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Incidence of in Hospital Mortality in Patients of Acute ST Elevation Myocardial Infarction with Impaired Renal Function

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Abstract:
Introduction: *Ischemic heart disease (IHD) is a common cardiac disorder. It is a significant cause of mortality and morbidity worldwide. Effective risk stratification is integral to the management of patients with acute coronary syndromes and associated chronic kidney disease may adversely affect acute STEMI outcome.* ***Objective:*** *Main objective of this study is to evaluate the rate of in hospital mortality in patients of acute ST Elevation Myocardial Infarction with impaired renal function.* ***Method:*** *150 patients of STEMI diagnosed by clinical, biochemical and ECG criteria were included in the study.* ***Result:*** *After getting serum creatinine level, eFR was calculated and if it was<60ml/min then the patient was selected for the study. Hospital stay where Mean ± SD of hospital stay of the study patients was 5.51± 1.77 days. Among the 150 patients death occurred in 4% of cases.* ***Conclusion:*** *Renal impairment should be detected in early stage which is very necessary to avoid increased mortality.*

Key- Words*: Myocardial Infarction (MI), Renal Function, STEMI, Coronary heart disease (CHD)*

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I. Introduction

Myocardial infarction (MI) which is generally known as heart attack. It is caused by an acute blockage of one of the coronary arteries, usually due to coronary artery disease (CAD) also known as ischemic heart disease.When the coronary artery becomes obstructed, the heart muscle supplied by that artery immediately becomes severely ischemic (oxygen starved), and if the ischemia persists heart muscle cells begin to die. The death of heart muscle is what defines a heart attack. [1].The most common sign and symptom is the chest pain or discomfort which may travel into the shoulder, arm, back, neck, or jaw.

Coronary heart disease is a worldwide health epidemic. Worldwide 30 percent of all deaths can be attributed to cardiovascular disease of which more than half are caused by coronary heart disease. Globally 80 percent of people who are dying from cardiovascular disease are in developing countries .An American dies of coronary artery disease in every minute and about 38 percent of people experience an acute coronary event.

In 2001 it was estimated that worldwide coronary artery disease was responsible for 11.8 per cent of all death in countries from lower income background. Incidence of coronary artery disease in Bangladesh has increased from 3.3 per thousand to 14 per thousand from the year 1975 to 1985.

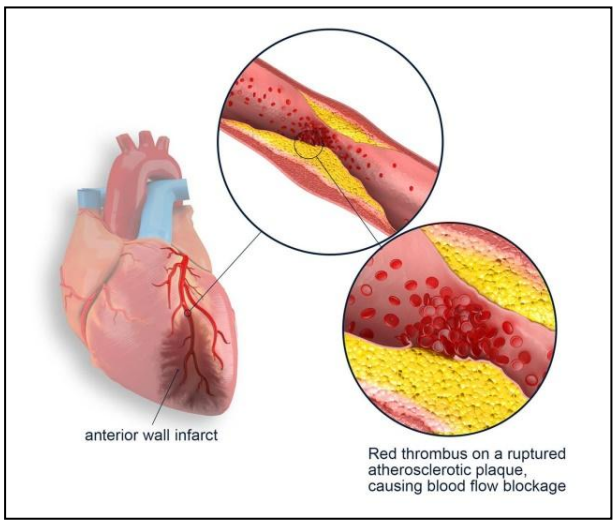

Figure: 01: Myocardial Infarction

Acute MI is a common presentation of acute coronary syndrome**.** All acute MI are classified as ST elevation and Non-ST-elevation MI. Acute STEMI is defined by at least two of the followings in which typical ECG changes is a must and any one either typical chest pain of cardiac origin or significantly raised troponin I level. ST-Elevation Myocardial Infarction (STEMI) is a very serious type of heart attack during which one of the heart's major arteries (one of the arteries that supplies oxygen and nutrient-rich blood to the heart muscle) is blocked[2]. The signs and symptoms of STEMI are chest pain or discomfort, shortness of breath, dizziness, nausea or vomiting, diaphoresis (sweatiness) and anxiety or a feeling of impending doom.Patients experiencing acute STEMI are at risk for developing life-threatening arrhythmias like ventricular fibrillation which causes sudden cardiac arrest, sometimes referred to as a "massive heart attack".

