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ORIGINAL ARTICLE

In Hospital Outcomes of Cardiogenic Shock among Patients with Acute Myocardial Infarction

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ABSTRACT

Aim: To evaluate in-hospital cardiogenic shock (CS) outcomes after acute myocardial infarction.
Study Design: A descriptive study.
Place and Duration: InPunjab Institute of Cardiology, Lahorefor six-months duration from 18th June 2021 to 17th December 2021.
Materials and Methods: After meeting the inclusion criteria, 200 consecutive patients with cardiogenic shock afterwardsthe acute myocardial infarction were studied. The major group was Group I consisting of 105 (52.5%) subjects; these were CS patients with STEMI. The patients of group-IIcomprised of 80 (40%) subjects, these were cases with CS with Non-STEMI and patients of the group III were 15 (7.5%); with acute left bundle branch block (LBBB) in the CS setting.
Results: The mean age of the study people was 57.2 ± 29.40. The males in the studied people were 130 (65%), and women 70 (35%). In group I; 50 (47.6%) was the in-hospital mortality, group II has in-hospital mortality of 57 (71.3%) and in group III it was 7 (46.7%) cases.
Conclusions: Patients who developed cardiogenic shock afterwardsacute myocardial infarction have high ratio of mortality during their stay in hospital. This is because there are more risk factors in this subset of patients.
Keywords: acute myocardial infarction, cardiogenic shock, hospital mortality, left bundle branch block.

INTRODUCTION

Despite impressive advances and treatments in the past four eras, STEMI (STEMI) supposed to be a chief public problem for health in the industrialized world[1-2]. About one million patients each year in the United States suffer from acute myocardial infarction (AMI)[3-4]. Since 1960, STEMI-related mortality has been steadily declining across different population groups. Cardiogenic shock (CS) occurs when more than 40% of the heart muscle is irreversibly damaged (especially anterior wall infarction)[3-4]. About 80% of patients with cardiogenic shock have severe left ventricular dysfunction, 20% have mechanical defects such as ventricular septal defect, mitral regurgitation and electrical complications[5-6]. CS occurs in 8.6% of patients with STEMI. It occurs in 2% of patients without STEMI. In the absence of comprehensive intervention, overall hospital survival is 30% and mortality is 70%[7]. The rationale for the study is that CS patients constitute an important population group due to their poor prognosis and the availability of various treatments that can improve their survival. CS is accountable for the mainstream of deceases following AMI[8-9]. In the literature published in Pakistan, there is little data on the outcome of CS after AMI, so this study was intended to assess the outcome of Cardiogenic shock after AMI.

METHODS

This descriptive study was heldinPunjab Institute of Cardiology, Lahore for six-months duration from 18th June 2021 to 17th December 2021. After meeting the inclusion criteria, 200 consecutive patients, who developed CS after AMI, were analyzed. The major group was Group I consisting of 105 (52.5%) subjects; these were CS patients with STEMI. The patients of group-II comprised of 80 (40%) subjects, these were cases with CS with Non-STEMI and patients of the group III were 15 (7.5%); with acute left bundle branch block (LBBB) in the CS setting.All patients with cardiogenic shock who met the subsequent criteria of inclusion were registered in the analysis. 1) Patients with acute myocardial infarction diagnosed by any of the criteria listed below.

A Chest pain dependable with AMI. b) Electrocardiographic changes, i.e., ST-segment elevation ≥0.1 mV in at least 2 adjacent limb leads or ≥0.2 mV in at least 2 adjacent chest leads. c) New or possibly recent LBBB on electrocardiogram. d) Elevated cardiac enzymes.

2 Patients treated conservatively in wards. The exclusion criteria were CS occurring for reasons other than AMI. Patients with CS treated with interventional therapy were not included. Cardiogenic shock was definite as persistent hypotension (< 90 mmHg of systolic blood pressure) remains for> 30 mints with tissue hypoperfusion evidence (limbs colder than the core) at an appropriate LV filling pressure.

Data Collection and Follow Up: A complete medical history was collected, notably age, gender, smoking history, family history of ischemic heart disease, diabetes, ischemic heart disease and hypertension. Acute MI was defined according to WHO criteria and classified as associated or unrelated to ST elevation based on the absence or presence of ST elevation of minimum 1 mm in two or more contiguous leads on the first electrocardiogram. The location of acute MI has been classified as STEMI, non-STEMI, and acute LBBB. The time of first admission was definite as the arrival timein the hospital. Primary therapy of reperfusion was definite as the usage of fibrinolytic therapy given intravenously. The use of adjuvant therapy has been reported during hospitalization. The smoking status (current or non-smoker) was also specified. The mortality was categorized as in-hospital (death prior to discharge after admission to the intensive care unit). The standard treatment protocol was applied for all patient's treatment. Heart rate, blood pressure, fever, daily monitoring of patient respiratory rate; ECG changes were monitored for up to 04 days until the patient died or was discharged. All data was analyzed using SPSS (Statistical Package for Social Sciences) version 22.0 for Windows. The age of the patients is shown by calculating the mean and standard deviation. Gender and test results (heart rate, blood pressure, pyrexia, respiratory rate, ECG changes, thrombolysis) were expressed as the frequency distribution on days 1, 2, 3 and 4. At the end of day 4, survival and death were presented by calculating incidence and percentages and stratified by hypertension, diabetes, history of ischemic heart disease, smoking, family history of ischemic heart disease and dyslipidemia to address modifiers.

