

FREQUENCY OF CARIOGENIC SHOCK IN ACUTE INFERIOR WALL MYOCARDIAL INFARCTION

Muhammad Shahzad Azeem^{a*}, Asma Shareef^a, Muhammad Qasim Khan^a, Muhammad Waqas Ahmed^a

^aKing Edward Medical University, Lahore..

Date of Submission : 20-12-2021; Date of Acceptance: 29-12-2021; Date of Publication: 31-12-2021

ABSTRACT:

BACKGROUND: *Coronary heart disease (CHD) or atherosclerotic coronary artery disease has highest mortality rate United States and Worldwide. It is expected that the projected increase in coronary heart disease will be much higher in South Asia as compared to other regions worldwide. In South Asia, it is expected to more than double over the next 20 years.*

AIMS & OBJECTIVE: *The objective of the study was to determine the frequency of cardiogenic shock in acute inferior wall MI cases during hospital stay.*

MATERIAL & METHODS: *This descriptive case series involved 100 patients and was conducted at the Cardiology department of Mayo Hospital Lahore from Jan 2018 to –Dec 2018. Patient's age, gender and presence of cardiogenic shock was noted. Data was analyzed using SPSS.*

RESULTS: *Mean age was 56.24±9.38 years. 57% were male and 43% were females. Cardiogenic shock was seen in 28% of cases.*

CONCLUSION: *The frequency of cardiogenic shock is significant among patients with acute inferior wall MI cases during hospital stay. Therefore, it is recommended that every patient presenting with acute inferior wall MI, should be sort out for cardiogenic shock.*

KEY WORDS: *Acute inferior wall MI, hospital stay, cardiogenic shock, frequency*

Correspondence : Muhammad Shahzad Azeem, King Edward Medical University, Lahore. Email: shahzadazeem7@hotmail.com

Author's Contribution: MSA: Principal Investigator, manuscript writing, data collection. AS: Helped in conducting the study and done corrections in manuscript. MQK: Helped in manuscript writing. MWA: Helped in data collection.

INTRODUCTION:

Coronary heart disease (CHD) or atherosclerotic coronary artery disease has highest mortality rate United States and Worldwide¹. It is expected that the projected increase in coronary heart disease will be much higher in South Asia as compared to other regions worldwide. In South Asia, it is expected to more than double over the next 20 years². Compared to anterior wall MI, Inferior wall myocardial infarction (MI) is considered to be low risk. With the advent of thrombolytic therapy, the ranges of in-hospital mortality rate have reportedly dropped from 11% to 3.5%-9%.³

The leading cause of death with acute MI is Cardiogenic shock, with a frequency of around 7-10%⁴. Causes of hypotension among patients with inferior MI are severe RV infarction, bradyarrhythmias, acute severe mitral regurgitation, prior MI, left ventricle septal rupture and bezold-jarisch reflex.⁵ The characteristics of this low-output state are increased ventricular filling pressures, systemic hypotension, lowered cardiac output and proof of hypo-perfusion of vital organs. Despite the stable incidence of cardiogenic shock with STEMI since the mid-1970s, a decline from 70% to 80% in the 1970s to 50% to 60% in the 1990s, in short term mortality was recorded. In 60% of the patients who die with fibrinolysis STEMI, cardiogenic shock is the primary culprit⁶. To improve clinical outcomes, it may be helpful to do intensive therapy which includes the restoration of flow of blood in the right coronary artery especially the major RV branch⁷. The current study was planned to determine the frequency of cardiogenic shock in acute inferior wall MI cases during hospital stay.

MATERIAL AND METHODS:

This was a descriptive case series conducted at Cardiology department, Mayo Hospital Lahore from 1st Jan 2018 to 31st Dec 2018. After written

informed consent, 100 cases of 40 years and above of either gender with ECG finding of acute inferior wall MI presenting in emergency were assessed on ECG findings with no previous ECG changes. Patients with previous history of CAD with therapeutic coronary interventions, prior MI on ECG and non-cardiac causes of shock and patients with hemodynamic side effects of thrombolytic therapy were excluded from this study. Patient presenting in emergency with ST-Segment elevation of > 1mm in at least two of the inferior limbs leads, namely II, III, a VF were defined as Acute inferior wall myocardial infarction while cardiogenic shock was defined as systolic blood pressure measurement of <90 mmHg i.e. from the day of admission till discharge patient was observed for any hemodynamic changes. All patients were managed according to the standard protocol for MI management. Patients were followed for three-day hospital stay from the time of admission for the occurrence of cardiogenic shock. Statistical Package for Social Sciences (SPSS) version 10 was used to analyze the data. Categorical variables were expressed as frequency and percentages, while continuous variables like age were expressed as mean \pm standard deviation. Outcome variable i.e., cardiogenic shock was presented as percentage & frequency.

