***Original article***

# Epidemiology and Pattern of Fascicular Block Following ST-Elevated Acute Myocardial Infarction

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**Abstract:**

***Aim:*** The aim of the study was to observe the epidemiology and pattern of fascicular block following ST elevated acute myocardial infarction (AMI). ***Background:*** Fascicular block following S-T elevated acute myocardial infarction is often seen in CCU. It predicts poorer in-hospital outcome and signifies underlying extensive myocardial damage with jeopardized conducting system. ***Materials and Method:*** This one year prospective observational study was carried out among the S-T elevated AMI patients in the CCU of NICVD during the period of January 2004 to December 2004. Hundred consecutive patients of first attack of AMI with or without fascicular block were included in this study. The patients suffering from congenital heart disease, cardiomyopathy, valvular heart disease and the patients having permanent pacemaker or preexisting syndrome were excluded from the study. Case selection was done with the help of history, physical examination, twelve leads surface ECG and echocardiography. ***Results:*** The mean age of the studied patients was 54.2±10.0 years. Highest percentage (38%) was in the age group 51-60 years. The mean age of male Patients was 51.0 ±9.9 years. Analysis reveals that the mean age of the female patients was significantly higher than the male patients. Among the studied patients, highest percentage had history of smoking 67% followed by hypertension (39%), diabetes mellitus (39%) etc. Among the studied patients 66% had anterior MI and 34% had inferior MI. Highest percentage of patients presented with isolated RBBB (54.0%), followed by LBBB (18%), bi-fascicular (16.0%), tri-fascicular block (8.0%) and isolated LAHB (4.0%). Among the patients with anterior MI, highest percentage presented with RBBB (42.4%) followed by bi-fascicular block (24.2%), LBBB (15.2%) and LAHB (6%) whereas with inferior MI, 76.5 percentage had RBBB followed by LBBB (23.5%). ***Conclusion:*** In this study majority of the patients were male. Most of the patients were in the age group 50-60 years. Number of anterior MI was higher (66%) than inferior MI (34%). Anterior MI showed highest incidence of fascicular block than inferior MI which is statistically significant. Among the fascicular blocks, RBBB was the highest (54.0%) and next common fascicular block was LBBB, least common was LAHB. Left posterior hemi-block was not found in this study. Statistical variation among the different types of fascicular blocks observed in this study was significant. Smoking was the most important risk factor. So, fascicular blocks following acute MI are more prone to develop complications than acute MI without fascicular block. Message is that patient with fascicular blocks following acute MI needs special care and treatment.

**Keywords:** epidemiology; pattern; fascicular block; ST-elevated AMI

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## Introduction

Coronary artery disease is the commonest heart disease and one of the single most important cause of death in the affluent countries of the world[1]. Incidence of coronary artery disease has been increasing in our country as well. There are various complications of AMI. Fascicular block is one of them. Fascicular block includes right bundle branch block(RBBB),Left bundle branch block(LBBB), Left anterior hemi block(LAHB), Left posterior hemi block(LPHB), Bi-fascicular block(RBBB+LAHB,RBBB+LPHB) and tri-fascicular block(RBBB+LAHB/LPHB+1$^{st}$degree HB). It is recognized that AMI complicated by fascicular block, both mortality and risk of various

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complications are increased. This is presumably a result of large extent of infarction necessary to involve the fascicles[2] Presence of fascicular block in AMI is associated with increased risk of congestive heart failure, high degree of atrio-ventricular block, ventricular fibrillation and higher mortality rate[3] Bi-fascicular and tri-fascicular block in the setting of AMI is more likely to progress to complete heart block and is associated with higher mortatility[4] The development of fascicular block in AMI usually signifies an extensive infract. Many studies have been done in the developed countries and they have clear cut data regarding the epidemiology and pattern of fascicular block in patients of AMI with or without fascicular block. As a result, they are able to identify their high risk patients to deliver their meticulous care to decrease the mortality and morbidity. In our country, there is no such clear cut data regarding epidemiology and pattern of fascicular block in patients of AMI with fascicular block. Considering this view, an assessment was made regarding epidemiology and pattern of fascicular blocks following AMI.