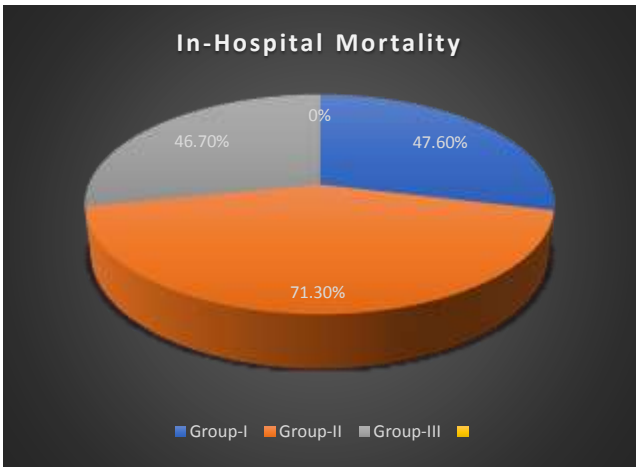
RESULTS

The mean age of the study people was 57.2 ± 29.40. The mean age of patients in group I was 49 ± 19.2 years, patients in group II 63.1 ± 21.4 years, patients in group III 68 ± 11.2 years.

Table-I: Clinical Presentations of the studiedPeople

Variables	Numbers (Percentages) n=200
CS+STEMI	100(52.5%)
CS+non-STEMI	85(40%)
CS+Acute LBBB	15(7.5%)

The males in the studied people were 130 (65%), and women 70 (35%). In group I; 50 (47.6%) was the in-hospital mortality, group II has in-hospital mortality of 57 (71.3%) and in group III it was 7 (46.7%) cases.



Group I 67 (63.8%) men and 38 (36.2%) women, group II 55 (68.8%) men and 25 (31.5%) women, group III 10 (66.7%) men and 5 (33.3%) women. (Table 2).

Table-II: shows Baseline Features of the studied People

Characteristics	Numbers (Percentages) n=230
Age	35-80Years
Sex Male Female	 130(65%) 70(35%)
DM	100(50%)
Hypertension	80(40%)
Smokers	125(62.5%)
Hyperlipidaemias	175(87.5%)
Previous H/O IHD	103(51.5%)

The diabetics in the studied people was 100 (50%), 37 (35.2%) in group I, 52 (65%) in group II and 11 (73.3%) in group III. The total hypertensive patients in the studied individualswere80 (40%). Of these, 28 (26.7%) belonged to group I, 47 (58.8%) to group II, and 5 (33.3%) to group III. 125 smoked (62.5%) in the study; In groups I63(60%), group II51(63.8%) and group III 11 (73.3%). Hyperlipidaemias was noticed in175 (87.5%), 100 (95.2%), 64 (80%) and 9 (60%) were in groups I, II and III, respectively. The family history of IHD was seen in 103 (51.5%) had previous history of IHD (Table 2).

Streptokinase therapy has been widely used in patients with acute STEMI and LBBB and has not been used in patients with non-STEMI. Inotropic support, diuretics and other necessary precautions were taken according to the protocol of the cardiology department.Overall, 114 (57%) patients in the study population died and 86 (43%) patients survived.In-hospital mortality predictors were reduced incidence, advanced age, very low blood pressure, high Killip, and extensive MI.

DISCUSSION

Coronary artery disease is the foremostreason of mortalityuniversally. CAD is estimated to affect 13.2 million Americans[10-11]. Not all people who have had a heart attack develop CS. In fact, CS develops in less than 10% of people who have had a heart attack[12]. But when it does, it is very dangerous. The most common cause of hospital death from a heart attack is CS. In our current study, we found CS to have poor outcome[13-14].AMI is the mainreason of bereavement in the recentera. CS most frequentlytranspires as animpediment of AMI[15]. Patients with CS have a higher risk of death and cardiovascular complications during AMI[16]. Patients with CS receiving inotropic support along with other necessary support measures have significantly higher mortality after AMI compared to other patients without CS. The observations in this report are dependable with formerlyprinted reports indicating amplified mortality from cardiogenic shock after acute myocardial infarction[17-18]. A study by Beattie et al shows that CS is the major reason of mortality in AMI70-90% of mortality. Previous studies have shown that progressive age, gender, diabetes mellitus and congestive heart failure are significantforecasters of endurance in cardiogenic shock patients with acute myocardial infarction[19-20]. We confirmed these observations and demonstrated an association of other conditions with survival. Conservative management is not enough to further reduce mortality[21]. In the past, almost no one has survived CS. Our outcomes also highpoint the necessity to recognise the causes of less hostiletreatment in these patients and to progress towardsbetter treatment approaches for acute myocardial infarction or better primary and secondary coronary protection[22]. Smoking, dyslipidemia, and obesity are important risk factors for STEMI. An anterior infarction is more common. Among diabetics, the likelihood of STEMI in men and women is almost equal, while the ratio of men to women in people without diabetes is 1: 6[23]. One currentresearchexhibited that amongst CS subjects who survived 30 days after STEMI, the yearly mortality rate was3-4% which wasalmost the similar as in patients without shock. More effective prevention of events of coronary syndrome may reduce the overall mortality burden of CS[24].

CONCLUSION

Patients who developed cardiogenic shock afterwards acute myocardial infarction have high ratio of mortality during their stay in hospital. This is because there are more risk factors in this subset of patients.

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