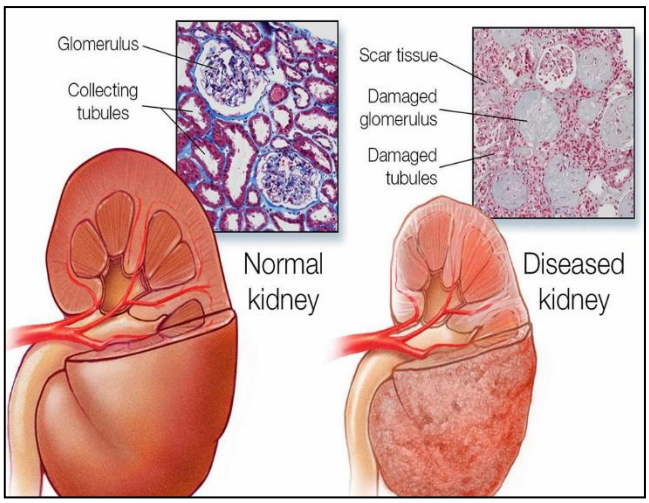

Figure: 02: Sequence of changes seen during evolution of myocardial infarction.

The utility of classifying myocardial infarction as ST-elevation MI and non-ST-elevation MI is on difference on management and prognosis. Most studies have demonstrated lower in hospital mortality in patients with non-ST-elevation MI.

Mortality in the short term in patients with STEMI remains remarkably high which is 12 percent in hospital mortality in the US National Registry of MI.

Smoking, male gender and a family history of cardiovascular and renal disease are associated with adverse prognosis in young patients with STEMI whereas dyslipidemia, hypertension and diabetes mellitus are associated with adverse prognosis in the elderly.

Impaired renal function is manifested by decreased GFR (*Glomerular filtration rate)*. Decreased GFR is measured by increased serum creatinine or more preciously by reduced creatinine clearance (<60ml/min). It is

an independent risk factor for CAD outcome. Mild renal impairment is associated with an increased risk of coronary artery disease and stroke, suggesting that cardiovascular disease may develop early in the course of renal dysfunction.

This study was to show the incidence of in- hospital mortality in patients of acute ST elevation myocardial infarction with impaired renal function.

II. Objective

The general Objective of the study is:

- To evaluate the rate of in hospital mortality in patients of acute ST Elevation Myocardial Infarction with impaired renal function.

The specific objectives are:

- To identify risk factors among the acute STEMI patients.
- To detect in hospital complications like heart failure, arrhythmias, cardiogenic shock sudden cardiac death.

III. Methodology

Table-1: Study type, place of study and duration

Study type	Study Place	Study Duration	Sample Technique	Sample Size
Prospective observational	Cardiology Department of Chittagong Medical College Hospital	01 Year	Purposive sampling	150

Table-2: Selection criteria

Inclusion criteria	Exclusion criteria
a) Patients of acute STEMI within twelve hours after the onset of chest pain who are eligible for thrombolysis. b) eGFR <60ml/min (Cockcroft-Gault formula) c) Voluntarily given consent to participate in the study	d) Non- STEMI e) Patients who are not eligible for thrombolysis f) STEMI with previous history of MI g) STEMI Patients with history vulvular heart disease, cardiomyopathy and h) congestive heart failure i) Patients with STEMI presenting with VT or VF

Table-3: List of variables

Demographic Variables	Clinical Variables	Cardiac variables
Age	Chest pain	Killip class
Sex	Shortness of breath	Symptom to needle time
BMI	DM	ECG
Occupation	HTN	Type of MI
Life style	Smoking history	Height of ST segment elevation
	History of Dyslipidemia	ST segment resolution
	Blood pressure	

Data analysis procedure:

- The following steps analyzed collected data,
- All relevant information for each individual study subject was recorded after getting informed written consent on a pre-formed data sheet.
- Collected data was checked repeatedly.
- Data was collected by the researcher himself.
- Then the collected data was entered into SPSS (Statistical Package for Social Science) computer software program.

