ORIGINAL ARTICLE

Conduction Abnormalities after ST-Segment Elevation Acute Myocardial Infarction

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ABSTRACT

Objective: To determine the incidence and types of conduction disturbances after acute myocardial infarction and mortality among this group of patients.
Study design: Observational study
Place of study: Deptt. of Cardiology, B.V. Hospital Bahawalpur from 1st April 2010 to 31st March 2011.
Methodology: The study population comprised of 1397 patients. Data regarding age, gender, type of myocardial infarction and the type of conduction disturbance was recorded on a predesigned proforma. The type of treatment modality used to overcome such conduction disturbances was also documented. The cardiac rhythm of all these patients was reassessed before discharge.
Results: In our study, 6.5% of the patients presenting with acute myocardial infarction suffered from rhythm abnormalities. Mobitz type I second degree AV block was found in 2.4% of the patients, sinus bradycardia being the second most common form of conduction abnormality. Conduction disturbances were more common in association with inferior wall MI. Most of the bradycardias associated with inferior wall MI responded to Inj. Atropine and fluid therapy. Conduction disturbances required transvenous pacing in 25 patients. Out of these 25, 3 patients having complete heart block after anterior wall MI required permanent pace maker. During hospital stay, 7 patients died.
Conclusion: Most the conduction abnormalities occurring after acute myocardial infarction are only transient and if managed timely and correctly, can reduce the mortality among this group of patients.
Keywords: Acute myocardial infarction, Mobitz type I and II AV block, Right bundle branch block

INTRODUCTION

The association of conduction abnormalities with acute myocardial infarction (MI) has great prognostic significance. Management of these disturbances may vary with the location of the infarction, the type of conduction disturbance, associated clinical findings, and the extent of hemodynamic compromise. Patients developing bradycardias and hemodynamic compromise require transvenous pacing whereas such disturbances associated with inferior wall MI can be treated with atropine. The highest risk conduction disturbances occur in the setting of anterior wall ST-segment elevation myocardial infarction (STEMI) and are generally right bundle branch block (RBBB) with or without concomitant fascicular block. In the setting of inferior wall MI, the conduction disturbances are first degree atrioventricular (AV) block, Mobitz type I or II second degree AV-block, and complete heart block[1]. Complete heart block (CHB) is an important clinical complication in patients hospitalized with acute myocardial infarction (AMI). Prior studies have suggested that approximately 4% to 7% of patients hospitalized with AMI will develop CHB[2-5]. Previous studies have shown that patients with CHB are between 2–5 times more likely to die during hospitalization for MI compared to patients who do not develop CHB[6-8].

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METHODOLOGY

The study was conducted in the department of Cardiology, Bahawal Victoria Hospital Bahawalpur from 1st April 2010 to 31st March 2011. During this time period, 1500 consecutive patients presenting with the diagnosis of acute myocardial infarction were enrolled in the study. Among these patients, 103 had a history or documented proof of previous or ongoing conduction abnormalities. So all such patients were excluded from the study and finally 1397 patients were considered to be the study population. Data regarding age, gender, type of myocardial infarction and the type of conduction disturbance (if occurred at the time of presentation or during hospital stay; like first, second or third degree AV block as well as right or left bundle branch block) was recorded on a predesigned proforma. The type of treatment modality used to overcome such conduction disturbances (Inj. Atropine, intravenous fluids,

transvenous pacing) was also documented. The cardiac rhythm of all these patients was reassessed before discharge. The date was analyzed using SPSS software version 10.

