

## **Observational Study of Conduction Blocks After Acute Myocardial Infarction Admitted at Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar.**

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### **Abstract**

Acute Myocardial infarction (AMI) is one of the most fatal diseases of human community. Its incidence is almost 2-3 times more in Indian ethnicity. Myocardial infarction leads to complications like mechanical and electrical abnormalities. Conduction blocks are seen in myocardial infarction, more commonly in Inferior-posterior wall infarction because of proximity of conduction system.

**Aim:** This study is undertaken to evaluate various patterns of conduction blocks occurring in Acute myocardial infarction. It also correlates risk factors like diabetes mellitus and site of infarction.

**Material and methods:** 100 cases of Acute myocardial infarction (AMI) admitted in semi urban hospital Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar were included in this observational study.

**Results:** Among 100 patients, 31 patients (31%) developed conduction blocks. Among the 100 patients, 6 patients (6%) developed first-degree AV block. 3 patients (3%) developed second – degree AV block. 3 patients (3%) developed third-degree AV block. 8 patients (8%) developed left anterior hemiblock (LAHB). 10 patients (10%) developed RBBB and 8 had complete RBBB and 2 had incomplete RBBB. This was the most common conduction block in the present study. 1patient (1%) developed LBBB and all had complete LBBB. **Conclusion:** Myocardial infarction is common in the age group of 50-69 years. 31% of patients with MI developed conduction blocks. Diabetes and hypertension as combined risk factors develop more conduction block complications. Complete heart block is seen more in diabetics and hypertensives. LV dysfunction after recovery from MI is noted in DM + HTN group. Mortality is more in patients with conduction blocks when compared to patients without conduction blocks (P = 0.0293).

**Key words:** AMI, Diabetes, Hypertension, RBBB, LBBB, Complete heart block

## Introduction

Acute Myocardial infarction is one of the most fatal disease of human community<sup>12,13</sup>. Its incidence is almost 2-3 times more in Indian ethnicity. Diabetes mellitus is the most important risk factor of MI<sup>11</sup>. 7-10% of general population are reported to be diabetics in south India. Another abnormal risk factor in India is specified lipid profile where HDL is low and triglycerides and LDL is relatively high. More over these people are having average Body Mass Index (BMI). It is alarming to note childhood obesity is increasingly observed in India. Incidence of myocardial Infarction is seen 10 years before when compared to western population. Myocardial infarction will produce many complications like mechanical and electrical abnormalities. Conduction blocks are seen in myocardial infarction especially more common in Inferior-posterior wall infarction because of proximity of conduction system. Complete heart block is one of the major complications after MI leading to high mortality<sup>2</sup>. Hence this study was undertaken to compare site of infarction and number of vessels involved. It also correlated with risk factors like diabetes mellitus.

## Materials and Methods

100 cases of Acute myocardial infarction admitted in semi urban hospital Chalmeda Anand Rao institute of medical sciences, Karimnagar during November 2018 to October 2020 were included in this observational study. Patients having acute myocardial infarction as per W.H.O. criteria are included in the study<sup>12</sup>. History of ischemic type of chest discomfort, evolutionary changes on serially obtained electrocardiography, 2D echo, Angiogram (CAG) were done to find site of infarction and conduction blocks. Patients with old bundle branch block, cardiomyopathy, previous history of blocks, congenital or rheumatic heart disease and patients using drugs causing conduction blocks like clonidine, methyl dopa, verapamil, digoxin etc. Their door to needle time was recorded. For all the cases biochemical investigations like blood sugar, serum creatinine and lipid profile, Trop – T was estimated. Regular ECG monitoring and 2D echocardiography was carried out for LV function. At appropriate time coronary angiography was performed for suitable cases 1-2 stents were implanted, rest of the cases had medical management. All the cases reached to hospital within 24hrs thrombolysis with Tenecteplase was given<sup>7</sup>. Type of conduction blocks recorded, those who were having complete heart block treated with temporary pacemaker. Patients hospital stay was recorded. At the time of discharge LV function was recorded along with various conduction blocks. LV dysfunction with conduction blocks was compared with patients without conduction blocks. Informed consent and ethics approval have been taken for the study. Continuous variables are presented as mean + SD and frequency variables as percentages. Chi –square and Fisher’s exact test were performed for statistical significance. P value of <0.05 was considered for statistical significance

