

IN-HOSPITAL MORTALITY IN ELDERLY (>75 YEARS) PATIENTS UNDERGOING PRIMARY PERCUTANEOUS CORONARY INTERVENTION (PCI) WITH ACUTE ST ELEVATION MYOCARDIAL INFARCTION AT AFIC-NIHD RAWALPINDI

Imran Ghani, Waheed Ur Rehman, Muhammad Qaiser Khan, Sohail Aziz, Aysha Siddiqa, Qurban Khan, Shiasta Naseem, Muhammad Asim Farooq

Armed Forces Institute of Cardiology/National Institute of Heart Diseases Rawalpindi

ABSTRACT

Objective: To determine in hospital clinical outcome of primary PCI in elderly patients.

Study Design: Descriptive cross-sectional study.

Place and Duration of Study: This study was performed in Armed Force Institute of Cardiology from November 2011 to December 2014.

Methods: This study consist of 1226, of which 69 were elder (>75 years) patients consecutive acute STEMI presenting to emergency department of hospital.

Results: Angioplasty with stentig was done in 59 (81.1%) patients, whereas POBA only was done in 1 (1.4%) patients. Drug eluting stents (DES) were used in 15(21.7%) and bare metal stents were deployed in 41 (59.4%) patients. Temporary pace maker (TPM) was inserted in 5 (2.2%) patients. Intra aortic balloon pump was used in 3(4.3%) patients. The Median time from the onset of symptoms to arrival in the hospital was 122.5 ± 142.57 and median door to balloon time was 60 ± 22.88 min.

Conclusion: Primary PCI for elderly patients presenting with acute ST segment elevation myocardial infarction is a safe and effective mode of revascularization with high success rate and low mortality.

Keywords: Hospital mortality, Percutaneous coronary intervention.

INTRODUCTION

Ischemic heart disease is most common cause of death in all over the world¹. In the developed countries, coronary artery disease is the most common cause of mortality in patients aged more than 65 years². Myocardial infarction is generally the result of acute rupture or ulceration of an atherosclerotic plaque in a major epicardial coronary artery causing platelet activation and thrombosis resulting in occlusion of the vessel and infarction of the subjacent myocardium³. Over the past decade the incidence of acute MI and mortality decrease in develop country⁴⁻⁵. Elderly patients are at high risk of mortality presenting with acute ST elevation myocardial infarction⁶. Older age, which is consistently one of the main negative prognostic values in most trials⁷⁻⁸. Elderly patients have been under represented in most of the studies. In elderly patients medical treatment is common who present with acute ST elevation MI⁶. Primary percutaneous coronary intervention is

treatment of choice for acute myocardial infarction, provided that this treatment is started within 90 minutes after medical contact⁹⁻¹⁰. Primary PCI is provided to all age group but clinical practice shows that elderly patients presented with acute coronary syndrome are much less likely to undergo angioplasty¹¹. Although elderly patients are high risk group but they get more benefits from primary angioplasty as compared to medical treatment¹¹. Multiple clinical shown that primary PCI is superior to fibrinolysis in acute MI¹²⁻¹⁷. Primary PCI is not commonly practiced in this part of world and few patients get benefits from this treatment presented with acute MI. Primary angioplasty was started in AFIC/NIHD since 2011 during initially but had been extended to off hours now. The aim of this study was to assess in hospital clinical outcome of primary angioplasty in elderly (>75 years) patients presented with acute ST elevation myocardial infarction.

METHODS

The prospective observational study was performed in Armed Force Institute of Cardiology from November 2011 to December 2014. Out of 1226 patients, 69 were included

Correspondence: Dr Imran Ghani, Resident Cardiologist, AFIC/NIHD, Rawalpindi
Email: ghani_kmc@yahoo.com