**Materials and Methods**

This prospective case control observational study was carried out among the S-T elevated AMI patients in the CCU of NICVD during the period of January 2004 to December 2004. One hundred consecutive patients of first attack of AMI with or without fascicular block were included in this study. The patients suffering from previous heart disease like congenital heart disease, cardiomyopathies, valvular heart disease and the patients having permanent pacemaker or preexisting syndrome were excluded from the study. Fifty number of patients suffering from newly diagnosed fascicular block with acute AMI was considered as case and equal number of patients without fascicular block was taken as control. Case selection was done with the help of history, physical examination, twelve leads surface ECG and echocardiography. Hospitalized patients were followed up both clinically and with bedside continuous ECG monitoring daily to detect pattern of fascicular block following AMI. Protocol was fully explained to the study patients and informed consent was taken. Clearance from ethical committee of the institution was obtained. All the information's were recoded in a standard case recording form. Data was processed and expressed in frequency, percentage, mean ± standard deviation as applicable.Comparison between two groups were done by unpaired student's t test and chi-square test. Statistical analysis of result was performed by using SPSS (Statistical package for social science). P' value of less than 0.05 was considered as significant.

**Results:** The mean age of the studied patients was 54.2±10.0 years. Highest percentage (38%) was in the age group51-60 years ( Fig-I).

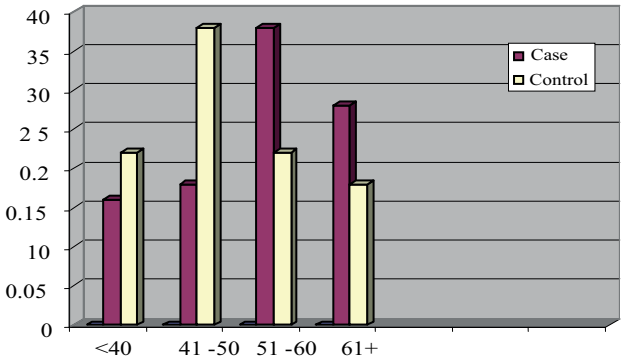



Fig:-1: Age distribution of the study patients

Figure –II demonstrated the mean age of male Patients was 51.0±9.9 years and the mean age of female patients was 58.o±10.4.

Analysis reveals that the mean age of the female patients was significantly higher than the male

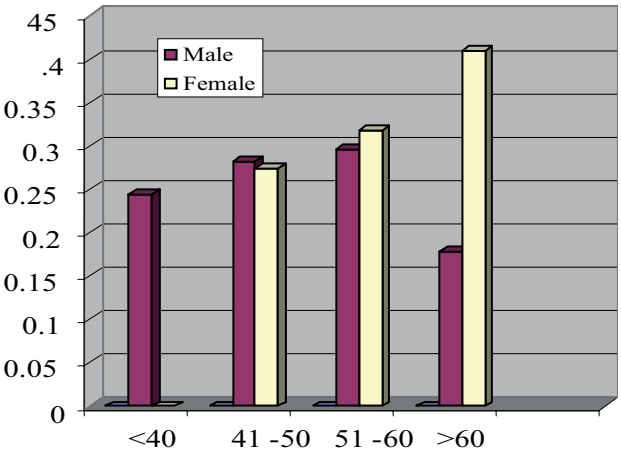
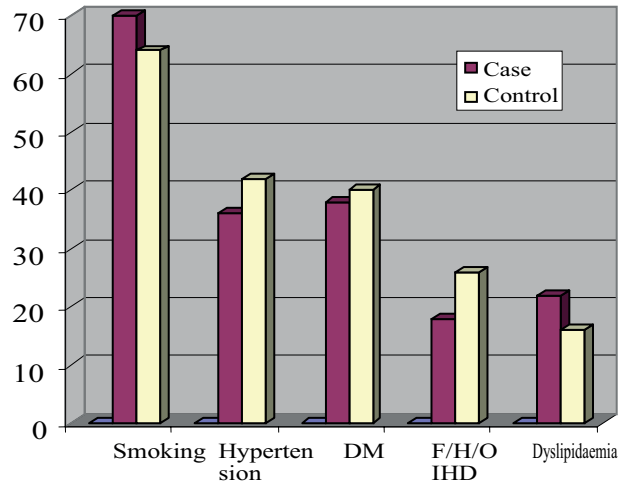



