

# FREQUENCY OF CARDIOGENIC SHOCK IN MIDDLE AGE PATIENTS WITH NON ST ELEVATION MYOCARDIAL INFARCTION

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## ABSTRACT

**Objective:** To determine the frequency of cardiogenic shock in middle age patients with non ST elevation myocardial infarction.

**Material and Methods:** This study was conducted at Cardiology Ward & CCU of Hayatabad Medical Complex, Peshawar. It was a descriptive cross-sectional study which was conducted for 6 months from May 2011 to October 2011 in which 600 patient after undergoing inclusion and exclusion criteria, calculated for 2.5% estimates for cardiogenic shock out of Non ST Elevation myocardial infarction patients, were enrolled.

**Results:** In this study mean age was 60 years with standard deviation  $\pm 1.26$ . Sixty-eight percent patients were male and 32% patients were female. Five percent patients had cardiogenic shock while 95% patients didn't had cardiogenic shock.

**Conclusion:** Cardiogenic Shock is a treatable illness with a reasonable chance for full recovery.

**Key Words:** Cardiogenic, shock, myocardial, infarction, mortality.

## INTRODUCTION

Typical symptoms of acute myocardial infarction include sudden chest pain (typically radiating to the left arm or left side of the neck), shortness of breath, nausea, vomiting, palpitations, sweating, and anxiety (often described as a sense of impending doom)<sup>1</sup>. Women may experience fewer typical symptoms than men, most commonly shortness of breath, weakness, a feeling of indigestion, and fatigue. A sizeable proportion of myocardial infarctions (22–64%) are “silent”, that is without chest pain or other symptoms<sup>2</sup>.

Among the diagnostic tests available to detect heart muscle damage are an electrocardiogram (ECG), echocardiography, cardiac MRI and various blood tests. The most often used blood markers are the creatine kinase-MB (CK-MB) fraction and the troponin levels. Immediate treatment for suspected acute myocardial infarction includes oxygen, aspirin, and sublingual nitroglycerin<sup>3</sup>.

Most cases of myocardial infarction with ST elevation on ECG (STEMI) are treated with reperfusion therapy, such as percutaneous coronary intervention (PCI) or thrombolysis. Non-ST elevation myocardial infarction (NSTEMI) may be managed with medication, although PCI may be required if the patient's risk warrants it. People who have multiple blockages of their coronary arteries, particularly if they also have diabetes

mellitus, may benefit from bypass surgery (CABG). The European Society of Cardiology guidelines in 2011 proposed treating the blockage causing the myocardial infarction by PCI and performing CABG later when the patient is more stable. Rarely CABG may be preferred in the acute phase of myocardial infarction, for example when PCI has failed or is contraindicated<sup>4</sup>.

Ischemic heart disease (which includes myocardial infarction, angina pectoris and heart failure when preceded by myocardial infarction) was the leading cause of death for both men and women worldwide in 2004<sup>5</sup>. Important risk factors are previous cardiovascular disease, older age, tobacco smoking, high blood levels of certain lipids (low-density lipoprotein cholesterol, triglycerides) and low levels of high density lipoprotein (HDL) cholesterol, diabetes, high blood pressure, lack of physical activity and obesity, chronic kidney disease, excessive alcohol consumption, the abuse of illicit drugs (such as cocaine and amphetamines), and chronic high stress levels.

## MATERIAL AND METHODS

The study was conducted after approval obtained from hospital ethical and research committee. All patients with Non ST elevation Myocardial Infarction diagnosed by having characteristic chest pain with raised troponin levels of greater than 0.1ng/dl and standard 12 lead ECG showing ST segment depression of  $> 0.5$  mm, meeting the inclusion criteria were enrolled in the study through OPD or ER department. A written informed consent was obtained after explaining the purpose and benefits of the study.

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All patients were admitted in the cardiology unit of the hospital for further evaluation. A detailed history was taken followed by complete examination and routine set of investigations was done and preformed performa was filled. All patients included in the study were evaluated for Cardiogenic shock and if found were managed as per ward and unit protocols.

The inclusion criteria was all patients with either gender, age above 15 years with non ST-elevation Myocardial infarction whereas all patients were excluded with end stage cardiomyopathy, septic shock with severe myocardial depression, aortic stenosis, hypertrophic obstructive cardiomyopathy, mitral stenosis, left atrial myxoma, and acute mitral regurgitation, chordal rupture on echocardiography.