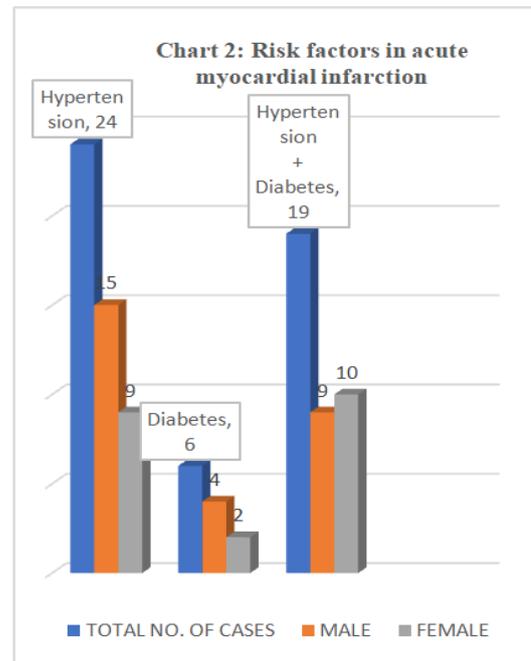
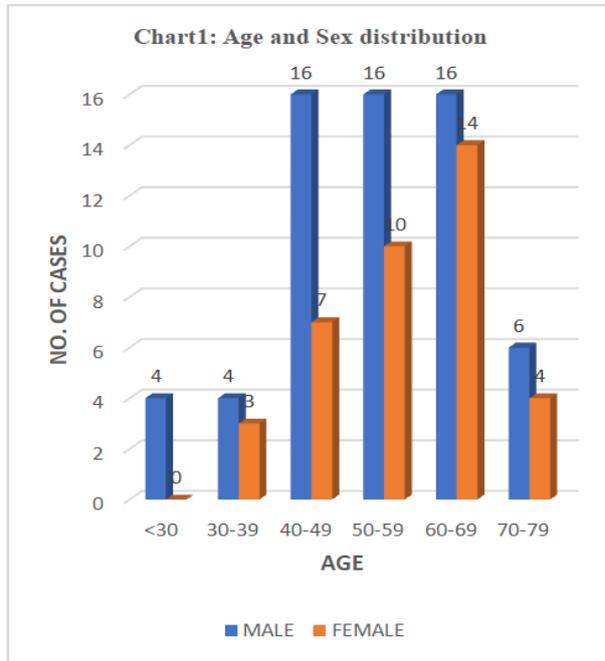
## Results

100 cases of Acute myocardial infarction were undertaken for study. Their age group is from 26 to 79 years<sup>4</sup>, both males and females were included. More than 50% of cases are between the age group of 50-69, Male group is predominant. 25% people are having diabetes out of these 19 were having both diabetes and hypertension. Peculiarly hypertension is noted as major risk factor in our group (43%).