IV. Results

Table 1 is showing age group distribution where among the 150 patients most of the patients were in age group 51-60 years (33%) next to which was 41-50 years (30%). The following table is given below:

Table 1: Distribution of age between the study groups (n = 150)

Age group	%
<40 yrs	16.0
41-50 yrs	30.0
51 – 60 yrs	33.0
61 – 70 yrs	21.0
> 70 yrs	0.0
Total	100

*** n= Total number of patients, %= Percent, <= Less than, >= Greater than, Yrs= Years

Figure 1 showing gender distribution where among 150 patients male was 75% and female was 25%. The following figure is give below:

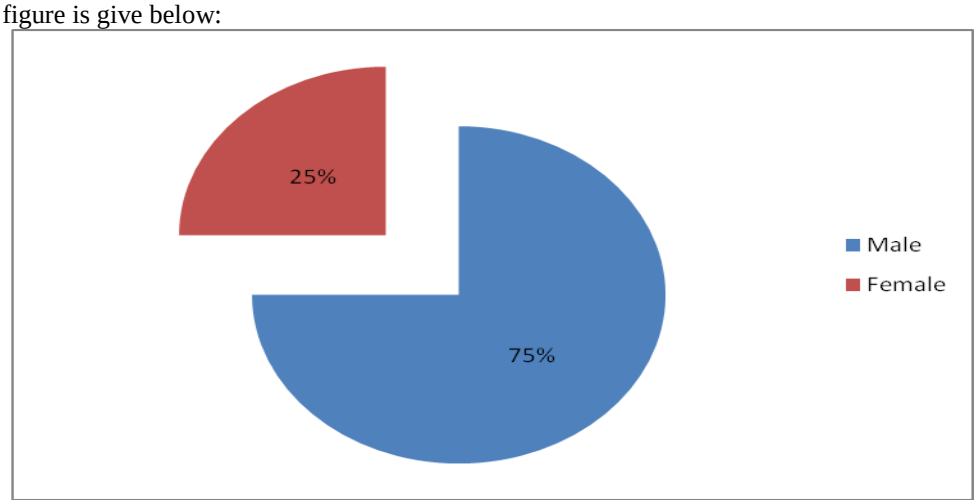

Fig 1: Distribution of sex (n=150)

Table 2 showing investigation findings where left ventricular ejection fraction was found in 50.82 ± 9.99% and random blood sugar was found in 222.82 ± 72.16 mg/dl. The following table is given below:

Table 6: Distribution of investigation findings (n = 150)

Investigations	**(n = 150)**
	Mean ± SD
LVEF (%)	50.82 ± 9.99
RBS (mg/dl)	222.82 ± 72.16
LDL C	210 ± 23.8
Serum creatinine	1.62 ± 0.37

Table 3 showing hospital stay where Mean ± SD of hospital stay of the study patients was 5.51± 1.77 days. The following table is given below.

Table 3: Hospital stay (n = 150)

Hospital Stay	**(n = 150)**
Mean ± SD	5.51 ± 1.77

Table-4 showing outcome of the study patients where among the 150 patients cardiogenic shock was found in 14% patients, heart failure was found in 21%, arrhythmias were found in 73% and death occurred in 4% of cases.

Table 4: Distribution of outcomes (n = 150)

outcomes		**%**
Cardiogenic Shock		14.0
Heart Failure		21.0
Arrhythmias	1. Tachyarrhythmias*	51.0
	1. Bradyarrhythmias**	22.0
Sudden cardiac arrest and death		4.0

V. Discussion

All over the worldCoronary artery thrombosis is the leading cause of Acute myocardial infarction (AMI) one of the major health problems[3]. Developing countries like Bangladeshas urbanization is taking place rapidly in, life style is changing which adversely affects the metabolism thereby causing a large increase in the number of diabetic patients [4].In this study, Male to female ratio was 3.34:1. The present results are inagreement that male population is more prone to STEMI which may be linked to genetic/ hormonal difference.

