

# Study of prognostic significance of bundle branch blocks in acute coronary syndrome

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## Abstract

**Background:** Recent studies based on epidemiology, have shown a strong association between bundle branch block (BBB) and cardiovascular disease, more specifically hypertension, cardiomegaly, coronary artery disease, and heart failure. **Objectives:** To see any prognostic significance of bundle branch blocks in coronary artery syndrome. **Material and Methods:** This was retrospective analytical study carried out at Medicine Department of a tertiary care hospital on 100 cases with acute coronary syndrome. Divided into 2 groups of 50 in cases with no BBB and those with BBB. Standard protocol was followed for definitions and treatment. Analysis was done using SPSS vr20. Results: Out of 100 males were in majority with 65%. Right bundle branch block was the most common block (58%). Overall HT was the most common cardiovascular risk factor seen in this study, next was DM. There was statistical association between type of block and location of AMI. Most frequent MI location was anterior wall. Better ejection and lesser CPK value were seen in those with no BBB, worse was seen cases with RBBB. Most deaths were seen in group with RBBB (57%). **Conclusions:** RBBB was the major cause of post AMI mortality in this study. **Key Words:** Cardiovascular diseases, Bundle branch block, RBBB, LBBB

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## INTRODUCTION

With the turn of the century, heart diseases have become the most common cause of mortality in India.<sup>1</sup> When compared with the people of European countries, CVD affects Indians at least a decade earlier and in their most productive years of life.<sup>2,3</sup> For example, in Western populations only 23% of CVD deaths occur before the age of 70 years; in India, this number is 52%.<sup>4</sup> In addition, case fatality attributable to CVD in low-income countries, including India, appears to be much higher than in middle- and high-income countries.<sup>5,6</sup> The World Health Organization (WHO) has calculable that, with the

current burden of CVD, India would lose \$237 billion from the loss of productivity and spending on health care over a 10-year period (2005–2015).<sup>7</sup> The burgeoning burden of CHD in Asian country are often explained by the dire rise within the prevalence of coronary risk factors like polygenic disorder, cardiovascular disease, atherogenic dyslipidemia, smoking, central fleshiness and physical inactivity. Rapid urbanization and change in lifestyle that occurred during the past two decades have led to the growing burden of coronary risk factors in India.<sup>8</sup> Presence of complete Bundle Branch Block (BBB) Left or Right in AMI patients represents association and really vital predictor of in-hospital complication and poor survival on long run. Presence of recent onset bundle branch block is related to raised mortality in patients with acute coronary syndrome (ACS). Development of recent bundle branch block despite prompt fibrinolytic medical care might signify an intensive and in progress AMI. It's related to overall poor prognosis, and high risk for brief term mortality.<sup>9</sup> In this regards we have undertaken this study to see the prognostic significance of BBB in cases presented with coronary artery syndrome in our hospital.

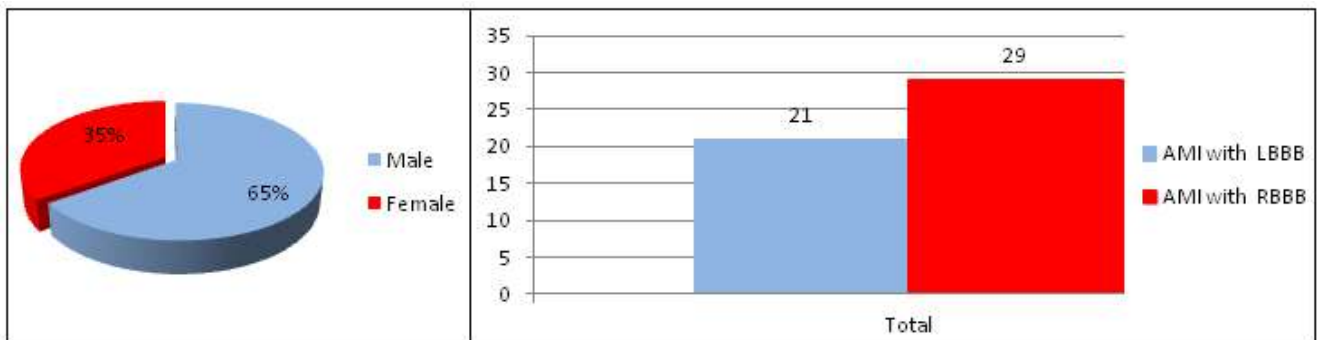
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## MATERIAL AND METHODS

