Original Article

ASSOCIATION OF THE IN-HOSPITAL OUTCOME WITH PREDICTORS IN ACUTE CORONARY SYNDROME PATIENTS WITH NEW ONSET LEFT BUNDLE BRANCH BLOCK (LBBB)

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OBJECTIVE:To determine the association of the in-hospital mortality with predictors in acute coronary syndrome patients with new onset left bundle branch block (LBBB).

MATERIAL AND METHODS: This descriptive cases series of 84 patients of acute coronary syndrome with LBBB were selected from emergency and indoor departments of Punjab Institute of cardiology from 09-12-2014 to 08-06-2015 (six months). After written and informed consent patients fulfilling the inclusion and exclusion criteria were included. Patients with ACS having LBBB at the time of admission presenting within 12 hours of onset of chest pain with age range 30-75 years were included while patients with normal left ventricular ejection fraction (EF >50%) were assessed by echocardiography at the time of inclusion. Patients with history of pacemaker implantation, previous history of ACS and previous LBBB (on previous ECG) were excluded from study. Patients were followed till discharge from hospital or death.

RESULTS:Out of 84 patients 51(60.71%) were male while 33 (39.29%) were female. The mean age of the patients was 50.38 years with standard deviation 9.36 although the minimum age was 30 years and maximum age was 69 years. The mean height in LBBB patients was 160.6cm ± 6.39, mean weight 67.43kgs± 6.88, the mean BMI was 28.67kg/m^2 ± 5.45. As regard to risk factors, diabetes mellitus was found in 23(27.38%) patients, hypertension was found in 32 (38.10%) patients and dyslipidemia was found in 32(38.10%) patients, family history of IHD was found in 11(13.10%) patients. The trend towards mortality was found to be 12(14.29%) in LBBB patients with acute coronary syndrome. Out of 51 male patients, death occurred in 12 (23.9%) patients while there was no mortality in 33 female patients. P value 0.003. Out of total 27 patients in age group 30-45, in hospital mortality occurred in 12 (44.4%) patients and 15 (55.5%) patients were discharged. All patients in age group 46-50 and 51-70 survived with 0% in hospital mortality. P value 0.000.Out of total 32 hypertensive patients, in hospital mortality occurred in 12 (37.5%) patients. All 52 (100%) non hypertensive patients were discharged with 0% in hospital mortality. P value 0.000.Out of total 23 diabetic patients, in hospital mortality occurred in 12 (52.1%) patients. All 61 (100%) non diabetic patients were discharged with 0% in hospital mortality. P value 0.000. Out of total 32 patients having dyslipidemia, in hospital mortality occurred in 12 (37.5%) patients. All of 52 patients with normal lipid profile survived with 0% in-hospital mortality. P value 0.000.Out of total 48 non obese patients, in hospital mortality occurred in 4 (8.3%) patients and 44 (91.6%) were discharged. Out of total 36 obese patients, in hospital mortality occurred in 8 (22.2%). P value 0.072.Out of total 11 patients with history of IHD, in hospital mortality occurred in 11 (100%). Out of total 73 patients without history of IHD, in hospital mortality occurred in 1 (1.3%) patient and 72 (98.6%) patients were discharged. P value 0.000

CONCLUSION:Frequency of in-hospital mortality is higher in acute coronary syndrome patients with New Left Bundle Branch Block (LBBB).

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INTRODUCTION:

Acute coronary syndrome is a term used for any condition brought on by sudden, reduced blood flow to the heart. Acute coronary syndrome depends on the specific characteristics of each element of the triad of clinical presentation (including a history of coronary artery disease). The prevalence of the ACS ranged from 7.8% to 32.2%.[1]

LBBB most often occurs in patients having acute coronary syndrome and may be associated with the higher mortality rate and worse overall outcomes than patients without LBBB (63% vs 42%). Individu-

als with LBBB represent approximately 2-11.8% of all patients of suspected ACS.[2]

Left bundle branch block (LBBB) is a cardiac conduction when activation of the left ventricle is delayed. Left ventricle is composed of fibers of the bundle of His that become the main left bundle branch and then divide into anterior and posterior fascicles. Left bundle branch is a large and diffuse structure that typically requires a large insult to lead to acute injury.When a new LBBB is caused by acute myocardial infarction, the site of infarction is usually anterior or anteroseptal, with the infarction involving a large myocardial territory. The left bundle branch comprises the main left bundle and distal anterior and posterior fascicles. Inferior or posterior infarctions may result in a new LBBB from involvement of the more proximal portion of the conduction system supplied by the atrioventricular nodal artery. LBBB can occur de novo in ACS and may be the result of an aging and/or fibrotic conduction system.[3]

