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Cardiogenic shock in patients with Acute Coronary Syndrome: a prospective observational study

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Abstract

Background and Aim: Several risk factors for the development of Cardiogenic shock (CS) have been identified - advanced age, prior history of MI, prior CABG, diabetes mellitus (DM), hypertension, anterior MI, left bundle branch block (LBBB) and multi-vessel disease. Present study was performed with following objectives: To study the clinical profile of patients with ACS complicated by cardiogenic shock, to assess the etiology of shock in patients presenting with STEMI and CS and to determine the clinical outcomes and in hospital mortality in Acute Coronary Syndrome **(**ACS) patients presenting with CS in a tertiary hospital.

Material and Methods: This is a prospective observational study of 110 patients conducted at U. N. Mehta Institute of Cardiology and Research Centre, Ahmedabad, Gujarat, India. Patients with ACS and CS and giving written consent for the study were included. A detailed history was taken, a thorough physical examination was done and a detailed 2-D echocardiogram was done in all patients. Various Variable such as Age, sex, history of coronary risk factors, type of STEMI, presence of conduction abnormalities, end-organ hypoperfusion, systolic and diastolic BP, heart rate, LVEF (by echo), clinical signs of pulmonary congestion and evidence on CXR, CK MB, troponin positivity, baseline renal, presence or absence of anemia, procedural characteristics such as percutaneous coronary intervention, number of stents, TIMI flow, culprit-vessel or multivessel PCI, use of IABP were studied.

Results: Chest pain or rest angina was the most common presenting symptom and was evident in 93 patients in STEMI group (95.9%) and eleven patients in NSTEMI group out of total thirteen

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patients. Conduction abnormality in the form of High grade AV block or Complete heart block was seen in sixteen (16.39%) patients of STEMI group with seven patients in anterior and nine inferior infarction. Mortality was seen in (41.53%) patients and major factor responsible was severe LV dysfunction and renal dysfunction. Out of 97 patients in STEMI group 55 (56.7%) patients were discharged and 42 (43.3%) patients died during hospital course.

Conclusion: The mortality rates of patients with ACS have reduced significantly over the last few decades. The mortality rate in patients with cardiogenic shock was 43.63%. Survivors tended to be younger than patients who died. There was no difference in the cardiovascular risk factors amongst patients who survived or died. Advanced age, occurrence of ventricular tachycardia, high grade A-V block lack of revascularization, high total leukocyte counts and renal dysfunction were associated with increased risk of mortality.

Key Words: Cardiogenic shock, end-organ hypoperfusion, Rest Angina, Ventricular Tachycardia

Introduction

Cardiogenic shock (CS) remains one of the most serious and challenging conditions in cardiology following acute myocardial acute coronary syndrome. Its incidence has remained constant for 20 years, and it continues to complicate between 5–8% of ST-elevation myocardial infarction (STEMI) and approximately 2.5% of non-ST-elevation myocardial infarction (NSTEMI) cases.[1,2]

The extent of ischemic myocardium has a profound impact on the initial, in hospital, and post-discharge management and prognosis of the cardiogenic shock patient. Careful risk assessment for each patient, based on clinical criteria, is mandatory, to decide appropriately regarding revascularization by primary percutaneous coronary intervention or coronary artery bypass grafting, drug treatment by inotropes and vasopressors, mechanical left ventricular support, additional intensive care treatment, triage among alternative hospital care levels, and allocation of clinical resources.[3]

The mortality of patients with AMI could be reduced from 30% to <5% for non-CS patients during the last decades, but, in the subgroup of patients with CS, improvements were much less impressive. Despite advances in treatment over the last decades, leading to a steady reduction in mortality, CS remains the leading cause of death, with hospital mortality rates still approaching 50%. Some recent registries suggested an increase in the CS setting despite an increase in invasive measures and revascularization rates, which may be related to the higher age and the higher risk profile of patients.[4]

Cardiogenic shock (CS) has been traditionally defined as a condition of end-organ hypoperfusion due to an impairment of cardiac function, in the presence of an adequate or raised intravascular filling volume. The criteria that have been conventionally used for the diagnosis of CS include end-organ hypoperfusion with persistent hypotension (systolic blood pressure [SBP] <80-90 mm Hg or mean arterial pressure 30 mm Hg less than the baseline) with a reduced cardiac index (<1.8 l/min/m^2 without support or <2.2 l/min/m^2 with support) and an adequate or elevated