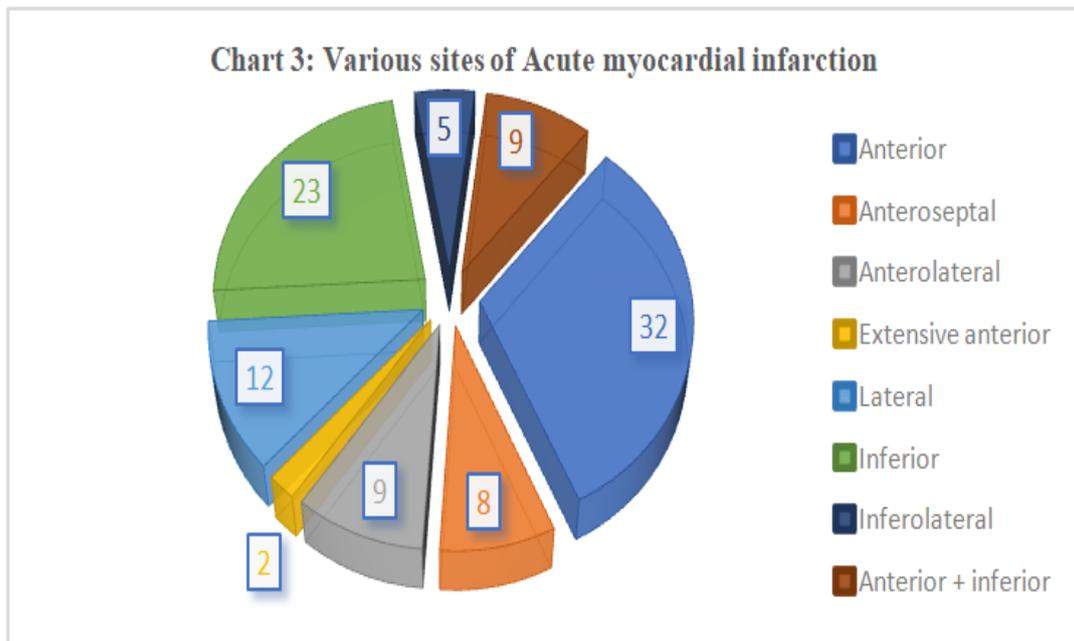
**Table 1: Age and sex distribution:**

Age in years	Sex		Total	Percentage
	Male	Female		
<30	4	0	4	4
30-39	4	3	7	7

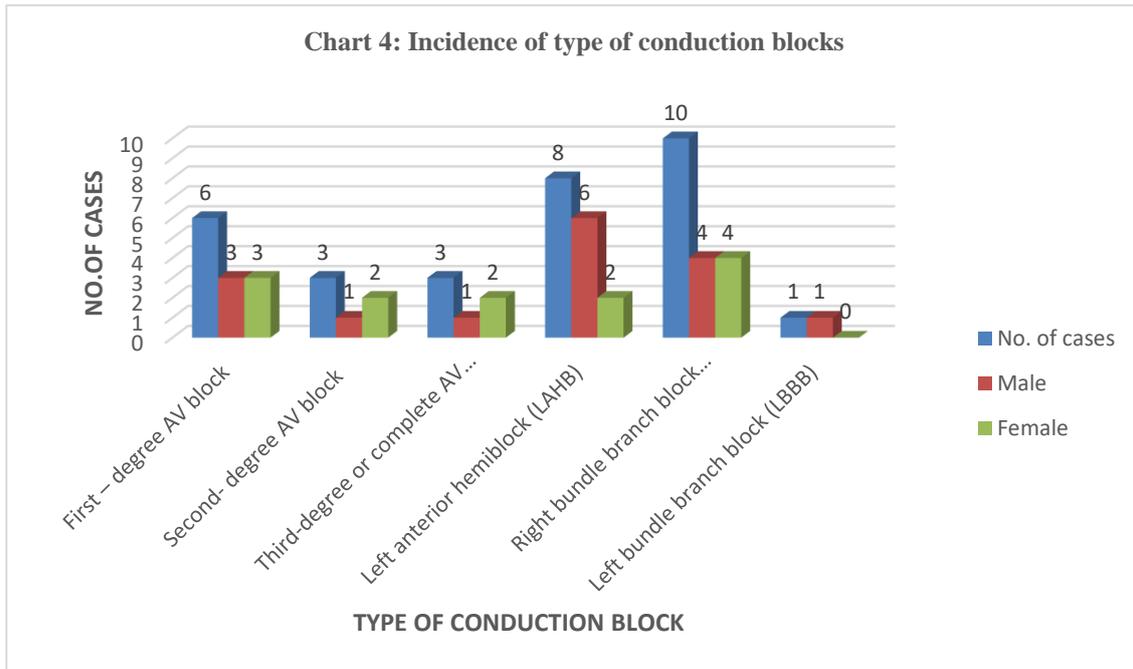
40-49	16	7	23	23
50-59	16	10	26	26
60-69	16	14	30	30
70-79	6	4	10	10
Total	62	38	100	100



In our study group majority of patients had anterior wall infarction 51% followed by posterior inferior wall infarction 28%.



