

ST ELEVATION MYOCARDIAL INFARCTION: AN EXPERIENCE AT LADY READING HOSPITAL, PESHAWAR, PAKISTAN

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ABSTRACT

OBJECTIVE: To find out the clinical characteristics, treatment offered and outcome of patients with ST elevation myocardial infarction (STEMI) admitted to cardiology unit Lady Reading Hospital (LRH), Peshawar, Pakistan.

METHODS: This retrospective observational study was conducted in Cardiology Unit, LRH, Peshawar, Pakistan by analyzing record of all diagnosed STEMI patients of age >18 years, from 1st January to 31 December 2013.

RESULTS: Total number of patients admitted with STEMI were 1733 (46.02% of total coronary artery disease admission). Of all these patients with STEMI, fibrinolytic therapy with streptokinase were given to 1380 (79.6%) patients, while 343 (19.8%) were late for fibrinolytic therapy or having some contraindication to fibrinolytic therapy. Ninety four (5.4%) patients received primary or rescue percutaneous coronary intervention (PCI). Out of 1733 patients, males were 1085 (62.60%), female were 648 (37.40%), mean age was 57.42 ± 8.7 years, diabetes was found in 458 (26.39%) cases, hypertension in 679 (39.18%) cases, smokers were 183 (10.5%). Family history of coronary artery disease (CAD) was found in 205 (11.82%) cases, past history for CAD was present in 305 (17.5%) patients and anterior wall myocardial infarction & new onset left bundle branch block was found in 790 (45%) cases. In-hospital mortality was 158 (9.1%).

CONCLUSION: About 46% of patients admitted with CAD were having STEMI, of them 80% receive streptokinase while only 5.4% were subjected to primary or rescue PCI. In-hospital mortality is about 9%. Anterior wall MI was the most frequent AMI.

KEY WORDS: Coronary Artery Disease (MeSH), STEMI (Non-MeSH), ST elevation myocardial infarction (Non-MeSH), Myocardial Infarction (MeSH), Streptokinase (MeSH), Percutaneous Coronary Intervention (MeSH), Hospital Mortality (MeSH), Thrombolytic Therapy (MeSH).

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INTRODUCTION

Acute myocardial infarction (AMI) is an important cause of morbidity and mortality in the developing world.¹ There are certain risk factors which predisposes to AMI which are categorized as modifiable (hypertension, diabetes, high blood

cholesterol, smoking, physical inactivity and obesity) and non-modifiable (age, sex and family history of heart disease).¹ Significant differences in the prevalence of coronary artery disease (CAD) exist with respect to gender, age and ethnicity. Risk factors for ischemic heart disease

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and AMI are on the rise in developing countries like Pakistan. Cardiovascular diseases is now the leading cause of death in the Indo-Pakistan subcontinent.^{2,3} ST elevation myocardial infarction (STEMI) is not only an important public health problem in industrialized countries but is also becoming an increasingly significant problem in developing countries.⁴ There are estimated 500,000 STEMI events per year in the U.S.^{5,6} Advances in reperfusion therapy for STEMI provide optimal patient outcomes. Reperfusion therapies include primary percutaneous coronary intervention (PCI) and thrombolysis and rarely coronary artery bypass graft (CABG).⁷ We conducted this retrospective, observational study to know about the clinical characteristics, treatment offered and outcome of patients with STEMI admitted to cardiology unit of a tertiary care unit in Peshawar, Pakistan. The rationale of our study is to know the burden of STEMI in our hospitalized patients and the standard of treatment offered to these patients. This study will give the insight for allocation of funds for standard of care to the hospitalized STEMI patients.