being elder (>75 years) and present with acute STEMI presenting to the emergency department of hospital. Acute STEMI was diagnosed on basis of clinical history of chest pain of less than 12 hours of duration with electrocardiographic finding of ST elevation of more than 1mm in two or more contiguous leads or new left bundle branch block. The patient was given loading dose of aspirin (300 mg), clopidogrel (300 mg), Statin (40 mg), I/V bolus of unfractionated heparin of 70 IU/Kg body weight and symptomatic treatment for pain and vomiting in emergency department. Written consent was taken from all patients or available next of kin in case of patient unable to sign. Patients were shifted to the catheterization laboratory. Right radial artery approach was commonly used but left radial or femoral artery also used in case right radial artery not palpable. Angioplasty was proceeded after angiography according to set protocol of the hospital. Glycoprotein IIb/IIIa inhibitors two I/V bolus dose were given during procedure and I/V infusion form was given after procedure in case of contraindication. Other medication, selection of stent, Temporary Pacemaker (TPM), use of thrombolytic, Intra aortic balloon pump (IABP) and ventilator support were left according to operator decision. Coronary flow in the infarct related artery was assessed visually by the operator according to the TIMI grading system on a scale of 0 to 3 before and after the PCI. Primary PCI success was defined as achievement of vessel patency with TIMI 3 flow and residual stenosis of less than 20%. After completion of procedure patients were treated in coronary care units (CCU) to step down for 48 to 72 hours. The patients were prescribed all necessary medication as protocol.

A predesigned performa was to be filled by operator including relevant demographic features, presenting features, ECG findings, clinical variables like cardiogenic shock (defined as a systolic blood pressure of < 90 mmHg or requirement of inotropes to maintain a SBP > 90 mmHg) and pulmonary edema, timing variables like door to balloon time, procedural details and outcome.

The primary end point was a composite of death, shock, congestive heart failure, or reinfarction during hospitalization after

Table-1: Characteristics of patients undergoing primary PCI for STEMI.

Baseline Demographic and Clinical characteristics:	n=69 (%)
Mean Age (years)	80
Male (Gender)	62 (89.8)
Female	7(10.1)
Past Medical history:	
Hypertension	26 (37.6)
Diabetes Mellitus	12 (17.3)
Smoking	10 (14.4)
Admission characteristics:	
Cardiogenic shock	4 (5.7)
Left ventricular failure	49 (71.0)
Anterior myocardial infarction	27 (39.1)
Inferior myocardial infarction	38 (55.0)
Lateral myocardial infarction	1 (1.4)
Timing variables:	
Onset of pain to ER time (minutes) median	60
Door to Balloon time (minutes) median	122.5
Glycoprotein IIb / IIIa inhibitors use:	
Started in Emergency room	0(0)
Started in Catheterization laboratory	69(100)

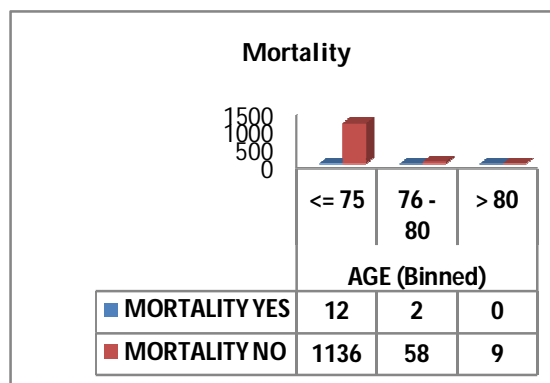


Figure 1: Mortality rates with respect to age.

primary angioplasty. All the variables were entered into the Statistical Package for Social Sciences software, version 19 (SPSS) for statistical analysis. Descriptive statistics were

computed and presented as means and standard deviations for continuous variables like age, and median for timing variables (onset of pain to ER and door to balloon time in minutes). Categorical variables were reported in percentages for the gender, hypertension, diabetes mellitus, cardiogenic shock, left ventricular failure, multivessel disease, various procedural variables, procedural success and mortality.

Statistical analysis

The data was entered in SPSS Statistics software (version 21). Continuous data expressed as median and mean along with standard deviation values. Proportions expressed as percentages. Different groups were compared with either chi-square test. Similarly groups of continuous variables were compared by using student's t-test and a *p*-value of 0.05 is considered significant.

RESULTS

The study comprised of 1226 patients, 69 patients presented with acute STEMI. Demographic variables and clinical features are shown in table-1. The cohort was predominantly male (89.8%) and (10.1%) were female, with a mean age 80 years. Procedural success was achieved in 85.50% (59/69 patients) with in-hospital mortality of 2.4% (2/69 deaths). 12(17.3%) patients were found to be diabetic, 26 (37.6%) hypertensive, and 10(14.4%) patients were smokers. Anterior, inferior and lateral myocardial infarction were present in 17(39.1%), 38(55.0%) and 1(0.4%) patients respectively. Four (5.7%) patients were having cardiogenic shock and left ventricular failure was found in 49 (71%) patients.