In the present study among 100 patients presenting with AMI, 31 patients (31%) developed conduction blocks. Among the 100 patients, 6 patients (6%) developed first-degree AV block. 3 patients (3%) developed second – degree AV block. 3 patients (3%) developed



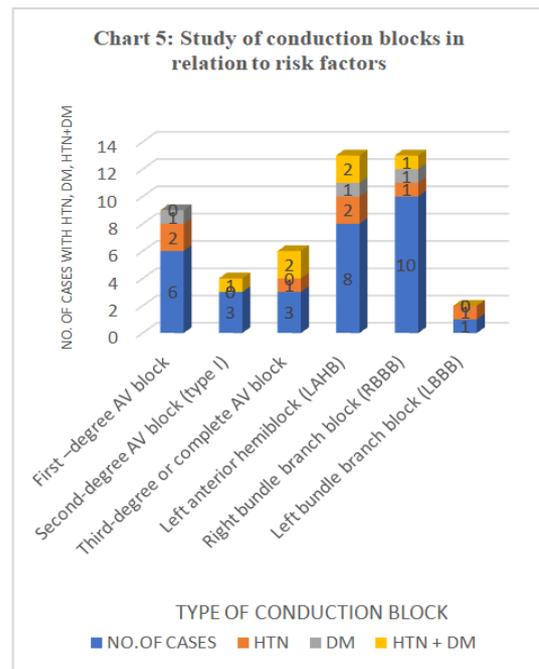
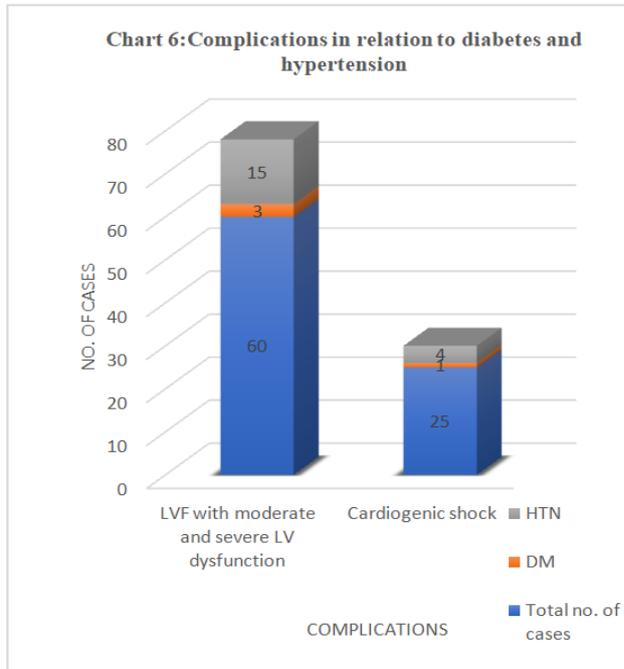
third-degree AV block. 8 patients (8%) developed left anterior hemiblock (LAHB). 10 patients (10%) developed RBBB of them 2 cases were having incomplete RBBB. 1 patient (1%) developed LBBB. Among 31 conduction blocks, 16 were male and 13 were females with male to female ratio 1.23. Majority of the cases showing RBBB and LAHB (18 patients 58.06%) may not be due to fresh myocardial infarction<sup>9,10</sup>.

#### **Study of conduction blocks in relation to risk factors:**

Complete heart block is noted in diabetes and hypertension combination group (66.66%). One case was kept on temporary pacemaker.

Out of 60 cases having moderate to severe LV dysfunction after AMI 32 cases are hypertensives and diabetes.

