

Research Article

Arrhythmia and Conduction Disturbance in Myocardial Infarction**Bhupendra Singh Bhalavi^{1*}, Venugopal Margekar², Dharmendra Dwivedi³**^{1,2}Senior Resident, Department of Medicine, GRMC Gwalior (M.P.), India.³Ex Post Graduate, Department of Medicine, GRMC Gwalior (M.P.), India.***Corresponding author**

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Abstract: Myocardial infarction is a key component of the burden of cardiovascular disease. Survivors of a first acute myocardial infarction (MI) face a substantial risk of further cardiovascular events, including death, recurrent MI, heart failure, arrhythmias, angina, and stroke. The aim of our study was to determine the incidence of arrhythmia and conduction disturbance in patients of myocardial infarction. 100 patients of MI taken in this study and was conducted in department of medicine, Gajara Raja Medical College Gwalior (M.P.), India, between year 2012 and 2013. This study showed myocardial infarction is predominant in male of age group 50-70 years. Maximum arrhythmia patients had ventricular premature complexes, sinus tachyarrhythmias and sinus bradyarrhythmias. Arrhythmia requires monitoring and prompt treatment before development of its complications.

Keywords: Arrhythmia, myocardial infarction, ventricular premature complex

INTRODUCTION

Myocardial infarction (MI) is defined pathologically as myocardial cell death resulting from ischemia. In the clinical setting these conditions are met under the following circumstances. Detection of a rise and/or fall of cardiac biomarkers, preferably troponin together with evidence of myocardial ischemia as recognized by at least one of the following; symptom of ischemia, ECG changes of new ischemia or new regional wall motion abnormality[1]. Mortality data from the Registrar General of India shows that cardiovascular diseases are a major cause of death in India now. In terms of absolute numbers this translates into 30 million coronary heart disease patients in the country [2]. In India, 31.7% of deaths occur due to MI. Incidence of cardiovascular diseases was about 7% in 1970 and increased up to 32% in 2011 in India [3]. Cardiac arrhythmias are any abnormality or perturbation in the normal activation sequence of the myocardium. The sinus node, displaying properties of automaticity, spontaneously depolarizes, sending a depolarization wave over the atrium, depolarizing the atrioventricular (AV) node, propagating over the His Purkinje system, and depolarizing the ventricle in systematic fashion. There are hundreds of different types of cardiac arrhythmias [4]. Atrioventricular (AV) conduction disturbance (block) describes impairment of the electrical continuity between the atria and ventricles. Clinical classification of AV block has utilized biophysical characteristics, usually the extent

(1st, 2nd, 3rd degree) and site of block (above or below His bundle) [5].

The aim of this study was to determine the incidence of arrhythmia and conduction disturbance in patients of myocardial infarction.

MATERIALS AND METHODS

This study was conducted in department of medicine, Gajara Raja Medical College Gwalior (M.P.), India, between year 2012 and 2013. Total 100 patients of myocardial infarction were taken in this study. All the patients were subjected to detail history and clinical examination. ECG and routine investigation were done. Electrocardiographic monitoring was done by multi-parameter cardiac monitors for first 48 hours after admission. Any arrhythmic events or conduction blocks are noted and data is analyzed.

RESULTS

This study includes 100 patients of MI in which 84% were males and 16% females. This shows male preponderance in myocardial infarction (Table 1).

According to age wise distribution, maximum patients belong to age group 51-60 years (49%) followed by 61-70 years (25%) (Table-2).

In our study maximum no. of patients had AWTMI (58%). IWTMI was found in 38% and NSTEMI in 4% patients (Table-3).

Arrhythmia was found in 45% of patients in which maximum had VPCs (19%) and 17% had sinus tachyarrhythmia. 11% patients had sinus bradyarrhythmia while 55% patient had no arrhythmia (Table-4).

78.9% of VPCs patient had AWTMI while 21.1% of patients of VPCs had IWMI (Table-5).

Sinus tachyarrhythmia was found in 17 patients out of which 11(64.7%) patients had AWTMI and 5(29.4%) had IWMI (Table-6).

11 patients had sinus bradyarrhythmia that include 2 (18.2%) AWTMI and 9(81.8%) IWMI (Table-7).

In distribution of patients on the basis of fascicular block and MI type, 18 patients of fascicular block found, out of which 12 (66.6%) had RBBB and 4 (22.2%) had LBBB (Table-8)

Atrio-ventricular block was found in 5 patients (3 of first degree and 2 of second degree block) all of which belongs to IWMI (Table-9).