This was a retrospective observational study done from reviewing records of 50 patients with AMI and bundle branch block and 50 cases without any bundle branch block admitted in ICU of DR.SCGMC NANDED , MAHARASHTRA between January 2019 to September 2019. All those with incomplete, intermittent or alternating BBB on the admission ECG were excluded from the study. Standard definition: LBBB: 1. QRS duration > 120 ms in the presence of normal sinus or supraventricular rhythm; 2. QS or RS complex in lead V1; 3. broad or notched R waves in leads V5 and V6, or an RS pattern, and 4. R peak time  $\geq 0.006$  s without Q waves in lead I, V5 or V6.10 Standard definition: RBBB:

1. QRS duration > 120ms in the presence of normal sinus or supraventricular rhythm; 2. R or RSR' complex in lead V1, and 3.RS in leads I, aVL, V5, V6, with a prolonged, shallow S wave.10 . Institutional ethical committee approval obtained . Preliminary history with detail questioning regarding the time of onset of chest pain, time of admission, detailed clinical status on admission were recorded from IPD papers. Serial ECGs attached in IPD papers were studied to record the AMI location .Statistical analysis was based on the Student t-test for continuous variables and the chi-square test for proportions. p values < 0,001 were considered statistically significant.

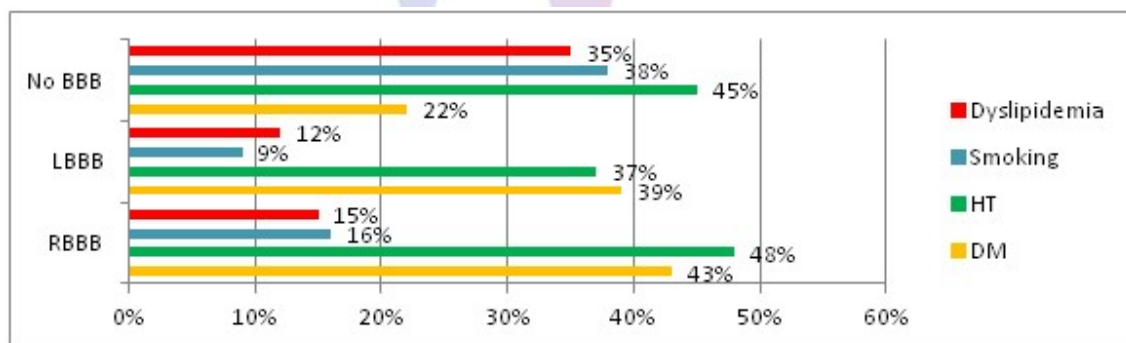
## RESULTS



**Figure 1:** Percentage distribution of study subjects **Figure 2:** Distribution of cases as per type of bundle branch block

Figure 1, In this study male were in majority with 65% of the study, females formed 35%.

Figure 2, The right bundle branch block was the most common block (58%) seen in this study.



**Figure 3:** Percentage distribution as per cardiovascular risk factors in study groups (madras)

(p value - 0.58) risk factors were not associated significantly in two groups. Overall HT was the most common cardiovascular risk factor seen in this study, next was DM.