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cardiac filling pressure (left ventricular end-diastolic pressure [LVEDP] >18 mm Hg or right ventricular end-diastolic pressure >10-15 mm Hg).[5]

Pump failure, secondary to an extensive myocardial infarction (MI), is the most common cause of cardiogenic shock in patients with acute coronary syndrome (ACS), accounting for nearly 80% of all cases. The other causes include mechanical complications such as contained free wall rupture with cardiac tamponade, ventricular septal rupture (VSR) and papillary muscle rupture leading to acute severe mitral regurgitation (MR). Right ventricular (RV) infarction, previously thought to be uncommon, is an important cause of shock in patients with inferior infarction. Several risk factors for the development of CS have been identified - advanced age, prior history of MI, prior CABG, diabetes mellitus (DM), hypertension, anterior MI, left bundle branch block (LBBB) and multi-vessel disease.[4]

Historically, older studies reported a mortality rate of 80-90% in patients with CS complicating MI. However, the current era of advanced medical care has witnessed a drastic reduction of the mortality rates to as low as 30-40%.[6,7] Old age, lower left-ventricular ejection fraction (LVEF), lower cardiac index, lower systolic blood pressure, need for vasopressor support, renal dysfunction, and high serum lactate levels are predictors of adverse prognosis in patients with CS.[8,9,10]

The SHOCK trial was a pivotal study that highlighted the importance of early revascularization in improving the long-term outcomes of patients with CS.[11,12] Although revascularization has been advocated irrespective of the time of symptom onset in patients with CS, the maximum benefit is accrued if reperfusion can be achieved early after symptom onset.[13]

The data of CS in ACS in the Indian population is limited. Our patients differ in profile significantly compared to the western population. The poor patient awareness and health care access further add to the problem. Hence, the results of the data from the western countries cannot be extrapolated to our patients. Accordingly, these studies was designed to assess the demographic profile of patients with CS following STEMI, assess the outcomes, and identifies the predictors of outcomes and to assess the role of novel biomarkers in a cohort of patients presenting to a tertiary care centre in India. Present study was performed with following objectives

1 To study the clinical profile of patients with ACS complicated by cardiogenic shock.
2 To assess the etiology of shock in patients presenting with STEMI and CS.
3 To determine the clinical outcomes and in hospital mortality in ACS patients presenting with CS in a tertiary hospital.

Material and Methods

This is a prospective observational study of 110 patients conducted between December, 2017 and January 2020 at U. N. Mehta Institute of Cardiology and Research Centre, Ahmedabad, Gujarat, India. The study was approved by the Institutional ethical committee.

Patients with ACS and CS and giving written consent for the study were included. A detailed history was taken, a thorough physical examination was done and a detailed 2-D echocardiogram

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was done in all patients. All these patients received guideline-directed medical therapy (GDMT) as determined by the treating cardiologist and hospital protocol.

Inclusion Criteria

Patients between 18-85 years of age with CS complicating STEMI with all of the below:

- Intended revascularization (PCI or CABG).
- Systolic blood pressure < 90 mm Hg for > 30 min or inotropes required to maintain systolic blood pressure > 90 mm Hg.
- Signs of pulmonary congestion.
- Signs of impaired organ perfusion with at least one of the following:
    - Altered mental status
    - Cold, clammy skin
    - Urine output <30 ml/h
    - Serum lactate >2mmol/l

Exclusion Criteria

(1) Patients with previous hypotension or shock, transient hypotension, or who required inotropes for a short period were excluded from the study.
(2) Patients with a severe systemic illness that could decrease short-term life expectancy.
(3) Cardiac arrest with resuscitation for more than 30 minutes were also excluded from the study.
(4) History of CVA in past 3 month

The following variables were studied:

Age, sex, history of coronary risk factors [including hypertension, diabetes, previous CABG or PCI, prior MI, smoking, peripheral artery disease, family history of CAD], type of STEMI, presence of conduction abnormalities, end-organ hypoperfusion (urine output and altered sensorium) as judged by the treating clinician, systolic and diastolic BP, heart rate, LVEF (by echo), clinical signs of pulmonary congestion and evidence on CXR, CK MB, troponin positivity, baseline renal, presence or absence of anemia (according to the WHO definition), other biomarkers such as CK-MB, troponin-I, angiographic characteristics such as number of vessels affected, presence of thrombotic occlusion, associated non-culprit vessel chronic total occlusion (CTO), procedural characteristics such as percutaneous coronary intervention, number of stents, TIMI flow, culprit-vessel or multivessel PCI, use of IABP .

