Original Article

To Determine the Percentage of Death or Survival of Patients Suffering from Post-Myocardial Infarction Ventricular Septal Rupture

% of Death or Survival from Post MI

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ABSTRACT

Objective: To determine the percentage of death or survival of patients suffering from post-myocardial infarction ventricular septal rupture.

Study Design: Descriptive study.

Place and Duration of Study: This study was conducted at the Emergency and Cardiology wards of the Idris Teaching Hospital / Sialkot Medical College Sialkot from Jan 2018 to June 2019.

Materials and Methods: A total of 45 diagnosed cases with post myocardial infarction ventricular sepal defect were selected for this study. All the patients were treated according to the treatment protocols of cardiology department. The outcome (death / survival) was studied during one week stay in the hospital.

Results: The mean age of the patients was 61.0±9.9 years. There were 21 (46.7%) male patients and 24 (53.3%) female patients. Eleven (24.4%) patients out of 45 were thrombolysis. In the distribution of patients by outcome, there were 21 (46.7%) patients who survived and remaining 24 (53.3%) patients died at the end one- week hospital stay.

Conclusion: This study demonstrates a high percentage of mortality in patients suffering from post-myocardial infarction ventricular sepal rupture during their one-week stay in the hospital. Old age and female gender carried a substantially increased risk of mortality in cardiac rupture.

Key Words: Myocardial infarction, ventricular sepal rupture, death or survival rate.

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INTRODUCTION

Despite revolutionary advancements in the diagnosis and management over the last few decades, acute myocardial infarction is still a major health problem all over the world.[1] Cardiogenic shock is the most severe clinical presentation of left ventricular failure (LVF) and is due to extensive damage to the left ventricular myocardium in more than 80% of ST-elevation myocardial infarction (STEMI) patients. The other 20% STEMI patients with LVF have a mechanical defect such as ventricular septal or papillary Muscle rupture or predominant right ventricular infarction.[2] Ventricular septal defect is rare but certainly life- threatening complication of acute ST elevation myocardial infarction.

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The thrombolytic therapy and primary percutaneous coronary intervention have reduced the incidence of post myocardial infarction ventricular septal defect (VSD). The size of VSD determines the magnitude of left to right shunt and extent of hemodynamic deterioration.[1,3] the incidence of VSD is higher (about 60%) in anterior myocardial infarction than in the inferior myocardial infarction (about 20-40%). VSD is usually associated with complete predictors of VSD are advanced age, female sex, anterior location of myocardial infarction and low body mass index (BMI).[2,3,4]

The management of post MI VSD is a great challenge for both the cardiologists and cardiac surgeons. The diagnosis of post MI VSD can be made easily with transthoracic echocardiography which has the sensitivity and specificity of about 100% in the diagnosis of post MI VSD. It carried a very high mortality rate either with or without surgical intervention. The mortality rate among patients with septal rupture who are treated conservatively is approximately 24% in the first 24 hours, 46% at one week and 67-82% at two months.[5] The early operative intervention is the treatment of choice according to the current guidelines of American College of Cardiology irrespective of clinical status of patient.[6] Recently

percutaneous VSD device closure has also been used to treat STEMI related septal rupture.[7]

In Pakistan the mortality of acute myocardial infarction has been studied previously but little data is available bout post MI VSD.[8,9]

The rationale of the study is to know the importance of management on the survival of patients suffering from post-MI VSD in a tertiary care hospital and it will guide the cardiologists for early referral of such king of patients to tertiary care hospitals to reduce mortality**.**

MATERIALS AND METHODS

This study was conducted at the Emergency and Cardiology wards of the Idris Teaching Hospital / Sialkot Medical College Sialkot from Jan 2018 to June 2019. A total of 45 diagnosed cases with post myocardial infarction ventricular septal defect admitted in Punjab Institute of Cardiology Lahore were selected for this study. An informed consent was taken from all the patients or their attendants. History of thrombolysis was taken from all the patients. All the patients were treated according to the treatment protocols of cardiology department. The outcome (death / survival) was studied during one week stay in the hospital. All the information was collected on the specially designed proforma.

