Krunal A Talsaniya Assistant professor, Department of Medicine, B J medical college & civil hospital, Ahmedabad.

Dr.Urvesh A Mistry Assistant professor, Department of Medicine, B J medical college & civil hospital, Ahmedabad. - Corresponding Author

ABSTRACT

BACKGROUND & OBJECTIVES: LBBB is often associated with underlying structural heart disease such as IHD, HTN, and idiopathic DCM. This study is an attempt to study clinical and echocardiography profile of LBBB to find various causes, severity and correlation between them.

METHODS: 50 patients who are admitted or attended OPD who has clinical features of heart disease are screened by ECG and diagnosed LBBB, are studied further. Every patients is evaluated with history, clinical examination, 2d ECHO. The results are assessed in terms of causes and severity assessed by 2d echo and their correlation.

RESULTS: LBBB is common in 7th decade & male gender. Risk factors in decreasing order are IHD, HTN, Diabetes, smoking, tobacco, and alcohol. In patients with LBBB most patients have higher grade of angina (grade 3) & NYHA class 2- class 3 failure. ECHO finding in decreasing order are Mitral Regurgitation, reduced LV compliance, septal hypokinesia, concentric LVH. LBBB is strongly associated with LV dysfunction. In our study most patients have moderate to severe LV dysfunction & increased LVID d/s.

CONCLUSION: From this study we conclude that LBBB is common in old age & male gender. Modifiable risk factors like IHD, HTN, diabetes, smoking, tobacco and alcohol are associated with LBBB. Echocardiography is useful predictor to evaluate LV dysfunction. By Echocardiographically detected EF%, which shows LV function, clinically correlates with angina & dyspnoea. In patients with LBBB, higher grade of angina and/or NYHA class failure have lower EF and more LV dysfunction.

KEYWORDS:

Echocardiography, angina, LV dysfunction, EF%.

INTRODUCTION:

Left bundle branch block (LBBB) is common disorder associated with increase in cardiovascular mortality [1].

Mortality is increased for LBBB when accompanied by structural heart disease, but it has been also reported that mortality is also high with isolated LBBB. LBBB is also associated with increased mortality in patients with congestive heart failure. Overall LBBB is associated with poor prognosis [1, 2].

LBBB is the result of delay or complete interruption or block of conduction within the left bundle branch block. The delays are associated with a shortening of LV diastole, abnormal septal motion with an associated decrease in regional ejection fraction and an overall reduction in global ejection fraction in the LBBB. In normal individuals LV events either precedes or occur simultaneously with RV events. In patients with LBBB the sequence is reversed [3, 4].

The 12 lead electrocardiogram (ECG) is most readily available non-invasive test for the detection of cardiac disease [7]. ECG criteria for LBBB are 1) QRS duration of > 120 ms 2) Dominant S wave in V1 3) Broad monophasic R wave in lateral leads (I, aVL, V5-V6) 4) Absence of Q waves in lateral leads (I, V5-V6) 5) Prolonged R wave peak time > 60ms in left precordial leads (V5-6) [5].

Echocardiography is one of the most advancing non-invasive techniques in the diagnostic field of cardiology. It is easy in performance, reliability and reproducibility of the results. Left ventricular volumes, and left ventricular ejection fraction, end systolic volume, end diastolic volume, regional wall motion abnormality, dilatation, hypertrophy, septal perfusion defect and ventricular dyssynchrony are considered important prognostic indicator in large number of cardiac disease [3, 4].

Today, the utility of the ECG has been overshadowed by the easy ability of echocardiography. However, several studies have shown that a normal 12 lead ECG is a relatively sensitive and specific marker for normal LV function [5, 7].

Conduction disturbance induce abnormal left ventricular contraction results in left ventricular dysfunction and decrease in left ventricular ejection fraction leading to heart failure and then to death. This study is an attempt to study clinical and echocardiography in patients of LBBB and from results an attempt to find the various causes, severity

and correlation between them.