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

Results

This study was initiated after due approval by the ethics committee of the U N MEHTA INSTITUTE OF CARDIOLOGY AND RESEARCH CENTRE), Ahmedabad. A total of one-hundred and Ten patients admitted to the CCU at our institute with shock were identified from

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December 2017 to January 2020. Informed consent was obtained from the patients and/or relatives of the patients included in the study. Previously, four studies from our institute, in patients with ACS and cardiogenic shock were done.

The minimum and maximum ages of patients in our study population were 28 and 80 years, respectively. The mean age of the subjects was 59.88 ± 11.80 years in STEMI and 63.77±7.82 years in NSTEMI groups. Thirty-four patients (30.90%) of the study population had a history of diabetes mellitus, with 33 had type -2 diabetes and there was one patient with a history of type 1 diabetes mellitus. Of the thirty-four patients, 13 (38.23%) had uncontrolled blood sugars at presentation, requiring treatment with high doses of subcutaneous/IV insulin. Thirty seven patients (33.63%) in the study population had a history of hypertension. Thirty-six patients (32.72%) were current smokers. Fourteen patients (12.72%) had a family history of CAD. Twenty-two patients (20.%) had a history of cardiovascular diseases. Of the twenty patients from STEMI group, three patients had a history of peripheral vascular disease, eight patients had a history of previous MI (two patients with inferior wall MI and six patients with anterior wall MI), four patients had a history of cerebrovascular accident (CVA) of more than three month duration and five patients had a history of previous PCI. From Two patients of NSTEMI group one had peripheral vascular disease and another had history of CVA. (Table 1)

Table 1: Baseline demographic characteristics of the study population (n=110)

Parameter		**STEMI with cardiogenic shock (n = 97)**	**NSTEMI with cardiogenic shock (n = 13)**
Age (years)		59.88±11.80	63.77 ± 7.82
Sex	Males (%)	60 (61.86%)	8 (61.5%)
	Females (%)	37 (38.14%)	5 (38.5%)
Diabetes Mellitus (%)		27 (27,8 %)	7 (53.8%)
Hypertension (%)		31 (31.96%)	6(46.2%)
Smoking (%)		31 (31.96 %)	5 (38.5%)
Family history of CAD (%)		13 (13.40 %)	1 (7.96%)
Prior history of CVD		20(20.6%)	2 (15.4%)
a-previous history of STEMI-		8	
b-previous h/o PCI		5	0
c-carebrovascular disease		4	0

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d-peripheral vascular disease	3	1 1

Clinical Presentation

Chest pain or rest angina was the most common presenting symptom and was evident in 93 patients in STEMI group (95.9%) and eleven patients in NSTEMI group out of total thirteen patients.

The most common presentation was with anterior with a cumulative incidence in Sixty three patients out of nighty seven patients in STEMI group (64.95%). The second most common presentation was inferior infarction in thirty three patients (34.02%). Six patients (6.18%) patients had right ventricular infarction with inferior wall infarction and Three (3.09%) had posterior wall infarction associated with inferior wall infarction which was suggested by elevation in V1 and RV dysfunction on 2D echo.

Table 2: Types of MI in study population (n=97)

Type of MI	Number (%)
AWMI	63 (64.95)
IWMI	34(35.05%)
IWMI+RVMI	06 (6.18%)
IWMI+PWMI	03 (3.09%)

In our study, fifteen patients (15.4%) had qRBBB on the ECG and all patients had anterior or anterolateral infarction. Conduction abnormality in the form of High grade AV block or Complete heart block was seen in sixteen (16.39%) patients of STEMI group with seven patients in anterior and nine inferior infarction. Two patient had high grade AV block and four patient had ventricular tachycardia. Twenty three patients (23.7%) patients in STEMI group had ventricular tachycardia during hospitalization which was a major predictor of mortality in these patients.