All the data was entered into SPSS version 12 and analyzed accordingly. The qualitative variables like gender, survival/death was presented as frequencies and percentages. Quantitative variable like age was calculated as mean and standard deviation. Data was stratified for age, gender and thrombolytic therapy to address effect modifiers**.**

RESULTS

Forty-five cases with post myocardial infarction ventricular septal defect admitted of Idris Teaching Hospital Sialkot Medical College Sialkot was selected for this study. The mean age of the patients was 61.0±9.9 years. There were 2 (4.5%) patients in the age range of up to 40 years, 5 (11.1%) patients in the age range of 41-50 years, 14 (31.1%) patients in the age range of 51-60 years, 14 (31.1%) patients in the age range of 61-70 years and 10 (22.2%) patients in the age range of 71-80 years (Table 1).

Table No.1: Distribution of patients by age (n=45)

Age (Years)	No.	Percentage
Up to 40	2	4.5
41-50	5	11.1
51-60	14	31.1
61-70	14	31.1
71-80	10	22.2
Mean±SD	61.0±9.9	

There were 21 (46.7%) male patients and 24 (53.3%) female patients (Table 2). Only 11 (24.4%) patients out of 45 were thrombolysis and the remaining were not thrombolysis either due to late presentation or due to hemodynamic instability (Table 3). In the distribution of patients by outcome, there were 21 (46.7%) patients who survived and 24 (53.3%) patients died (Table 4).

Table No.2: Distribution of patients by sex (n=45)

Sex	No.	Percentage
Male	21	46.7
Female	24	53.3
Total	45	100.0

Table No.3: Distribution of patients by thrombolysis given (n=45)

Thrombolysis given	No.	Percentage
Yes	11	24.4
No	34	75.6
Total	45	100.0

Table No. 4: Distribution of patients by outcome (n=45)

Outcome	No.	Percentage
Survived	21	46.7
Died	24	53.3
Total	45	100.0

In the comparison of outcome with age, in the age group of up to 40 years, there was 1 (2.2%) patient who survived and 1 (2.2%) died, in the age group of 41-50 years, 4 (8.9%) patients were survived and 1 (2.2%) patient was died, in the age group of 51-60 years, 12 (26.7%) patients were survived and 2 (4.5%) patients were died, in the age range of 61-70 years, 4 (8.9%) patients were survived and 10 (22.2%) patients were died and in the age range of 71-80 years, all the 10 (22.2%) patients were died (Table 5). In the comparison of outcome with sex, in male patients, 12 (26.7%) patients were survived and 9 (20%) patients died and in female patients, there were 9 (20%) patients survived and 15 (33.3%) patients died (Table 6).

Table No. 5: Comparison of outcome with age(n=45)

Age (Years)	Died		Survived	
	No	Percentage	No.	Percentage
Up to 40	1	2.2	1	2.2
41-50	1	2.2	4	8.9
51-60	2	4.5	12	26.7
61-70	10	22.2	4	8.9
71-80	10	22.2	0	0
Total	24	53.3	21	46.7

Table No. 6: Comparison of outcome with sex (n=45)

Sex	Died		Survived	
	No	Percentage	No.	Percentage
Male	9	20.0	12	26.7
Female	15	33.3	9	20.0
Total	24	53.3	21	46.7

Table No. 7: Comparison of outcome with Thrombolysis given (n=45)

Thrombolysis given	Died		Survived	
	No	Percentage	No.	Percentage
Yes	8	17.8	3	6.7
No	16	35.5	18	40.0
Total	24	53.3	21	46.7

In the comparison of outcome with thrombolytic therapy, in those patients in whom thrombolytic therapy was given, 3 (6.6%) patients survived and 8 (17.8%) patients died. In those patients in whom thrombolytic therapy was not given, 18 (40%) patients were survived and 16 (35.5%) patients died (Table 7).