RESULTS:

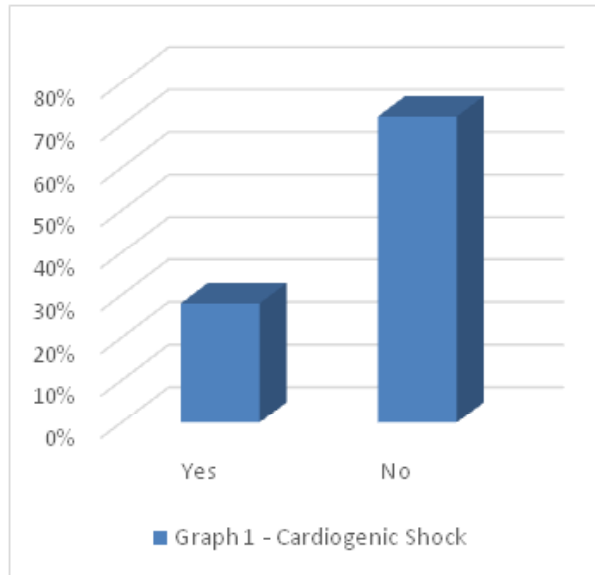
Total number of 100 patients were enrolled in the study. Mean age of patients was 56.24+9.38 years. There were 59% (n=59) patients between 40-60 years while 41% (n=41) patients were >60 years of age. There were 56% (n=56) males while 44% (n=44) were females (Table 1). Frequency of cardiogenic shock in acute inferior wall MI cases during hospital stay reveals in 28% (Figure 1). Stratification for cardiogenic shock according to gender shows that out of 28 cases of cardiogenic 19.6% (n=11) were males while 38.6% (n=17) were females (Table 2). So females are more

Table 1: Gender distribution of total study population

| | Total Number | Percentage (%) | Minimum Age (years) | Maximum Age (years) |
|--------|--------------|----------------|---------------------|---------------------|
| Male | 56 | 56% | 42 | 80 |
| Female | 44 | 44% | 40 | 74 |

Table 2: Frequency of Cardiogenic Shock in study population

| | Number (n) | Cardiogenic shock | Percentage (%) |
|----------------|------------|-------------------|----------------|
| Male | 56 | 11 | 19.6% |
| Female | 44 | 17 | 38.6% |
| Total patients | 100 | 28 | 28.0% |



commonly affected by cardiogenic shock.

DISCUSSION:

It is generally considered that inferior wall myocardial infarction has a more favorable prognosis as compared to anterior wall infarcts and account for 40-50%⁸ of all AMIs. This is supported by various trials, which show mortality rates ranging from 2%-9% in patients of Inferior MI's assigned to the control group aka "standard care"⁹. Cardiogenic shock (CS) is the leading cause of death for patients with acute myocardial infarction (MI) who reach the hospital alive.¹⁰

In our study, we recorded frequency of cardiogenic shock in acute inferior wall MI cases during hospital stay as 28%. Our findings are in agreement with a study by Malla et al, the frequency of cardiogenic shock in cases of inferior wall MI which was found to be 22.6% ($p = 0.05$).¹¹ Rodrigues and co-workers recorded that inferior wall infarction has less chances of shock than anterior and unless extensive

of right ventricle is also involved, on the other hand they are also of the view that hypotension as cold extremities and rapid pulse with blood pressure less than 100mmHg systolic was found in 20% of the cases.¹² Another study by Zahid Fida recorded the clinical complications in patients with acute inferior myocardial infarction and recorded 22.2% of the cases developed hypotension which is in agreement with our study.¹³

