

FREQUENCY OF COMPLICATIONS OF ANTERIOR WALL MYOCARDIAL INFARCTION

Areeba Riaz¹, Majid Kaleem², Sobia Mughal³

¹⁻³Department of Cardiology, Gulab Devi Educational Complex, Lahore - Pakistan

Address for Correspondence:

Areeba Riaz,
Department of Cardiology, Gulab Devi Educational Complex, Lahore - Pakistan

Emails: ariaz1891@gmail.com

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Contribution

AR conceived the idea and planned study. MK,SM helped in collection , assembly and interpretation of the data. AR did critical revision of the article for important intellectual content. All authors contributed significantly to the submitted manuscript.

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ABSTRACT

Objective: To determine the frequency of different complications of anterior wall myocardial infarction .

Methodology: This cross sectional study was conducted from 1st June to 31st December 2016 at Gulab Devi Chest Hospital, Lahore. All acute anterior wall MI patients aged between 22 to 90 years of age, fulfilling the inclusion criteria , were selected . Questionnaire was made to collect data. It included the history and clinical findings to study the complications of anterior wall MI. Clinical diagnosis was made using ECG, echocardiography and chest X-ray. SPSS version 16 was used for data entry and its analysis.

Results: Total of 100 patients were included. The mean age of our patients was 53.83 ± 10.6 years. Majority of patients (80%) were males. The most common complication was left ventricular dysfunction, present in 49% of patients, in whom 24% patients had mild, 18% had moderate and 58% had severe LV dysfunction. Other complications such as right ventricular failure occurred in 10% patients, while 10% patients suffered from cardiogenic shock. About 8% of patients had arrhythmias, infarct extensions were found in 6% patients, 5% had pericarditis, ventricular aneurysms occurred in 4% patients, stroke was seen in 3% of patients and the mechanical complications such as mitral regurgitation and ventricular septal rupture occurred in 12% and 3% of patients, respectively.

Conclusion: Anterior wall myocardial infarction may lead to a number of complications, commonest being left ventricular dysfunction followed by heart failure, cardiogenic shock, acute MR and stroke.

Key Words: Acute myocardial infarction, Coronary artery disease, Left ventricular failure, Cardiogenic shock

INTRODUCTION

Approximately one-third of persons in the world die of cardiovascular diseases, largely due to coronary artery disease and stroke, and 80% of these deaths from cardiovascular diseases occur in developing countries. The greater proportion of deaths is due to heart disease and more specifically coronary artery disease, of which myocardial infarction is a major manifestation.

Several complications may occur in the first few days following anterior wall MI including mechanical complications such as heart failure, cardiogenic shock, ventricular aneurysms, ventricular septal rupture (VSR), LV thrombus and mitral regurgitation (MR); ischemic complications such as infarct extensions; thromboembolic complications such as limb ischemia, renal infarction, pulmonary embolism and stroke; arrhythmic complications such as supraventricular tachycardia, atrial fibrillation, atrioventricular blocks, ventricular premature beats, ventricular tachycardia and ventricular fibrillation and inflammatory complications such as pericarditis.³

Left ventricular failure is the most common complication after anterior wall MI, accounts for up to 40% cases, and the severity of dysfunction correlates with the extent of myocardial injury. Mitral regurgitation of mild to moderate severity occurs in 13 to 45% of patients with anterior wall MI and is associated with increased mortality.

As these complications can cause serious morbidity and mortality, our study was aimed to see the frequency of different complications of anterior wall MI, so that these complications can be diagnosed and managed timely and appropriately.

METHODOLOGY

This was a cross sectional study consisted of all patients with anterior wall MI presented between June to December

2016 at CCU of Gulab Devi Chest Hospital, Lahore. The study was completed in six months. Purposive sampling technique was used to collect the data. Patients aged between 22 to 90 years of either gender, who had ST elevation anterior wall MI and had their echocardiography done were included in the study. Patients with ST elevation inferior wall MI, non ST elevation MI and other valvular, arrhythmic and congenital heart disease patients were not included in the study. After taking consent, their demographic information was taken.

Clinical diagnosis was established based on signs, symptoms and positive findings on electrocardiography, x-ray and echocardiography. All data was collected through pre designed questionnaire. Statistical package for social sciences (SPSS) version 16 was used for data entry and its analysis. Descriptive statistics was used to express quantitative data while qualitative data like gender and frequency of different complications of anterior wall MI were presented using frequency tables.

RESULTS

A total of 100 patients with anterior wall MI were employed. Mean age of our patients was 53.83 ± 10.6 years (range 22-90 years). Majority of patients (80%) were males. The most common complication was left ventricular dysfunction, present in 49 (49%) patients documented on echocardiography. Out of them 24% patients had mild, 18% had moderate and 58% had severe LV dysfunction. Other complications encountered were right ventricular failure, cardiogenic shock, arrhythmias, infarct extensions, pericarditis, ventricular aneurysm, stroke, mitral regurgitation and ventricular septal rupture (Table 1).