On correlating site of infarction with conduction blocks maximum cases 20 (64.51%) are anterior and inferior wall infarction is 11 (35.48%). Out of 3 cases of complete heart block 2 were showing extensive anterior wall infarction. This information showing that involvement of conduction system in anterior wall infarction shows area of infarction is extensive.



**Table 2: Co-relation of mortality in type of conduction block**

Group	Total No. of cases	No. of deaths	Percentage
First-degree AV block	6	1	16.66
Second-degree AV block (type I)	3	1	33.33
Third-degree or complete AV block	3	1	33.33
Left anterior hemiblock (LAHB)	8	1	12.5
Right bundle branch block (RBBB)	10	3	33.33
Left bundle branch block (LBBB)	1	1	100
Total patients with conduction blocks	31	8	25.80
No blocks	69	5	7.24
Total	100	13	13

Among 31 patients with conduction blocks, 8 patients (25.80%) expired. Among 69 patients without conduction blocks, 4 patients (5.79%) expired. **The mortality among patients with conduction blocks is found to be higher than the mortality among patients without conduction blocks, the difference is significant (p=0.0293) statistically when chi-square test was used ( $\chi^2 = 4.7470$ )<sup>4,6,8</sup>.**

**Discussion**

100 cases of Acute myocardial infarction are undertaken for the study. The age limit varied between 26-79. Vide chart 1 and table 1. Maximum cases of myocardial infarction between 50-69 years. This age group is more vulnerable because prolonged exposure to risk factors. This high incidence may be due to maximum number of cases admitted at this group. Below 40 years AMI is unusual. Above the age of 65 years common presentation is stable angina. Maximum cases of acute coronary syndrome occur between the age 40-60 years. On review of sex distribution however males are predominant but postmenopausal age group in females are 73% almost equal to male incidence<sup>8</sup>. (reference table no 1). Literature shows postmenopausal women are equal at the risk of ischemic heart disease on par with males. This study has included only important risk factors like DM and HTN. 43% of cases are hypertensives and 25% are diabetics. 19 patients of AMI are having both diabetes and hypertension (19%). Vide chart2. We reviewed incidence of conduction blocks and LV dysfunction based on these risk factors. 51.6% of patients with conduction blocks and 53% of

patients with moderate to severe LV dysfunction was noted in HTN and DM group<sup>11</sup>. On inspection site of infarction according to ECG 51% people having anteroseptal to extensive anterior wall infarction. 28% of people showed inferior wall infarction. 61.2% of conduction blocks are seen in anterior infarction whereas 32.25% is seen in inferior infarction. Interestingly conduction blocks are more seen in extensive anterior myocardial infarction when compared to inferior group. Unusually conduction system is close to inferior wall and conduction blocks are seen commonly in inferior group, but in our study anterior infarction showing a greater number of conduction blocks. This indicates anterior infarctions are massive to the extent of involvement of conduction system. Chart 4 shows RBBB is the most common conduction block followed by LAHB<sup>4,5,8</sup>. Complete heart block was seen in 3 patients, who are having DM + HTN. One case required temporary pacemaker<sup>2</sup>. It is significant to note that mortality rate in conduction blocks is 25.8% when compared to MI without conduction blocks (7.25%)<sup>3,6,8</sup>. Vide table 2. Conduction blocks in MI shows poor prognosis<sup>1</sup>

### Conclusion

Myocardial infarction is common in the age group 50-69 years<sup>6,8</sup>. 31% of patients with MI developed conduction blocks. RBBB and LAHB are the most common blocks noted. Diabetes and hypertension as combined risk factors develop more conduction block complications. Complete heart block is seen more in diabetes and hypertensives. LV dysfunction after recovery from MI noted in DM + HTN group<sup>11</sup>. Mortality is more noted in conduction blocks when compared to without conduction blocks (P = 0.0293)<sup>3,6,8</sup>.

### Limitations to the study

1. It is small study of 100 cases to draw a definite conclusion.
2. All the patients have not come to the hospital in window period

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