METHOD:

50 patients who are admitted or attended OPD who has clinical features like chest pain, uneasiness in chest, palpitation, breathlessness are routinely screened by ECG and diagnosed LBBB, were studied further. Every patients is evaluated with asset of format in terms of history, clinical examination, 2d echo. The results are assessed in terms of causes and severity assessed by 2d echo and their correlation. The inclusion criteria included all possible cases of LBBB. Various criteria for LBBB are 1) QRS duration of > 120 ms 2) Dominant S wave in V1 3) Broad monophasic R wave in lateral leads (I, aVL, V5-V6) 4) Absence of Q waves in lateral leads (I, V5-V6) 5) Prolonged R wave peak time > 60ms in left precordial leads (V5-6)

RESULTS:

TABLE 1 : AGE DISTRIBUTION

AGE (years)	Number of patients	Percentage
30-40	1	2
40-50	5	10
50-60	15	30
60-70	18	36
70-80	8	16
>80	3	6

In present study maximum patients are in 60-70 age group. LBBB is more common in 7th decade (36%) in present study which match with Sreenivas T et al study in which 41.66% were older than 61 years.

TABLE 2 : SEX DISTRIBUTION

Sex	Number of patients	Percentage
Male	27	54
Female	23	46

In present study LBBB is slightly more common in male gender (54%) which match with Sreenivas T et al study, male female ratio of 1.38:1.

TABLE 3 : RISK FACTORS FOR LBBB IN PRESENT STUDY GROUP

	NUMBER OF CASES	PERCENTAGE
MALE	27	54%

HYPERTENSION	31	62%
IHD	34	68%
DM	23	46%
SMOKING	12	24%
ALCOHOL	1	2%
TOBACCO	2	4%

So, in present study more common risk factor for LBBB are 68% are having IHD, 62% patients are having hypertension, 54% male gender, 46% are having DM, 24% are smoker, 2% are alcoholic, and 4% are tobacco chewer.

TABLE 4 : CORRELATIONS BETWEEN LVEF AND ANGINA GRADE

ANGINA GRADE (Number of patients)	EF % (Number of patients)
1(5)	MILD (40-60%) (20)
2(16)	MODERATE(30-40%)(15)
3(21)	SEVERE(20-30%)(10)
4(8)	VERY SEVERE(<20%)(5)

Chi-square applied to this table show result=13.628, and P value is=0.0035, so it is highly significant. Thus lower the ejection fraction higher the grade of angina. So we can assume from angina grade how severe underlying CAD exists. In this study most patients have higher grade of angina (grade 3 = 42%). In patients of LBBB angina is important because it is indicative of correctable cause of LV dysfunction.

TABLE 5 : CORRELATION BETWEEN LVEF% AND NYHA GRADE

NYHA GRADE (Number of patients)	EF % (Number of patients)
1(20)	Mild 40 – 60%(20)
2(21)	Moderate 30 – 40%(15)
3(8)	Severe 20 – 30%(10)
4(1)	Very severe <20%(5)

Chi-square applied to this table show result =12.376 and P value is=0.0062, So it is highly significant. So lower the ejection fraction higher the grade of NYHA. As LV dysfunction is increased there is consequently worsening of dyspnoea. in present study most of patients are in NYHA class 2 – class 3 failure.

TABLE 6 : ASSOCIATION WITH ECHO FINDING

In present study 34% of patients are having MR, 20% are having reduced LV compliance, 18% are having hypo kinetic septum, 10% are having concentric LVH, 2% are having DCM and PAH, 4% are associated with AR. In LBBB patients there was strong correlation with reduced LV compliance and hypo kinetic septum particularly lower part and MR because of conduction delay.