The coronary angiographic and PCI details are given in Table-2. Radial approach was the commonest access site in 55 (79.7 %) patients and femoral approach was used in 14 (20.2%) patients. LAD was the commonest infarct related artery accounting for culprit artery in 27 (39.1%) followed by RCA & LCX in 21 (30.4%) and 10 (14.4%) cases respectively. Visible thrombus was present in 22 (11.5%) cases, where as thrombectomy device was actually used in 4 (5.7%) patients. All the patients in the

study population received GP IIb IIIa inhibitor. Angioplasty with stentig was done in 59 (81.1%) patients, whereas POBA only was done in 1 (1.4%) patients. Drug eluting stents (DES) were used in 15(21.7%) and bare metal stents were

Table-2: Angiographic and procedural characteristics of patients undergoing primary PCI for STEMI (n=69).

Access site:	
Radial approach	55(79.7%)
Femoral approach	14(20.2%)
Culprit vessel:	
Left Anterior Descending	27(39.1%)
Left Circumflex	10(14.4%)
Right Coronary Artery	21 (30.4%)
Visible thrombus	22 (11.5%)
Thrombus aspiration	4 (5.7%)
Stents used	59(81.1%)
Plain old balloon angioplasty (POBA)	1 (1.4%)
Intra-Aortic Balloon Pump	3 (4.3%)
TPM	5(2.2%)
Type of stent used:	
DES (In number of patients)	15 (21.7%)
BMS (In number of patients)	41 (59.4%)
Procedural outcome	
Procedural success	59 (85.5%)
Mortality	2(2.4%)

deployed in 41 (59.4%) patients. TPM was inserted in 5 (2.2%) patients. Intra aortic balloon pump was used in 3(4.3%) patients. The Median time from the onset of symptoms to arrival in the hospital was 122.5 ± 142.57 and median door to balloon time was 60 ± 22.88 min.

DISCUSSION

This study was done to determine in hospital mortality of primary percutaneous coronary intervention in patients presenting with acute ST segment elevation myocardial infarction, to the emergency department of this tertiary care cardiac institute. All reperfusion procedures, if indicated, were performed nearly solely by PCI; none of the patients received thrombolysis.

One of the potential explanations for the lower PCI rate as well as the worse primary angiographic results in older patients might be

the more complex and unfavorable anatomy¹⁸. Despite the additional, known, risk factors and a worse expected prognosis in the older patients, the rate of diagnostic coronary angiography and PCI was found to be significantly lower in this high-risk population. However, in comparison with previously published data, the mortality in our study seems to be very low¹⁹. A comparison with any previously published data is rather difficult because of significantly lower catheterization and revascularization rate in previously published consecutive patient groups and a lack of analyzed cohorts of unselected consecutive patients with AMI. Mehta et al. evaluated in-hospital mortality in STEMI patients (age \geq 70 years) treated with thrombolysis and described higher mortality rates compared to our findings (14.4% in PCI-treated patients vs. 17.6% in patients treated with thrombolysis)²⁰. Ishihara et al. recently described in hospital mortality rate was substantially higher in both age groups comparing to our study (11.7% in the patients \geq 70 years and 5.0% in patients $<$ 70 years) 21 Three small randomized studies comparing PCI and fibrinolysis in the treatment of STEMI in the elderly showing reduction in hospital and long term mortality²²⁻²⁴. Majority of the patients were male in this study cohort. Although many previous studies had shown male preponderance, but in our study almost 90% patients were males in contrast to around 70 to 80% in the most other studies. Inferior MI was the commonest infarction observed in our study population followed by anterior MI. LAD was the commonest infarct related artery accounting for about 60.5% of the cases in this study the population followed by RCA in about 31.6% and LCX 7.9%. Similar incidence of culprit artery was found by the other investigators²⁵. Our study also showed that PCI in patients aged more than 75 years is safe. The mortality of our study is 2.4%. Jafary et al. quoted in-hospital mortality of 8.3% (43.9% in cardiogenic shock, 2.1% in non-shock patients)²⁶. Hussain et al. from the same center documented 2.9% mortality²⁷.

CONCLUSION

We conclude that primary PCI for elderly patients presenting with acute ST segment elevation myocardial infarction is a safe and effective mode of revascularization with high success rate and low mortality. Therefore primary PCI should be offered to more and more elderly patients in the presence of required facilities. Our results compare favorably to Western data despite of few limitation in our registry system. Nevertheless, we feel that our data do enable us to make the point that outcomes similar to the West may be possible in developing countries, and further studies are needed taking in account total ischemic time and pre-hospital delay.

Conflict of Interest

This study has no conflict of interest to declare by any author.

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