Thirty-two out of nighty seven patients (32.99 %) received fibrinolysis. Out of these, twnty eight patients (28.9%) were thrombolysed with streptokinase and Three patients (3.09%) with reteplase and one patient had received Tenecteplase outside our hospital. One patient had gastrointestinal bleeding and no patient had intracranial bleed. The other patients did not receive fibrinolysis because either most of the patients had undergone primary percutaneous intervention or they presented of the evolved myocardial infarction changes on ECG/ out window period for fibrinolysis Fourteen patients (43.75%) who received fibrinolysis had in-hospital mortality. (Table 3)

Table 3: Frequency of the different types of fibrinolytics used

Types of MI	Thrombolysed (N=32)
AWMI	23 (71.87%)

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IWMI	9 (28.12%)
IW+PWMI	01 (3.12%)
IW+RVMI	01 (3.12%)

Out of Ninety seven patients of STEMI, thirty two were thrombolysed of which seventeen had early presentation (53.12%) and fifteen patients had late presentation (46.87%). Out of this thirty two patients eighteen had undergone CAG in which most common pattern was SVD with culprit vessel showing thrombotic occlusion in most of the cases. Nine patients had undergone revascularization of which six (18.75%) had rescue PCI due to failed thrombolysis and three patient had elective PCI after medical stabilization (9.37%). Mortality was seen in fourteen (43.75%) patients mainly due to late presentation, failed thrombolysis and associated other organ dysfunction like renal failure.

Table 4: Outcome of STEMI patients with thrombolysis (n=32)

Characteristics	**FREQUENCY (%)**
Thrombolysed	32
Early Presentation (<12hrs) Late Presentation (>12hrs)	17 (53.12%) 15 (46.87%)
CAG	18(56.25%)
PCI Rescue Elective PCI	6(18.75%) 3(9.37%)
Mortality	14(43.75%)
Survival	18(56.5%)

Out of Ninety seven patients of STEMI sixty five patients were non thrombolysed of which thirty had early presentation (46.15%) and thirty five patients had late presentation (53.84%). Out of these sixty five patients fourty patients had undergone CAG in which most common pattern was SVD. Revascularization with PCI was done in twenty nine patients and only culprit vessel PCI was done. Mortality was seen in (41.53%) patients and major factor responsible was severe LV dysfunction and renal dysfunction (table-4).

Table 5: Outcome of STEMI patients with non thrombolysis (n=65)

Characteristics	**FREQUENCY (%)**
Non – Thrombolysed	65
Early Presentation (<12hrs) Late Presentation (>12hrs)	30 (46.15%) 35 (53.84%)
CAG	40(61.63%)
PCI	29(44.61%)
Mortality	27(41.53%)

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Survival	38(58.46%)

Table 6: Procedural characteristics of the patients who underwent CAG (n=60)

Variables	STEMI (N=97)
NO CAG	44 (45.4%)
Total no of CAG	53 (54.63%)
SVD	25 (47.16%)
DVD	12 (22.6%)
TVD	17 (32.07%)
LMCA	9 (16.98%)
LAD	43 (44.3%)
LCX	22 (22.7%)
RCA	35 (36.08%)
PCI PCI with stenting POBA only	38 (39.17%) 35 3
NO PCI	15 (28.30%)
Due to calcified vessel	2
Due critical osteal lesion	2
Associated multi organ dysfunction	9
Recanalised culprit vessel	1

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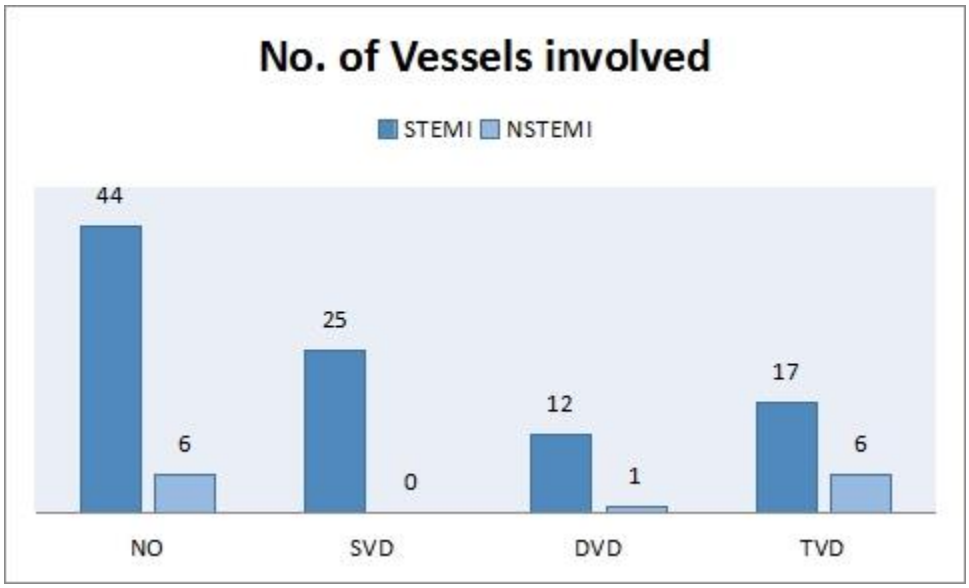