DISCUSSION

Rupture of the myocardium after acute myocardial infarction may involve the free wall of the left ventricle (LV), the interventricular septum, or the papillary muscles.[10] While LV free wall rupture and ventricular septal defect (VSD) are uncommon mechanical complications after AMI; they carry an extremely high mortality rate. The incidence, timing of occurrence, [11] prognostic factors, [12] and clinical features[13] and outcomes[14] of AMI complicated by VSD and LV free wall rupture in both the prethrombolytic and thrombolytic therapy eras have been debated extensive. However, there are no available data with regard to the incidence, clinical features, and outcomes of these complications in patients with AMI undergoing direct percutaneous coronary intervention (d-PCI). Furthermore, previous studies[15,] have demonstrated that although thrombolytic therapy can reduce the incidence of cardiac rupture, this therapeutic management for patients with AMI also may accelerate early cardiac rupture.[16,17] Whether this paradoxical effect of thrombolytic therapy also occurs in the present d-PCI reperfusion era remains unknown. Ventricular septal defect is rare but certainly life-threatening complication of acute ST elevation myocardial infarction. The thrombolytic therapy and primary percutaneous coronary intervention have reduced the incidence of post myocardial infarction ventricular septal defect (VSD). The size of VSD determines the magnitude of left to right shunt and extent of hemodynamic deterioration.[18]he incidence of VSD is higher (about 60%) in anterior myocardial infarction than in the inferior myocardial infarction (about 20-40%). VSD is usually associated with complete predictors of VSD are advanced age, female sex, anterior location of myocardial infarction and low body mass index (BMI).[19,20]The management of post MI VSD is a great challenge for both the cardiologists and cardiac surgeons. The diagnosis of post MI VSD can be made easily with transthoracic echocardiography which has the sensitivity and specificity of about 100% in the diagnosis of post MI VSD.[21] it carried a very high mortality rate either with or without surgical intervention. The mortality rate among patients with septal rupture who are treated conservatively is approximately 24% in the first 24 hours, 46% at one week and 67-82% at two months.[22] The early operative intervention is the treatment of choice according to the current guidelines of American College of Cardiology irrespective of clinical status of patient.[23] Recently percutaneous VSD device closure has also been used to treat STEMI related septal rupture.[24]

In our study the mean age of the patients was 61.0±9.9 years. As compared with the study of LA Rosa eT al[25] the mean age of the patients was 59.0±9.0 years, which is comparable with our study.

In our study 46.7% patients were male and 53.3% patients were female. While compared with the study of Choux eT al[26] there were 40% male and 60% female patients, which is comparable with our study.

In our study there were 24.4% patients, in which thrombolytic therapy was given and 75.6% patients in which thrombolytic therapy was not given.

In our study the patients of ventricular septal rupture who are treated conservatively according to the cardiology protocol, during their one week stay in hospital, 46.7% patients were survived and 53.3% patients were died. As compared with the study of Yip et al[5] among the patients with ventricular septal rupture treated conservatively during their one week stay in hospital, 54% patients were survived and 46% patients were died, which is comparable with our study.

In another study conducted by Poulsen et al[27] the patients of post myocardial infarction ventricular septal rupture treated conservatively during their stay in hospital, 48% patients were survived and 62% patients were died, which is also comparable with our study.

Ventricular septal defect is a serious complication of myocardial infarction, occurring in about 0.2% of cases. Untreated, mortality is high and early surgical repair is difficult because of friable necrotic tissue. Percutaneous closure may be an alternative treatment option in selected patients.

In a study conducted by Ahmad et al[10] the survival rate of post myocardial infarction ventricular septal defect was in 60% patients and death rate was in 40% patients. While in our study the patients of ventricular septal rupture survival rate was 46.7% patients and death rate was in 53.3% patients, which is comparable with the above study.

CONCLUSION

It is concluded from this study that there is high percentage of mortality in patients suffering from post-myocardial infarction ventricular septal defect during their one-week stay in the hospital. Old age and female gender carried a substantially increased risk of mortality in cardiac rupture and thrombolytic therapy has no beneficial effect on outcome.

Author's Contribution:

Concept & Design of Study:	Mansoor Hassan
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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