**Table 1:** Distribution as per AMI location in study groups (both)

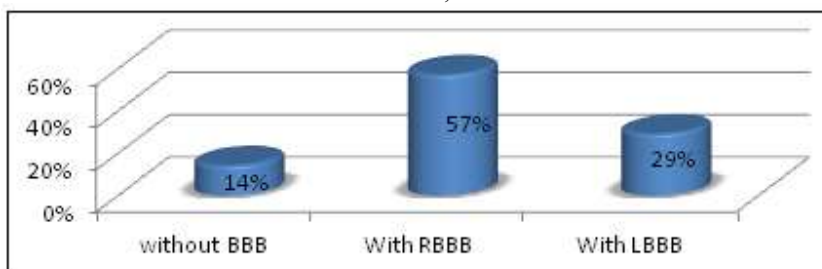
Location	Study groups			p value
	No BBB	RBBB	LBBB	
Inferior	30%	20%	19%	0.01
Anterior/ Septal	42%	47%	42%	0.01
Others	28%	33%	39%	0.01

There was statistical association between type of block and location of AMI. Of cases with BBB, the most frequent MI location was anterior wall; this association was particularly strong for patients with RBBB.

**Table 2:** Distribution as per ejection fraction and CKP values in cases

Variable	Study groups			p value
	NO BBB	RBBB	LBBB	
Ejection fraction %	52 (41-60)	40 (34-58)	45 (32-52)	0.01
CPK value(I/U)	1651 (450-2480)	3890 (1850-5200)	3492 (2200-5540)	0.01

There was statistically significant association between study groups and their CPK and ejection fraction values. Better ejection and lesser CPK value were seen in those with no BBB, second worse values were seen with RBBB.



**Figure 4:** Percentage distribution as per mortality

Among total 18 deaths, most deaths were seen in group with RBBB (57%), least were seen in those without BBB (14%), this difference was found to be statistically significant.

**DISCUSSION**

This retrospective study was carried out on 100 cases of AMI divided into those with no BBB and those with BBB. The mean age of study was found to be 65.2±21 years, with age ranged from 42-85, similar age range and mean age was seen in a study done by Shankar H.<sup>11</sup> In this study male were in majority with 65% of the study, females formed 35%. Freedman RA *et al*<sup>12</sup> study found 85% cases as males and remaining 15% females in their study. In this study RBBB was seen as most common (58%) block among study groups while LBBB was seen in 34% cases. This finding was in accordance with Shankar H<sup>11</sup> in which the RBBB was seen in 62% cases, and LBBB in 38% cases. This finding was also supported by study Daniela T<sup>13</sup> in which they have found RBBB in majority of the subjects. In this study any of the risk factors were not associated significantly in any groups. Overall HT was the most common cardiovascular risk factor seen in this study, next was DM with p value of (0.58). Similar was seen with Daniela T<sup>13</sup> study. In this study most frequent MI location was anterior wall similar was seen with Daniela T<sup>13</sup> study. In a study by Wong CK *et al*<sup>14</sup> who observed the prognostic differences between various bundle branch block during the early stage of acute myocardial infarction, emphasized on the insights from the Hirulog and Early Reperfusion or Occlusion (HERO)- 2 trial, said there disarranged cardiac findings in cases with BBB than those without any BBB. Similar was seen with our study as we found significantly lower CPK levels and good ejection fraction when compared to RBBB and LBBB cases. Melgarejo-Moreno

A *et al*<sup>15</sup> and Vivas D *et al*<sup>16</sup> study observed more deranged CPK values and EF in RBBB cases than LBBB cases. This was in accordance with our study. In this study those AMI cases with RBBB were found to have highest mortality rate with 57%. Similar observations were noted by a meta-analysis done by Xiang L *et al*<sup>17</sup> which said RBBB was associated with an increased risk of all-cause mortality and indicates a poorer prognosis in patients with AMI. Guerrero M *et al*<sup>18</sup> reported that in the presence of RBBB, patients with AMI developed more co-morbidities and had a higher mortality risk. While dissimilar observation were done by Topol EJ *et al*<sup>19</sup> who found most mortality of 56% in LBBB group. While in Daniela T<sup>13</sup> study the mortality with LBBB was 29%. Both of these studies supported our findings.

**CONCLUSION**

From the observation of this study we can say that AMI was more common in males with RBBB being responsible for majority of post AMI deaths. While cases with no BBB were having significantly better prognosis than all BBB groups. We have done this study on smaller sample, we suggest larger case control study so as to rule out confounding factors if any.

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