Figure 1: Procedural characteristics of the patients who underwent CAG

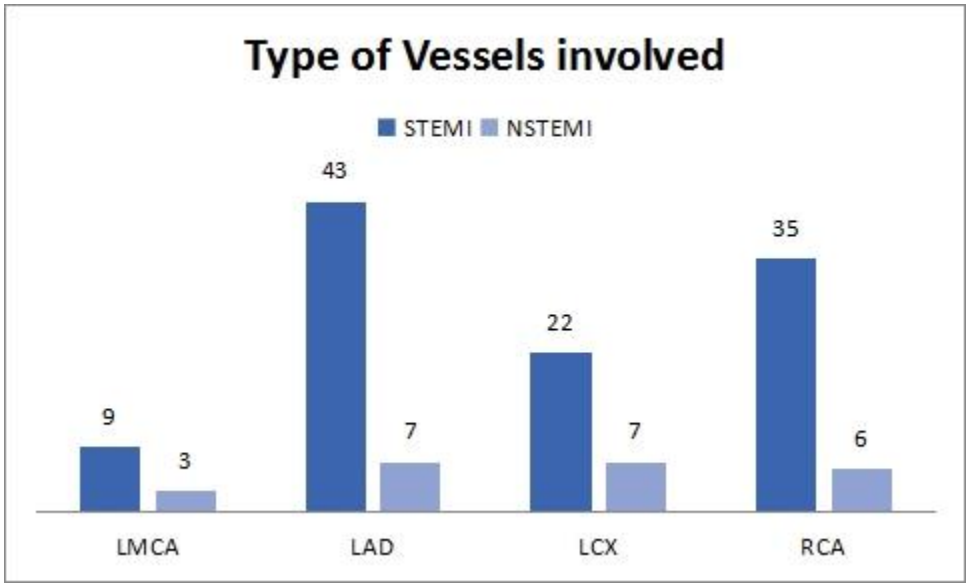

Figure 2: Type of vessel involved during CAG in study population

One patient developed free wall rupture and cardiac tamponade during the hospital stay and died before he could be taken up for surgery. Four patients (4.1%) had a ventricular septal rupture. Patient with cardiac perforation had AWMI and three out of four patients complicated by Apical VSR had AWMI with one patient had IWMI with Basal VSR. All of these patients were not thrombolysed as they were out of the window period. All the four patients with VSR died during hospitalization. Twenty four patients (25.8%) had moderate to severe MR most of these were having IWMI/PWMI which was also responsible for mortality in these patients. Twenty three patients (23.71%) in STEMI group of patients had ventricular tachycardia which was again a

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major cause for mortality in those patients. Many patients had renal dysfunction either at admission or during the course of their hospital stay which was also the leading cause of mortality in our study (Table 7).