Left bundle branch block (LBBB) is associated with a poorer prognosis in comparison to normal intraventricular conduction, but also in comparison to right bundle branch block which is generally considered to be benign in the absence of an underlying cardiac disorder like congenital heart disease[4].The conduction abnormality caused by LBBB alters the ventricular activation sequence, resulting in distortion of the QRS complex, also secondary changes in the ST segment and T wave on the ECG. Presence of LBBB is known to mask the ECG features of CAD[5]. Approximately 50% of LBBB patients have underlying CAD.[6]

Since no data is available in Pakistan as no study has been done on this topic and studies done internationally[2] show varying degree of mortality in ACS with LBBB ranging from 2% to 21%. South Asian countries including Pakistan share the highest burden of cardio-vascular diseases worldwide and it is regarded as the leading cause of death. The mortality and morbidity rates with LBBB in developing countries may vary from the ones mentioned in international literature as there are differences in terms of healthcare facilities and patients' access to these facilities. This study was conducted to find frequency of in-hospital mortality in coronary artery disease patients with new left bundle branch block (LBBB) in a tertiary care hospital Pakistan to know the exact rates of mortality and morbidity in these patients.

MATERIAL & METHODS:

84 patients of acute coronary syndrome with LBBB were selected from emergency and indoor departments of Punjab Institute of cardiology from 09-12-2014 to 08-06-2015. After written and informed consent patients fulfilling the inclusion and exclusion criteria were included. Patients with ACS having LBBB at the time of admission presenting within 12 hours of onset of pain with age range 30-75 years were included. Patients with normal left ventricular ejection fraction (EF >50%) were assessed by echocardiography at the time of inclusion. Patients with pacemaker, previous history of ACS and previous LBBB (on ECG) were excluded from study. Patients were followed through till discharge from hospital or death.

84 cases were calculated with 95% confidence interval, 9% margin of error, and taking expected percentages (21%) of mortality in acute coronary syndrome patients with left bundle branch block (LBBB). Patient's personal and demographic data such as name, age, gender and address was recorded. A standard treatment was given to the patients during emergency stay including (aspirin, clopidogrel, statin, heparin and nitrates). CKMB and Tropnin-T test were performed during emergency stay. Predictors like hypertension, diabetes, hyperlipidemia, family history of IHD and smoking were recorded after admission.

Patients were followed through till discharge from hospital or mortality. All data entered on pre-designed performa. Statistical analysis was performed with SPSS Version 20.0. Continuous variables like age were reported as mean±SD. Categorical variables like sex and mortality were reported as frequencies and percentages.

Chi-square was used to analyze the association of the qualitative variables i.e. (age, gender, Hypertension, Diabetes Mellitus, Body mass index, dyslipidemia and family history of ischemic heart disease) within-hospital mortality while for quantitative variables independent sample t test was applied. P. value ≤0.05 was considered significant.

RESULTS:

Out of 84 patients 51(60.71%) were male while 33 (39.29%) were female. The mean age of the patient was 50.38 years with standard deviation 9.36 although the minimum age of 30 years and maximum age was 69 years.

The mean height was160.6cm ± 6.39, mean weight was 67.43kgs± 6.88, the mean BMI was28.67kg/m^2 ± 5.45.

Hypertension was found in 32(38.10%) patients while 52(61.90%) were non hypertensive. As regard to risk factors, diabetes mellitus was

found in 23(27.38%), dyslipidemia was found in 32(38.10%) patients, family history of IHD was found in 11(13.10%) patients. The trend towards mortality was found to be 12(14.29%) in LBBB patients with acute coronary syndrome (table 1).

Out of 51 male patients, mortality occurred in 12 (23.9%) patients. Total 33 female patients were treated with no mortality. P value 0.003.

Out of total 27 patients in age group 30-45, in hospital mortality occurred in 12 (44.4%) patients and 15 (55.5%) patients survived. All 11(100%) patients in age group 46-50 were discharged with 0% in hospital mortality. All 46 (100%) patients in age group 51-70 were discharged with 0% in hospital mortality. P value 0.000.

Out of total 32 hypertensive patients, in hospital mortality occurred in 12 (37.5%) patients. All 52 (100%) non hypertensive patients were discharged with 0% in hospital mortality. P value 0.000. Out of total 23 diabetic patients, in hospital mortality occurred in 12 (52.1%) patients. All 61 (100%) non diabetic patients were discharged with 0% in hospital mortality. P value 0.000. Out of total 32 patients having dyslipidemia, in hospital mortality occurred in 12 (37.5%) patients.