In elderly patients with inferior myocardial infarction Héctor Bueno and co-workers determined that these patients had a greater incidence of cardiogenic shock (independent of LVEF) - 32% vs 5%, intraventricular septal rupture - 9% vs 0%, and complete AV block - 33% vs 5%. They concluded that "patients with acute inferior myocardial infarction have a substantially increased risk of death during hospitalization when right ventricular involvement is present". The worse outcome is primarily due to the high incidence of cardiogenic shock and because its reversibility is infrequent.¹⁴

Considering the above facts, we determined cardiogenic shock in acute inferior wall MI cases during hospital stay is significant and needs to set new protocols for management of inferior wall MI keeping in view of cardiogenic shock as its most serious complication which may definitely help for improvement of the outcome among these patients.

Limitation of our study includes that our data is from one large setup our country which needs to be authenticated with some other multicenter trials.

CONCLUSION:

We concluded that the frequency of cardiogenic shock is significant among patients with acute inferior wall MI specially in females. So, it is recommended that every patient who present with acute inferior wall MI, should be sort out for cardiogenic shock.

References:

1. Bashore TB, Granger CB, Hranitzky P, Peter MR. Heart disease. In: McPhee SJ, Papadakis MA, editors. *Current medical diagnosis and treatment*. 49th ed. New York: McGrawHill; 2010:294-386
2. Saleheen D, Zaidi M, Rasheed A, Ahmad U, Hakeem A, Murtaza M. The Pakistan risk of myocardial infarction study: A resource for the study of genetic, lifestyle and other determinants of myocardial infarction in south Asia. *Eur J Epidemiol* 2009;24(6):329-38.
3. Jim MH, Chan AO, Tse HF, Lau CP. Predictors of in-hospital outcome after acute inferior wall myocardial infarction. *Singapore Med J* 2009;50(10):956-61
4. Menon V, Hochman JS. Management of cardiogenic shock complicating acute myocardial infarction. *Heart*. 2002; 88:531-7
5. Galla JM, Mukherjee D. Complications of myocardial infarction. In: Griffin BP, Topol EJ, editors. *Manual of cardiovascular medicine*. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2009:48-66.
6. Antman EM, Morrow DA. ST Segment elevation myocardial infarction. In: Libby P, O. Bonow R, L. Mann D, P. Zipes D, editors. *Braunwald's Heart Disease: A textbook of cardiovascular medicine*. 9th ed. Philadelphia: Saunders Elsevier; 2011:1111-71.
7. Assali AR, Teplitsky I, Ben-Dor I, Solodky A, Brosh D. Prognostic importance of right ventricular infarction in an acute myocardial infarction cohort referred for contemporary percutaneous reperfusion therapy. *Am Heart J* 2007; 153:231-7.
8. ISIS-2 (Second International Study of Infarct Survival) Collaborative Group: Randomized trial of intravenous streptokinase, oral aspirin, both or neither among 17,187 cases of suspected acute myocardial infarction: ISIS-2. *Lancet* 1988; 2:349-360
9. Kennedy JW, Martin GV, Davis KB, Maynard C, Stadius M, Sheehan FH, Ritchie JL: The Western Washington intravenous streptokinase in acute myocardial infarction randomized trial. *Circulation* 1988; 77:345-52
10. Goldberg RJ, Samad NA, Yarzebski J, et al. Temporal trends in cardiogenic shock complicating acute myocardial infarction. *N Engl J Med*. 1999; 340:1162-8.
11. Malla RR, Sayami A. In hospital complications and mortality of patients of inferior wall myocardial infarction with right ventricular infarction. *L Nepal Med Assoc* 2007;46(167):99-102.
12. Rodrigues A, Arujao D. Primary angioplasty for acute myocardial infarction complicated by cardiogenic shock on admission. *Rev Port Cardiol* 2000; 19:291.
13. Fida Z. Complications with acute inferior wall myocardial infarction. *JPMI* 2004; 18:202-5.
14. Bueno H, López-Palop R, Bermejo J, José L. López-Sendón, Juan L. In-Hospital Outcome of Elderly Patients with Acute Inferior Myocardial Infarction and Right Ventricular Involvement. *Circulation* 1997; 96:436-41