Table 7: Complications during the hospital stay in the study population (STEMI n=97)

Complications in STEMI population	Frequency (%)
Ventricular septal rupture	4 (4.1%)
Ventricular tachycardia	23 (23.71%)
Renal dysfunction	36 (37.11%)
Chamber rupture	1 (1%)
AV block	16 (16.49%)
Moderate to severe MR	24(25.8%)

Out of 97 patients in STEMI group 55 (56.7%) patients were discharged and 42 (43.3%) patients died during hospital course. Of these 42 patients, 24 patients (24.74%) died within 24 hours of hospital admission and remaining 18 patients (18.56%) died after 24 hours of stay in STEMI group. In NSTEMI group 6 patients died out of 13 patients with 2 patients death occurred within 24 hours and remaining 4 died after 24 hours (Table 8)

Table 8: Outcomes in the study population(N=110)

Outcome	Number (percentage)
Survivors at hospital discharge	62 (56.36%)
Death within 24 hrs (STEMI)	24 (24.74%)
Death after 24 hrs (STEMI)	18 (18.56%)
Death within 24 hrs (NSTEMI)	02 (15.38%)
Death after 24 hrs (NSTEMI)	04(30.76%)

Discussion

This study was a non-randomized prospective observational cohort study aimed at identifying the risk factors in patients with ACS (STEMI and NSTEMI) and CS, identify the mechanisms of shock and the potential mortality predictors in the study cohort. This study included a total of 110 patients (of which 97 belongs to STEMI group and remaining 13 belongs to NSTEMI group) and CS who were admitted to the ICU at U N Mehta Institute cardiology and Research center, Ahmedabad from December 2017 to January 2020.

The mean age of presentation in our study was 59.88 ± 11.80 years in STEMI group and 66.73 ±7.82 years in NSTEMI group and most of our patients belonged to an age range of 45-65 years. This is in stark contrast to the much higher average age of presentation from the western data (66 years in the SHOCK trial and 68 years in the SHOCK registry). These results reflect the earlier onset and presentation of ACS in low and middle-income countries like India.[14,15,16]

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In contrast to previous study in which female sex was independent risk factor for mortality in our study, male sex was associated with a higher mortality rate, however, in view of low sample size, more number of male patients compare to females these results were not significant.[17] In NSTEMI group out total 13 patients eight were males and Five were female and there was no significant difference of mortality between males and females this could be attributed to very less number of patients in NSTEMI group.

Common risk factors for ACS include diabetes mellitus, hypertension, smoking, family history of CAD, obesity and dyslipidemia. Our data indicate a lesser prevalence of hypertension and diabetes compared to the SHOCK registry and SHOCK trial.[12,18] 20.6% of patients in our study had a history of previous CAD compared to 32% in the SHOCK trial.

The most common presentation of ACS was chest pain in STEMI group of patients (95.9%), and very few patients had presentation of gabharahaman/ diaphoresis and dyspnea. Majority of the patients had an anterior/anterolateral wall infarction (64.95%), while inferior wall infarction was seen in 25.77% of the patients and inferior wall along with right ventricular or posterior wall infarction was seen in 9.28 % of our patients. The type of infarction was not significantly different between the two groups. Our data is similar to the other studies of patients with CS, which have shown a higher prevalence of anterior or anterolateral infarction compared to inferior wall.[12]

The most common cause of CS in our study was left ventricular pump failure due to extensive MI, accounting for 46.36% of the cases, while posterior wall and right ventricular involvement accounted for 9.28 % of cases. Several other contributory factors included conduction abnormalities like complete heart block, high-grade AV block, ventricular arrhythmias, ventricular septal rupture, free wall rupture and severe mitral regurgitation. This is in contrast to the SHOCK trial where left ventricular pump failure accounted for shock in 78.5% of the patients.[19]

The mean left ventricular ejection fraction in our study was 32.91±6.92% in STEMI group and this was similar to the data from the SHOCK registry and in NSTEMI group the average EF was 32.31±9.49. The mean ejection fraction of survivor group was higher than the mortality group of STEMI population which was statistically significant and this findings was similar to the findings in SHOCK trial and registry[12,18] The sudden decrease in the LV systolic function without providing an adequate time for compensation and the associated systemic inflammation leads to shock even with an LVEF of 30%.20 In contrast, patients with ischemic and non-ischemic cardiomyopathy may remain stable for a long time with an LVEF of 30%.