METHODS

This retrospective observational study was conducted from hospital record of all STEMI patients admitted in cardiology unit Lady Reading Hospital, Peshawar, Pakistan from 1st January 2013 to 31 December 2013. Ethical approval for the study was taken from institutional ethical committee. All the data were retrieved from the hospital patient data base. All the consecutive patients of age more

than 18 years of any gender, diagnosed as acute STEMI were included in the study. STEMI was defined as clinical presentation with chest pain > 20 minutes and ST elevation of more than 1mm in at least 2 contiguous leads or new onset left bundle branch block on 12 lead ECG. All the demographic data including age, gender, anthropometric measures and traditional cardiovascular risk factors (smoking, hypertension, and diabetes mellitus) were entered to a predefined Performa from patient's record. The two modes of presentations (typical- chest pain, sweating and atypical- epigastric/neck/shoulder pain, painless) and duration of symptoms onset (0-6, 6-12, 12-24 and > 24 hours) were also documented from patient record. From 2013 patient record, the patients were categorized into having normal physical examination and those having signs of left ventricle failure (S3/gallop rhythm and basal crackles). The regions of infarction (anterior, inferior and combination), rhythm disturbances (sinus vs. atrioventricular block) and treatment offered were also documented from hospital record. Inferior myocardial infarction (MI) was defined as ST eleva-

tion in ECG lead II, III and AVF. Anterior MI was defined as ST elevation in ECG leads from v1 to v6. Posterior MI was defined as ST depression in V1 to V3 and R wave in V1 and V2. Lateral wall MI was defined as ST elevation in ECG leads I and aVL. Successful thrombolysis was defined as the resolution of chest pain with at least 50% resolution of ST segment elevation after given intravenous streptokinase. Primary PCI was defined as the coronary angioplasty offered to ST elevation MI patients within 12 hours of onset of symptoms who were not given streptokinase. Rescue PCI was defined as the coronary angioplasty offered to ST elevation MI patients after unsuccessful thrombolysis. Statistical analyses were performed by the use of SPSS version 19. Descriptive analysis was mainly used.

RESULTS

From analyzing the hospital record of 2013, patients admitted with STEMI were 1733; 46.02% of total CAD admissions. Of all these patients with STEMI, fibrinolytic therapy with streptokinase were given to 1380 (79.6%) patients, while 343(19.8%) were late

for fibrinolytic therapy or having some contraindication to fibrinolytic therapy. Of all these patients, males were 1085 (62.60%), female were 648 (37.40%), Mean age was 57.42 ± 8.7 years, diabetes was found in 458 (26.39%), hypertension in 679 (39.18%), smokers were 183 (10.5%), family history of CAD was documented in 205 (11.82%), while 305 (17.5%) patients were having past history of significant coronary artery disease. Among all STEMI patients 158(9.1%) expired during hospital admission. Atrial fibrillation occurred in 108 (6.28%) & ventricular arrhythmia in 276 (15.9%) patients. Signs and symptoms of acute heart failure developed in 179 (10.30%) patients. Survival till hospital discharge was 1575 (90.9%). The percentage of various territories involved in STEMI i.e. anterior, inferior and posterior etc. are given in detail in Table I. The various modalities of treatment i.e. streptokinase, primary PCI and rescue PCI offered to STEMI patients is shown in Table II.

DISCUSSION

This retrospective, observational study showed 46% STEMI patients out of total CAD patients admitted to Cardiology unit LRH during the year 2013. About 80% of patients received thrombolytic therapy while about 5.4% of patients either undergone primary or rescue PCI. Median hospital stay was 2.8 ± 1.9 days. We compared our study with a study done at Agha Khan University (AKU) Hospital, Karachi which showed that age and risk factor profiles were the same.⁸ Mean hospital stay in our series was shorter, it was 2.8 ± 1.9 days as compared to that in AKU hospital i.e. 4.0 (3.5-6.0) days.⁸ Also mean hospital stay were shorter from that observed in European countries which is 7.0 (5.0-10) Days.⁹ Survival at hospital discharge was also similar between both groups i.e. 90.9% in our study and 91.9% for the AKU hospital.⁸ However, survival rate in our study was less as compared to study conducted in Europe, where survival rate was 93.1% for European patients. The majority of patients in both groups were characterized as being in Killip class I on presentation, since they had no evidence of heart failure or cardiogenic shock on arrival.