Figure-II: Age and sex distribution of the study patients.

patients and the difference was statistically significant. Among the studied patients, highest percentage had history of smoking 67% followed by hypertension (39%), diabetes mellitus (39%) etc has shown in figure-III.

Among the studied patients 66% had anterior MI and 34% had inferior MI.

Figure-IV has demonstrated that the highest percentage of patients presented with isolated RBBB(54.0%), followed by LBBB(18%), bi-fascicular(16.0%), tri-fascicular block(8.0%) and isolated LAHB(4.0%).Among the patients with anterior MI, highest percentage presented with RBBB(42.4%) followed by bi-fascicular block




FigureIII: Risk factors of study patients.

(24.2%),LBBB(15.2%) and LAHB(6%) where as with inferior MI,76.5 percentage had RBBB followed by LBBB(23.5%) has shown in the figure-V.

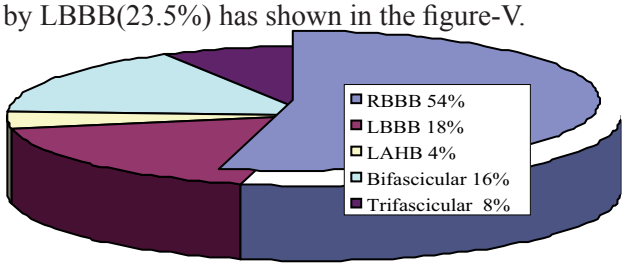



Figure:-IV: Distribution of fascicular block of the cases (n-50).

## Discussion

Fascicular block following AMI is commonly seen in coronary care unit and it is associated with increased risk for short and long term mortality[5] Many studies have been done abroad and all studies showed the increased mortality and morbidity associated with fascicular block following AMI in comparison to AMI without fascicular block .In the context of our country this study was done to asses the epidemiological risk factors and patterns of fascicular block following AMI. The epidemiological risk factors were studied

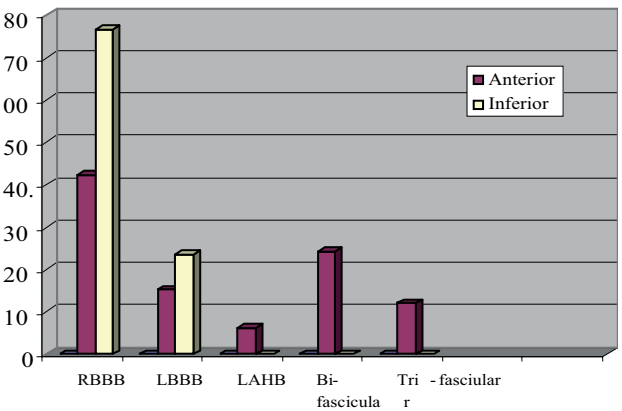



Figure:-V: Percentage distribution of pattern of fascicular block in relation to location of AMI.

in terms of age, sex, habitual risk factors of the studied patients.

Age is a non-modifiable risk factor for coronary atherosclerosis. Increasing age was associated with increasing incidence of coronary atherosclerosis. In present study the figure-I has shown that the mean age of the studied patient was 52.5±10.4 years ranging from 35 to 80 years. Highest percentage (38%) was in the age group between 51-60 years. The mean age of group-1 patient was 54.2±10.0 years and in group-II was 50.7±10.8 years.Analysis revealed that mean age difference between two groups of patients was statistically insignificant (p>0.05).