Out of total 48 non obese patients, in hospital mortality occurred in 4 (8.3%) patients. Out of total 36 obese patients, in hospital mortality occurred in 8 (22.2%) patients. P value 0.072.Out of total 11 patients with history of IHD, in hospital mortality occurred in 11 (100%). Out of total 73 patients without history of IHD, in hospital mortality occurred in 1 (1.3%) patient (Table-2).

Table-1: Patient characteristics of acute coronary syndrome patients with new onset left bundle ranch block (LBBB)

Variables	Frequency(%)
Male	51(60.71%)
Female	33 (39.29%)
Age	50.38±9.36(30-69)
Height	160.6cm ± 6.39
Weight	67.43kgs± 6.88
BMI	28.67kg/m^2 ± 5.45
Hypertension	32(38.10%)
diabetes mellitus	23(27.38%)
Dyslipidemia	32(38.10%)
family history of IHD	11(13.10%)
Mortality	12(14.29%)

Table-2: Association of the in-hospital outcome with predictors in acute coronary syndrome patients with New Left Bundle Branch Block (LBBB).

Variables		Mortality		P-value
		Yes	No	
Gender	Male	12 (23.9%)	39 (76.5%)	0.003
	Female	0 (0%)	33 (100%)	
30-45		12 (44.4%)	15 (55.5%)	0.001
46-50		0(0%)	11 (100%)	
51-70		0(0%)	46 (100%)	
Obese		8(22.2%)	28(77.7%)	0.072
Hypertension		12 (37.5%)	20 (62.5%)	0.001
Diabetes		12 (52.1%)	11 (47.8%)	0.001
Dyslipidemia		12 (37.5%)	20(62.5%)	0.001
Family History of IHD		11 (100%)	0 (0%)	0.001

DISCUSSION:

Our results showed that frequency of LBBB was higher in male patients with ACS indicating that men are at increased risk of LBBB (60.71%). Kassaian[7] et al established that LBBB is more prevalent in male patients (64.5%). Huvelle[8] et al found that men are at increased risk of LBBB as (62%). Our results are similar to these two studies.

Another study by Tabrizi[9] et al established that diabetes is more prevalent in female patients compared to non-diabetic patients (58%). Present study demonstrated similar results. Chang[10] et al found new LBBB is more common in female due to selection bias of the sample data Chang showed dissimilar results.

Present results showed that mean age of the patients in LBBB was elder as (59. 31±9.98). Chang[10] et al (2009) found mean age of the patients was in LBBB group as (54.3 ± 15 years), Huvelle et al (2010)[8], Kontos[11] et al, (2001) and Tabrizi[9] et al (2007) scrutinized that in LBBB mean age of the patients was elder as (74.7±9.98). Present study showed dissimilar results due to the small sample size.

Present study reported that mortality rate (14.29%) was higher in patients with LBBB. Kontos [11] et al reported 11% mortality rate in LBBB in acute MI patients. Kansara[12] et al found higher mortality rate (14.2%) in new onset LBBB with ACS patients. Another study by Kassaian[7] et al scrutinized that mortality was found to be higher (8.5%) in LBBB with ACS. Present results showed similar results.

Further study by Rose[1] et al examined that patients with LBBB had lower in-hospital mortality (4.3%). Tabrizi[9] et al examined that in-hospital mortality was found to be (7.6%) in patient having LBBB. These studies showed dissimilar results as compared to our study.

According to Wong[13] et al, and Neeland[3] et al patients with new or presumed new LBBB had greater 30-day mortality (16%). Hesse[14] et al established that mortality was greater in patients with complete left bundle branch block 36/150 (24%). This study showed high mortality rate due to associated co-morbid conditions.

Future studies are needed in patients with ACS to investigate further the influence of LBBB for mortality in order to improve the prognosis.

CONCLUSION:

Through this study it was concluded that frequency of in-hospital mortality is higher in acute coronary syndrome patients with new onset left bundle branch block (LBBB), so these patients need more intensive care to decrease in-hospital mortality.

Author's Contribution

OA: Conducted study, wrote the article.
NHM was consultant incharge of the audit and gave frequent advice, corrections and did the proof reading
BA: Helped in study and reviewed the article.
MUF: Re-arranged data and corrected article.
SA: Tables.
AA: Figures

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