DISCUSSION

Acute myocardial infarction (AMI) due to coronary artery disease is a leading cause of death in both the developed and developing countries. The emergence of coronary care units

Table 1: Frequency of Complications of Anterior Wall MI in study population (n=100)

	Frequency	Percentage (%)
Left Ventricular dysfunction	49	49
Mitral Regurgitation	12	12
Cardiogenic Shock	10	10
Right Ventricular Failure	10	10
Arrhythmias	8	8
Infarct extension	6	6
Pericarditis	5	5
Ventricular aneurysm	4	4
Ventricular septal rupture	3	3
Stroke	3	3

and early reperfusion therapy (Thrombolytic and Percutaneous Coronary Intervention) has considerably decreased the complications and so the in-hospital death rates, the result is an improved outcome in survivors of the acute phase of MI. In our study, we examined the frequency of different complications of acute anterior wall MI.

According to the study of Reid et al., infarct extension occurred in 86% patients with uncomplicated anterior infarcts. Fraker et al., reported 9.4% cases of infarct extensions in patients admitted from an outpatient facility for acute MI. Since most infarct extension occur within the first few days of hospitalization, therapeutic interventions must be initiated in all patients soon after admission. In our study of anterior wall MI, only 6(6%) patients had infarct extension as the patients were hospitalized with provision of early interventions.

LV dysfunction is the single most important predictor of mortality following AMI. Of total, 49(49%) patients had left ventricular dysfunction. However, only 10(10%) had right ventricular failure as it is more common complication of inferior wall MI rather than anterior wall MI. Our study results correlates with that of Kinch and Ryan, which also had 50% patients with left ventricular infarction and only 13% with right ventricular failure.

Cardiogenic Shock is the leading cause of death in patients hospitalized for acute MI. According to the study of Hochman et al., mechanical causes of cardiogenic shock, including VSR, acute severe MR, and tamponade, all requiring early recognition and repair, accounted for 12% of cases. Our study of anterior wall MI accounted for up to 10(10%) cases of cardiogenic shock and is close to the results of Hochman et al., which had 12% of cases.

According to the study of Body and Order, MR of mild to moderate severity occurs in 13% to 45% of patients with MI and was associated with increased mortality. Papillary muscles rupture (PMR) accounts for 7% of the cases of cardiogenic shock and 5% of mortality after AMI. In our study MR is mostly transient, asymptomatic, and benign. Echocardiographic studies, documented that only 12% patients had mitral regurgitation nearly equal to the study of Body and Order.

Free wall rupture is a recognized cause of mortality in patients with acute MI. In a study conducted by Di Summa et al., ventricular septal rupture represented a serious complication after acute myocardial infarction with an incidence of 1-2%. In our study, only 3% patients had ventricular septal rupture following acute MI.

Thadani et al., reported that 6.8% patients admitted to coronary monitoring unit with acute MI developed pericardial friction rub. The patients with pericarditis manifested a longer period of pyrexia, a greater rise in serum enzymes, and a higher incidence of major arrhythmias and of

radiological pulmonary edema. We came with the results that 5(5%) patients had pericarditis. Our result being strongly supported by the above study as it came up with 6% of the affected patients.

Early formation of a functional aneurysm occurs after anterior myocardial infarction and carries a high risk of death within one year that is independent of ejection fraction. Our study results (4%) correlates with the study of Dubnow et al. who reported that 3.5% patients had ventricular aneurysms following old or recent MI.

According to the study of Mulasari et al. The incidence of clinically evident systemic embolism after MI is approximately 2%, mural thrombus around 5% and incidence is higher among patients with anterior wall MI. Systemic embolism most often results in a stroke, although patients may have limb ischemia, renal infarction and mesenteric ischemia. Here we came across with 3% cases of thromboembolism nearly equal to the results of Mulasari et al.

In our study of complications of anterior wall MI, we found 8% cases of arrhythmia while Kuchar et al. reported that the incidence of arrhythmias is higher in patients, the earlier they are seen after the onset of symptoms. According to their study, 7.1% patients had arrhythmic events; among whom 3.8% patients died suddenly while 3.3% presented with sustained symptomatic ventricular tachycardia.

Basic knowledge of the complications that occur in the post infarction period, and the clinical syndrome associated with each, facilitates the physician to evaluate and treat the complication in a confident and timely manner. Patients suspected of complications of myocardial infarction should be urgently transferred to a medical center experienced in the management of these problems. For deteriorating patients without identifiable complications, coronary angiography and reperfusion with direct angioplasty should be considered.

CONCLUSION

Anterior wall myocardial infarction may lead to a number of complications. The commonest complication being left ventricular dysfunction followed by heart failure, cardiogenic shock, acute MR and stroke. The onset of each of these complications usually results in devastating results.

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