Among group-1 patients the highest percentage of age group was in between 51to 60 years and lowest (16%) below 40 years. In group –II highest percentage (38%) was in age group was in between 41-50 years and near equal percentage was below 40 years. This is consistent with study of Sokolow and Mcllroy [6]. In this study incidence of AMI was in mid sixties. In the study of Kostuk & Beanlands it has been found that highest age incidence was in between 60-69 years [4,7]. In the series of Amanullah et al, 28% of patients were in the age group between 50-59 years[8]. In our study it was found that 19% of AMI developed in younger age group, whereas in the study of Amanullah et al had 10% of young AMI patients in the series of 270 patients. This indicates that age incidence of disease pattern is gradually changing which reflects socio-environmental changes.

The mean age of male Patients was 51.0±9.9 years and the mean age of female patients was 58.o±10.4 (Fig-II). Analysis reveals that the mean age of the female patients was significantly higher than the male patients and the difference was statistically significant. It was found that among the male patients age ranges 51to 60 years (29.5%) was high whereas the female patients the age ranges from 61 years and above was high 40.9%.

In this study the number of male patients was significantly higher than that of female patients. The male patients were three and half times of female patients and the ratio was 3.55:1.In the study of Nimetz et al had 50 males and 21 females in their study[9]. The study of Goldman et al had 51 males and 17 females in their study[5,10]. The ratio was 3:1. This might be fact that females are less likely availed health facilities due to their conservativeness and the physiological ground (development of IHD is low before menopause because of protective action of natural estrogen).

In this study it was found that highest percentage

had the history of smoking (67%) followed by HTN 39%, DM (39%), family history of IHD (22%) and dyslipidaemia (19%). Analysis reveals that no statistically significant difference was found between two groups of patients. P value was <0.05. In an another study it was found that smoking as highest number 82% followed by HTN 58.9%, DM 47.1% And family history of IHD 40.4% [11].

In the study of Alan et al, there was statistically significant difference between two groups of patients (P>0.05) in terms of risk factor [2, 12]

Among the studied patients 66% had anterior MI and 34% had inferior MI. Highest percentage of patients presented with isolated RBBB(54.0%), followed by LBBB(18%), bi-fascicular(16.0%), tri-fascicular block(8.0%) and isolated LAHB(4.0%). Among the patients with anterior MI, highest percentage presented with RBBB(42.4%) followed by bi-fascicular block (24.2%),LBBB(15.2%) and LAHB(6%) where as With inferior MI,76.5 percentage had RBBB followed by LBBB(23.5%). It was found that fascicular blocks were seen in the form of RBBB, LBBB,LAHB, Bi-fascicular block and tri-fascicular block. Left posterior hemi block was not found in this study. Marrot and Hogan found the left posterior hemi block in only .08% of cases[13]

Among the fascicular block RBBB was the highest in number (54%), Next common fascicular block was LBBB (18%). The least common was LAHB (4%). LAHB, Bifascicular & tri-fascicular block were not found in inferior AMI. In the study of John et al found the similar incidence of LBBB & RBBB in AMI [14]. Alan et al had found less number of LBBB than RBBB in inferior AMI [2,12]. In the study of Hindman et al the most common type of Fascicular block was LBBB (38%) [3,15].

**Conclusion:** In this study majority of the patients were male. Most of the patients were in the age group 50-60 years. Number of anterior MI was higher (66%) than inferior MI (34%). Anterior MI showed highest incidence of fascicular block than inferior MI which is statistically significant Among the fascicular blocks, RBBB was the highest (54.0%) and next common fascicular block was LBBB, least common was LAHB.

Left posterior hemi-block was not found in this study. Statistical variation among the different types of fascicular blocks observed in this study was significant. Smoking was the most important risk factor. So, fascicular blocks following acute MI are more prone to develop complications than acute MI without fascicular block. Message is that patient with fascicular blocks following acute MI needs special care and treatment.

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