Data was entered into SPSS version 10. Descriptive statistics was used to describe, organize and summarize data. Mean  $\pm$  standard deviation was calculated for numerical variables like age and time interval between onset of chest pain and ECG diagnosis of non ST elevation myocardial infarction. Frequencies and percentages were calculated for categorical variables like cardiogenic shock and sex. Cardiogenic shock was stratified among age, sex and time interval between onset of chest pain and ECG diagnosis of non ST elevation myocardial infarction to see the effect modification. All results were presented in the form of tables and graphs.

## RESULTS

Age distribution among 600 patients was analyzed as 24(4%) patients were in age range 40-50 years, 132(22%) patients were in age range 51-60 years, 246(41%) patients were in age range 61-70 years and 198(33%) patients were above 70 years of age. Mean age was 60 years with standard deviation  $\pm$  1.26.

Among them, female were 192 and male were 408. Time interval onset of chest pain and ECG diagnosis of MI among 600 patients is shown in Table 1 in which mean on set time was 8 hours with standard deviation  $\pm$  2.71. Frequency of cardiogenic shock among 600 patients was seen in 30 (5%) patients while 570 (95%) patients didn't had cardiogenic shock.

Association of Cardiogenic shock in age distribution was analyzed as among 30 cases of cardiogenic shock. Six patients were in age range 51-60 years. Eight patients were in age range 61-70 years and 16 patients were above 70 years of age. Association of Cardiogenic shock in gender distribution was analyzed as among 30 cases of cardiogenic shock 19 patients were male while 11 patients were female. Association of Cardiogenic shock in time interval onset of chest pain and ECG diagnosis of MI was analyzed as among 30 cases of cardiogenic shock as shown in Table 2.

**Table 1: Time interval onset of chest pain and ECG diagnosis of MI (n=600)**

Time interval onset of chest pain and ECG diagnosis of MI	Frequency & percentage
Less than 4 hours	108 (18%)
5-8 hours	288 (48%)
8-16 hours	204 (34%)
Total	600 (100%)

Mean time interval was 8 hours with standard deviation  $\pm$  2.71

**Table 2: Association of cardiogenic shock in time interval onset of chest pain and ECG diagnosis of MI (n=600)**

Cardiogenic shock	Less than 4 hours	5-8 Hours	9-16 Hours	Total
Yes	4	16	10	30
No	104	272	194	570
Total	108	288	204	600

Chi Square test was applied in which P value was 0.23

## DISCUSSION

The coronary heart disease varies from country to country<sup>6</sup>. affecting the majority of adults over the age of 60 years, but it is on rise in developing countries as well. The mean age of the patients in this study was 60  $\pm$  1.26 years as compared to 62  $\pm$  5 in COURAGE trial conducted in USA<sup>7</sup>.

In this study 41% patients were in age range 61-70 years followed by 33% patients were above 70 years of age similar results were found in study done by Saleheen D et al<sup>8</sup> in which 50% patients were in age range 61-70 years followed by 42% patients were above 70 years of age. More over in this study 68% patients were male while 32% patients were female. Similar results were quoted in study done by Saleheen D et al<sup>8</sup> in which 65% patients were male and 35% patients were female.

This signifies that Pakistani patients are relatively younger as compared to the West. Gender differences in coronary heart disease risk are also important<sup>9</sup>. Middle-aged men have a 2 to 5 times higher risk than women, but this risk ratio differs between populations<sup>10</sup>. This study shows that the incidence of cardiogenic shock in adults patients with non-ST elevation myocardial infarction was 5%. Among those 5% patient the most common age group was 50 years and above, similar results found in study done by Rosamond W et al<sup>11</sup> in which most of the patients with non ST elevation myocardial infarction were 6% in which most of the patients were above 50 years of age. In another study done by Jafary MH et al<sup>12</sup> the incidence of cardiogenic

shock in patients with non-ST elevation myocardial infarction was 5% in which most of the patients were above 50 years of age.

Our results shows that the incidence of cardiogenic shock in patients with non-ST elevation myocardial infarction is more in male patients as compare to female patients. More over most of the cases were recorded at 9-16 hours of onset time. Similar results were found in study done by Jafary MH et al<sup>12</sup> in which incidence of cardiogenic shock in non-ST elevation myocardial infarction was more in male as compared to female patients. More patients were recorded in on set time of 9-16 hours.