In our study, about 80% received fibri-

TABLE I: TERRITORY INVOLVEMENT IN ST ELEVATION MYOCARDIAL INFARCTION (STEMI) ON ECG

Type of STEMI	Frequency (n= 1733)	Percentage
Anterior wall MI & New onset Left bundle branch block (LBBB)	790	45.58
Anterior+inferior wall myocardial infarction	127	7.3
Isolated inferior wall myocardial infarction	334	19.27
Inferolateral wall STEMI	153	8.82
Inferoposterior wall STEMI	190	10.96
Inferior + right ventricular myocardial infarction	86	4.96
Lateral wall STEMI	53	3.05

TABLE II: FIBRINOLYTIC THERAPY AND PRIMARY PCI OFFERED TO PATIENTS

Variables	Frequency (n= 1733)	Percentage
Streptokinase	1380	79.6
Contraindication/Late to fibrinolytic therapy	343	19.8
Primary/Rescue PCI*	94	5.4

*Percutaneous coronary intervention

nolytic therapy whereas the thrombolytic therapy received in AKU hospital were only in 5% of patient. However, study population in their study were just 300 patients as compared to our study cohort of more than 1700 patients.⁸ Similarly about a third of European patients with STEMI received fibrinolytic therapy.⁹ On other hand only 5.4% of our patients with acute STEMI received PCI as compare to 88.4% in AKU hospital and 52.3% in European patients. Again the reason is because of huge burden here in our unit and lack of primary or rescue PCI facilities.^{8,9} Around 5.4% (4.8% for Europeans) patients were treated medically and did not receive reperfusion therapy mostly due to late arrival and completed infarcts. Similarly the late presentation or contraindication for fibrinolytic therapy was about 19% mainly because of high illiteracy and lack of emergency services to reach the hospital in time in this part of the world.^{8,9} We have financial issues in our community. It is the major cause of delay in primary PCI in the country. In the Indian series 58.8% of patients presented later than 4 hours after symptom onset.¹⁰ Jafary et al from the AKU center had reported a mean 4.5 hour delay between symptoms and hospital arrival for patients undergoing primary PCI and 90 minutes for those undergoing thrombolysis.^{11,12} Reasons for delay in presentation by the patient may include lack of awareness as to the significance of symptoms, lack of transport facilities, financial difficulties, and even inaccurate initial diagnosis. In a society where majority of patients do not have access to health insurance, there may be a combination of reasons. Similar to our findings, Xavier et al had reported

government or insurance payment in 12.8% of patients with STEMI in India.¹⁰ Diabetes was present in around 26% of our patients, which is similar to data from India, reported by Xavier et al.¹⁰ Our study findings are also supported by the data from Karachi by Arshad S et al.⁸ Jafary et al. found prevalence of diabetes to be 41.7% and 32.1% in patients with STEMI undergoing fibrinolysis and primary PCI respectively.^{11,12}

Limitation: This was a retrospective observational study and all the data were retrieved from the patient hospital record. This is a single center study. Some of the patients who were given fibrinolytic therapy and were referred to us for rescue PCI were also included in the study.

CONCLUSION

Among coronary artery disease patients admitted in cardiology Unit Lady Reading Hospital, 46% were having STEMI, of them 80% receive Streptokinase while only 5.4% were subjected to primary or rescue PCI. The in-hospital mortality was 9%. Anterior wall MI was the most frequent MI.

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CONFLICT OF INTEREST

Authors declared no conflict of interest

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AUTHORS' CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

SZ: Acquisition, analysis and interpretation of data, drafting the manuscript, final approval of the version to be published

MH: Concept & study design, critical revision, final approval of the version to be published

HJ, MA & RZ: Acquisition of data, drafting the manuscript, final approval of the version to be published, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.