Table-1: Gender wise distribution of patients (n=100)

	Males	Females
No. of patients	84	16

Table-2: Age wise distribution of patients

Age group	No. of patients
≤30	01
31-40	0
41-50	10
51-60	49
61-70	25
>71	15

Table-3: Distribution of patients according to Type of MI

MI type	No. of patients
AWMI	58
IWMI	38
NSTEMI	04

AWMI- anterior wall myocardial infarction

IWMI- Inferior wall myocardial infarction

NSTEMI- Non ST elevation myocardial infarction

Table-4: Distribution of patients according to types of arrhythmia

Type of arrhythmia	No. of patients	% of patients
VPCs	19	19%
Sinus Tachyarrhythmia	17	17%
Sinus Bradyarrhythmia	11	11%
APCs	01	01%
VT	03	03%
AF	01	01%
No arrhythmia	55	55%

VPC- Ventricular premature complex

APC- Atrial premature complex

VT- Ventricular tachyarrhythmia

AF- Atrial fibrillation

Table-5: Distribution of patients of VPCs according to MI type (n=19)

MI type	No. of patients	% of patients
AWMI	15	78.9%
IWMI	04	21.1%
NSTEMI	0	0%

Table-6: Distribution of patients of sinus tachyarrhythmia according to MI type (n=17)

MI type	No. of patients	% of patients
AWMI	11	64.7%
IWMI	05	29.4%
NSTEMI	01	5.8%

Table-7: Distribution of patients of sinus bradyarrhythmia according to MI type (n=11)

MI type	No. of patients	% of patients
AWMI	02	18.2%
IWMI	09	81.8%
NSTEMI	0	0%

Table-8: Distribution of patients according to fascicle block and MI type

Type of fascicle block	AWMI	IWMI	Total no. of patients
LBBB	03	01	04(22.2%)
RBBB	08	04	12(66.6%)
LAHB	01	0	01(5.5%)
LPHB	0	01	01(5.5%)
Total	12	6	18

LBBB- Left bundle branch block

RBBB- Right bundle branch block

LAHB- Left anterior hemi block

LPHB- Left posterior hemi block

Table-9: Distribution of patients according to atrio-ventricular (AV) block and MI type

Degree of AV block	AWMI	IWMI	Total no. of patients
1 st degree	0	03	03
2 nd degree	0	02	02
3 rd degree	0	0	0

DISCUSSION

In this study of 100 MI patients, 84 patients were male and 16 females this shows males are more affected with myocardial infarction than females. In our study most of the patients belongs to age group 51-70 years (74% patients). This is comparable to the National Registry of Myocardial Infarction [6] which showed mean age of 66.4 years for acute MI. In our study of arrhythmia in MI, 58% patients had AWMI, 38% IWMI and 4% NSTEMI. This is comparable to the study of Muhammad Bilal S [7] who had 52% AWMI and 48% IWMI.

Maximum number arrhythmic patients had VPCs 19% followed by sinus tachyarrhythmia 17%. This is similar to the study of Tahereh T [8] which showed 20% of VPCs patient of all arrhythmias. Of 19 patients of VPCs 15 patients (78.9%) had AWMI in our study. Study done by Muhammad Bilal S [7] had 66% patients of VPCs with AWMI.

Sinus bradyarrhythmia was found in 11 patients in which 2 had AWMI and 9 had IWMI. This shows bradyarrhythmias are more common with IWMI. 18 patients of fascicular block found in our study out of which 12 patients (66.6%) had

RBBB. The study done by S. Behar [9] showed 79% patients of bundle branch block had RBBB. The study done by Hackel d. B [10] stated that BBB found in 13% patients while in our study BBB found in 18 patients (18%). Total 5 patients of AV block found in our study all of them had IWMI.

CONCLUSIONS

Cardiac arrhythmia matters because when arrhythmias are severe or long-lasting, the heart may not be able to pump enough blood to the body. It may cause cardiac arrest, syncope, CVA stroke, organ damage example brain, kidneys, lungs or liver and can cause death, so it should not be ignored and should be monitored carefully and treated appropriately. Most of the patients of MI were found in the age > 40 years with male predominance. Tachyarrhythmias and VPCs are common in AWMI while bradyarrhythmias and AV blocks are common in IWMI.

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