Similar findings were also observed other study done by Polonsk L et al<sup>13</sup> and Reynolds HR et al<sup>14</sup> in which the same concept was as explained as in the study done by Roynolds et al<sup>14</sup>. There was a clear male preponderance (68%), which is in agreement with previous studies, suggesting that it is predominantly a disease of men. Females represented only 22% of patients. Although this is a much higher frequency compared with data from India i.e. 5%. Most of the reported data show that smoking is the commonest risk factor encountered in patients with acute myocardial infarction. This study is not an exception, as smoking was indeed the leading risk factor present in 46% of the patients. The male preponderance and smoking being the major risk factors has been well documented in many local studies.

## CONCLUSION

Cardiogenic shock is a treatable illness with a reasonable chance for full recovery. An early invasive approach can increase short and long term survival and can result in excellenct quality of life.

## REFERENCES

1. Thygesen K, Alpert JS, White HD. Universal definition of myocardial infarction. *Eur. Heart J.* 2007; 28(20): 2525-38.
2. Valensi P, Lorgis L, Cottin Y. Prevalence, incidence, predictive factors and prognosis of silent myocardial infarction: a review of the literature. *Arch Cardiovasc Dis.* 2004; 104(3): 178-88.
3. Roe MT, Messenger JC, Weintraub WS. Treatments, trends, and outcomes of acute myocardial infarction and percutaneous coronary intervention. *J Am Coll Cardiol.* 2010; 56(4): 254-63.
4. O'Connor RE, Brady W, Brooks SC. Acute coronary syndromes: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation* 2010; 122(18): 787-97.
5. Van de Werf F, Bax J, Betriu A. Management of acute myocardial infarction in patients presenting with persistent ST-segment elevation: the Task Force on the Management of ST-Segment Elevation Acute Myocardial Infarction of the European Society of Cardiology". *Eur Heart J.* 2008; 29(23): 2909-45.
6. Andraws R, Berger JS, Brown DL. Effects of antibiotic therapy on outcomes of patients with coronary artery disease: a meta-analysis of randomized controlled trials. *JAMA.* 2005; 293(21): 2641-47.
7. Boden WE, O'rourke RA, Teo KK, Hartigan PM, Maron DJ, Kostuk W, et al. Design and rationale of the Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation (COURAGE) trial Veterans Affairs Cooperative Studies Program no. 424. *Am Heart J.* 2006 Jun; 151(6): 1173.
8. Saleheen D, Zaidi M, Rashid A, Ahmad U, Hakeem A, Murtaza M, et al. The Pakistan risk of myocardial infarction study:a resource for the sudy of genetic, lifestyle and other determinants of myocardial infarction in south asia. *Eur J Epedemiol.* 2009; 24: 329-38.
9. CDC - Heart Disease Fact Sheet - DHDSP. (n.d.). Centers for Disease Control and Prevention. Retrieved February 19, 2012. Available from URL:[http://www.cdc.gov/dhdsp/data\\_statistics/fact\\_sheets/fs\\_heart\\_disease.htm](http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_disease.htm).
10. Heart Disease. Retrieved March 3, 2012, from Centers for Disease Control and Prevention. Available from URL: <http://www.cdc.gov/nchs/fastats/heart.htm>.
11. Rosamond W, Flegal K, Furie K, Go A, greenlund K, Hasse N, et al. Heart disease and stroke statistics--2008 update: a report from the American Heart Association Statistics Committee and Stroke Statistics Subcommittee. *Circulation.* 2008; 117: 68-92.
12. Jafary MH, Samad A, Ishaq M, Jawaid SA, Ahmad M, vohra EA. Profile of acute myocardial infarction (AMI) in Pakistan. *Pak J Med.* 2007: 485-89.
13. Polonsk L, Gasior M, Gierlotka M, kalarus Z, Cielinski A, Dubiel SJ, et al. Polish registry of acute coronary syndromes (PL-ACS) characteristics, treatments and outcomes of patients with acute coronary syndromes in Poland. *Kardiol Pol.* 2007; 65: 861-72.
14. Reynolds HR, Hochman JS. Cardiogenic shock: current concepts and improving outcomes. *Circulation.* 2008; 117: 686-90.