NUMBER	2 D ECHO FINDING	Number Of Patients.
1.	REDUCED LV compliance	10(20%)
2.	Septal hypokinesia	9(18%)
3.	Mitral regurgitation	17(34%)
4.	Aortic regurgitation	4(8%)
5.	Concentric LVH	5(10%)
6.	PAH	1(2%)
7.	LV apical clot	4(8%)
8.	DCM	1(2%)

TABLE 7 : CORRELATION WITH EF% (EJECTION FRACTION)

EF (LV Dysfunction)	No of patients
<20% very severe	5(10%)
20-30% severe	10(20%)
30-40% moderate	15(30%)
40-50% mild	14(28%)
50-60% slightly mild	6(12%)

In this study 50% of patients are having moderate to severe LV dysfunction.

TABLE 8 :

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RELATION OF LBBB WITH LVID d/s

	LVID d/s>53 mm in female	LVID d/s >59 mm in male
No of patients	10	9
Percentage	20%	18%

In this study 38% of patients having increased internal diameter of LV. 20% of female having LVID d/s >53mm (normal value 39-53mm) & 18% of male having LVID d/s >59mm (normal value 42-59mm).

DISCUSSION:

In present study, maximum patients are in 50-70 years age group, with 36% in 7th decade & 30% in 6th decade, which match with Sreenivas et al study in which 41.66% were older than 61 years [1].

LBBB is slightly more common in male (54%) compared to female (46%), which match with Sreenivas T et al study, male female ratio of 1.38:1[1].

In present study maximum number of patients of LBBB are associated with Ischemic heart disease(68%) & hypertension(62%). other risk factors in decreasing order are Diabetes Mellitus (46%), smoking (24%), tobacco(4%), alcohol consumption. Similar results were Sreenivas T et al study, in which maximum number of cases of LBBB was associated with IHD (46%) and hypertension (26%) [1]. So HTN, DM, smoking are strongly causative factor of LBBB. So by stopping tobacco, alcohol and modification of life style we can at some extent reduce the incidence of HTN, DM, IHD and ultimately heart failure.

Echocardiographic finding in present study 34% of patients are having Mitral Regurgitation, 20% are having reduced LV compliance, 18% are having hypo kinetic septum, 10% are having concentric LVH, 2% are having DCM and PAH, 4% are associated with AR. In LBBB patients there is strong correlation with reduced LV compliance and hypo kinetic septum particularly lower part and MR because of conduction delay. Compared to bharath M S et al study, LVH was the commonest finding followed by global hypokinesia and regional wall motion abnormality [9].

50% of patients of LBBB in this study group are associated with left ventricular ejection fraction <40% i.e. having moderate to severe Left ventricular dysfunction which is compared to Brunekreef et al study group, who finds that patients with left bundle branch block display higher end-systolic and end-diastolic volumes, a lower ejection fraction and a higher SDI expressing a higher degree of ventricular dyssynchrony as compared to normal ECG [10].

In this study 50% of patients are having moderate to severe LV dysfunction (EF < 40%). As EF% decrease dyspnoea increase so NYHA grade. in this study most patients are in NYHA class 2 – class 3 failure.

LBBB is often hallmark of advanced hypertensive or ischemic heart disease and associated with increased risk of cardiovascular mortality. We can assume from angina grade how severe underlying CAD exists & higher the grade of angina more lower the EF% and more LV dysfunction exist. In this study most patients have higher grade of angina (grade 3 = 42%).

In this study 38% of patients having increased internal diameter of LV. 20% of female having LVID d/s >53mm (normal value 39-53mm) & 18% of male having LVID d/s >59mm (normal value 42-59mm).

CONCLUSION:

From this study we conclude that LBBB is common in old age & male gender. Modifiable risk factors like ischemic heart disease, Hypertension, Diabetes mellitus, smoking, tobacco, alcohol are associated with LBBB. Echocardiography is useful predictor to evaluate LV dysfunction by calculating EF, LVID d/s, associated MR, septal hypokinesia & plan for treatment and ultimately prognosis. By Echocardiographically detected EF%, which shows LV function, clinically correlates with angina & dyspnoea. In patients with LBBB, higher grade of angina and/or NYHA class failure have lower EF and more LV dysfunction. BY comparing so we can assume that decrement of EF% is associated with worsening of angina & dyspnoea.

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