RESULTS

In our study, 6.5% of the patients presenting with acute myocardial infarction suffered from rhythm abnormalities (Table 1). Mobitz type I second degree AV block was found in 2.4% of the patients (n=34), sinus brdycardia being the second most common form of conduction abnormality (Table 2). Conduction disturbances were more common in association with inferior wall MI than with the infarction of other regions of myocardium (Fig. 1). Most of the bradycardias associated with inferior wall MI responded to Inj. Atropine and fluid therapy. Conduction disturbances required transvenous pacing in 25 patients. Out of these 25, 3 patients having complete heart block after anterior wall MI required permanent pace maker. During hospital stay, 7 patients died (all having complete heart block after anterior wall MI). All other patients (n = 81) were having normal cardiac rhythm at the time of discharge.

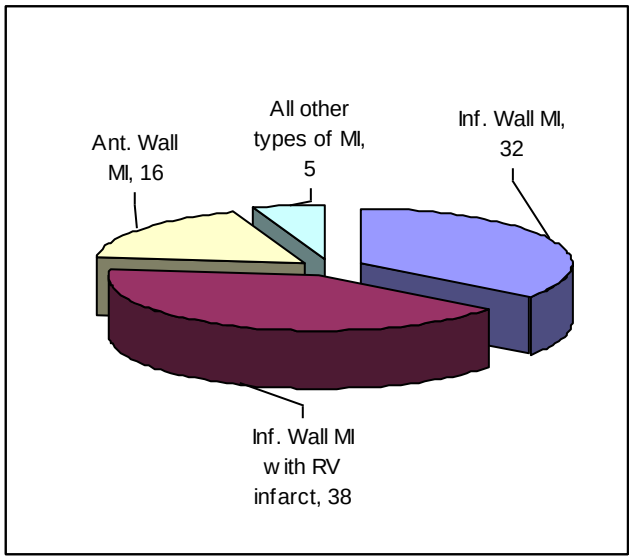
Table 1: Characteristics of patients and their presentation

Variable	**Value**
Mean age (years)	53±11
Gender	
Male	992(71%)
Female	405(29%)
Regions of infarction	
Inferior wall MI	587(42%)
Anterior wall MI	489(35%)
Lateral wall MI	196(14%)
Combination	125(9%)
Conduction disturbances	91(6.5%)

Table 2: Particulars related to conduction disturbances

Variable	**Value**
Conduction Abnormalities	
First degree AV Block	8
Mobitz type I second degree AV Block	34
Mobitz type II second degree AV Block	5
Complete heart block	13
Sinus bradycardia	21
RBBB without fascicular block	7
RBBB with fascicular block	3
Treatment Modality	
Inj. Atropine	39
Intravenous fluids	27
Transvenous pacing	22
Permanent pace maker	3
Deaths	7

Fig. 1: Conduction abnormalities according to regions of infarction (Labels show number of patients)



DISCUSSION

Atrioventricular (AV) block is a common complication of acute Myocardial Infarction (MI). In pre-thrombolytic era, high (second or third) degree AV block was seen in approximately 5-7% of patients presenting with acute MI[9]. Although the advent of thrombolytic therapy has decreased the mortality associated with acute MI but the incidence of AV block, particularly in case of inferior wall MI still remains high.[10] The occurrence of high degree AV block is usually explained by the fact that the blood supply to the AV node depends in 90% of patients on the Right Coronary Artery (RCA)[11-13]. The mechanisms responsible for infarct-related arrhythmias include autonomic nervous system imbalance, electrolyte disturbances, ischemia, and slowed conduction in zones of ischemic myocardium.[14] Many studies have reported that the incidence of mortality in patients of myocardial infarction with heart block varies between 12 and 29%[9,13,15,16]. In our case, the conduction disturbances occurred in 6.5% of the sufferers of acute MI and the mortality rates among this category of patients in our study was 7.6% (7 out of 91) which was lower as compared to the earlier published data[9,13,15,16].This may be an incidental finding but the reason may be timely presentation after the onset of symptoms as well as quickly determinig the rhythm problems and executing a rapidly constructed management plan.

CONCLUSION

Most the conduction abnormalities occurring after acute myocardial infarction are only transient and if

managed timely and correctly, can reduce the mortality among this group of patients.

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