In our study in STEMI group more than half of the patients presentation were late (more than 12 hours) so the median time from symptom onset to FMC was delayed. This delay is significantly higher compared to that in more advanced western countries with an average delay of fewer than 6 hours.[18]

In our study, in STEMI group of the patients mortality group had a higher prevalence of ventricular tachycardia (14 vs 9 patient) and the occurrence of CHB and high grade of A-V block was also higher in mortality group compared ti survival group, but both VT and A-V block did

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not show statistically significant different between the survivor and mortality group. In the survivor group, 13 patients (23.63%) had renal dysfunction at admission or during the course of hospitalization compare to quite higher number of patients with renal dysfunction i;e 25 in mortality group, but there was no statistically significant difference between two groups (p=0.09). The much higher prevalence of renal dysfunction in the mortality group though it was not statistically significant but had a significant impact on the mortality. Our study had included patients with end-organ dysfunction and renal dysfunction. In contrast, only around 5% of patients in the SHOCK trial had renal dysfunction.[12] Several studies have shown that the presence of renal dysfunction and the need for renal replacement therapy are important predictors of short term and long term mortality.[6,17]

In our study, single vessel disease (46.29%) was the most common finding and LAD was the most commonly affected vessel, followed by RCA and LCX. These findings correlate with the fact that anterior/anterolateral infarction is the most common in patients with CS. Double and triple vessel disease was found in 22.22% and 31.48% of patients, respectively. These findings are significantly different from the SHOCK trial, which reported a much higher prevalence of left main and triple-vessel disease.[12] The pattern of coronary artery involvement between survivors and mortality group was slightly different. SVD was more common compared to DVD and TVD pattern in survival group. In mortality group SVD pattern was seen in six numbers of patients compared to seven patients with TVD pattern. And this could be the factor responsible for lesser number of patients undergone PCI and also the factor for larger myocardium jeopardize and hence higher mortality.

VSR was seen in 4 patients (4.1) in our study. The prevalence of VSR in the SHOCK registry was 3.9%, which is similar to our data.17 All of these patients were not thrombolysed due to the late presentation. All the four died during hospitalization. Two patients had recurrent VT and remaining two patients had renal dyfunction along with severe LV dysfunction. The mortality rates in patients with mechanical complications, as cited by several reports, continues to be high. The mortality rate in SHOCK registry was 87.3%. The mortality rate in patients who are managed conservatively is estimated to be around 94%.[20] Previously, early surgical repair used to be the standard treatment for VSR. However, Sharma et al. in a recent review of eight patients, found that elective surgical repair after medical stabilization was associated with a very low mortality compared to early surgical repair.[21]

The mortality in our study was 43.53%, this is much lower than the 60% rate in the SHOCK registry and lower than 50-70% rates reported from Indian data.[18,22,23] The older studies reported a mortality rate as high as 80%.[3,83] The SHOCK trial reported a mortality rate of 46.7% in the revascularization group and 56% in the medical therapy group. The older studies of revascularization in CS showed a mortality rate of around 45%[24-27]

In our study in survival group in survival group renal dysfunction was seen in 13.04% patients and much higher number of patients had 25.77% had renal dysfunction. This higher percentage was one of the factor that precluded CAG and PCI in mortality group and hence also the major determinant of mortality. The predictors of mortality in our study are similar to that of BREMEN

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registry, the most recent data available on CS. The common predictors included advanced age and renal dysfunction.[28,29] The importance of renal dysfunction and age as mortality predictors were highlighted in other previou studies also.[30,31] Our study included patients with more comorbidities, late presentation, poor economic status, which is the current status in many countries around the globe. Our data paves the way for testing the approach of medical stabilization prior to elective coronary intervention for patients with a late presentation in developing countries.

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Conclusion

The mortality rates of patients with ACS have reduced significantly over the last few decades. However, the mortality rates remain high among patients with cardiogenic shock following

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myocardial infarction. The mortality rate in patients with cardiogenic shock was 43.63%. Survivors tended to be younger than patients who died. There was no difference in the cardiovascular risk factors amongst patients who survived or died. Anterior/anterolateral wall was the most common site of infarction in our study with the left anterior descending artery being the most common culprit vessel. There was a considerable delay in seeking medical attention and in receiving appropriate care. Late presentation of patients was major factor contributing the mortality and also this delay led to the increased occurrence of complications including end-organ dysfunction with acute kidney injury present in 39.09% in overall study population and 59.52% who died. Advanced age, occurrence of ventricular tachycardia, high grade A-V block lack of revascularization, high total leukocyte counts and renal dysfunction were associated with increased risk of mortality. Mechanical complication like Cardiac perforation and ventricular rupture seen in mortality group only and significant mitral regurgitation in seen in more number of patients in mortality group, all these complication significant impact on mortality in our study.