The present study showed among the 150 patients most of the patients were in age group 51-60 years (35%) next to which was 41-50 years (32%). Mean ± SD of age was 52.84 ±8.40 years. In a study done in Pakistan [5] it was found that the mean age was 55.69 ± 13.45. . It was found that patients with risk factors had below 40 age group which suggests that STEMI is now occurring in relatively young people in Bangladesh. In another study STEMI occurred in 26.5% cases in age less than 55 years, in 23.1% cases in age 55-64 years, in 27.7% cases in age 65-74 years, in 18.9% cases in age 75-84 years and 3.8% cases in age more than 85 years. Thus the results of the present study were consistent with the previous reports [6].

Regarding the evaluation of risk factors of STEMI hypertension was found in 61%, smoker was 52%, dyslipidemia was present in 78%, DM was in 31%, sedentary life style was found in 23% patients obesity was common among 23 % of total patients and family history of IHD was found in 24% of patients. The results of present study with reference to risk factors were similar to those published earlier that type 2 diabetic patients were more hypertensive than non-diabetic. 48% patients were found hypertensive in the diabetic group whereas only 36% patients were found hypertensive in non-diabetic group. All of the above findings are consistent with the earlier study [7].

Regarding analysis of complications and outcome Mean ± SD of hospital stay of the study patients was 5.51± 1.77 days. Left ventricular ejection fraction was found in 50.82 ± 9.99% and random blood sugar was found in 222.82 ± 72.16 mg/dl. Among the 150 patients cardiogenic shock was found in 14% patients, heart failure was found in 21%, arrhythmias were found in 73% and death occurred in 4% of cases. These findings are as expected from the patients with STEMI. In many study reported that patients with ACS, creatinine clearance is an important independent predictor of hospital death and major bleeding. [8]

VI. Conclusion

From the present study it can be concluded that impaired renal function among MI patients has an adverse outcome. Early detection of renal impairment is necessary to avoid increased mortality and morbidity. As renal impairment is associated with an increased risk of coronary artery disease and stroke, the cardiovascular disease may develop early in the course of renal dysfunction. In our country management facilities of complications of acute STEMI are limited.

- For further analysis need big sample and longterm duration.
- Early detection of renal impairment may help to avoid complications.

References

[1]. P. K. Mehta, J. Wei, and N. K. Wenger, "Ischemic heart disease in women: A focus on risk factors," *Trends Cardiovasc. Med.*, vol. 25, no. 2, pp. 140–151, 2015.

[2]. V. Hebbal, H. N. Setty, C. Sathvik, V. Patil, S. Sahoo, and C. Manjunath, "Acute ST-segment elevation myocardial infarction: The prognostic importance of lead augmented vector right and leads V_7 –V_9," *J. Nat. Sci. Biol. Med.*, vol. 8, no. 1, p. 104, 2017.

[3]. A. Ramachandran, C. Snehalatha, K. Satyavani, and V. Vijay, "Impaired fasting glucose and impaired glucose tolerance in urban population in India.," *Diabet Med*, vol. 20, no. 3, pp. 220–4, 2003.

[4]. M. A. R. Chowdhury, A. K. M. M. Hossain, S. R. Dey, A. K. M. Akhtaruzzaman, and N.-A.-F. Islam, "A comparative study on the effect of streptokinase between diabetic and non-diabetic myocardial infarction patients," Bangladesh J. Pharmacol., vol. 3, no. 1, pp. 1–7, 2008.

[5]. J. M. Boucher *et al.*, "Age-related differences in in-hospital mortality and the use of thrombolytic therapy for acute myocardial infarction.," *CMAJ*, vol. 164, no. 9, pp. 1285–90, 2001.

[6]. P. B. Richman, G. X. Brogan, A. N. Nashed, and H. C. Thode, "Clinical Characteristics of Diabetic vs Nondiabetic Patients Who "Rule-in" for Acute Myocardial Infarction," *Acad. Emerg. Med.*, vol. 6, no. 7, pp. 719–723, 1999.

[7]. V. Čulić, D. Mirić, and I. Jukić, "Acute myocardial infarction: Differing preinfarction and clinical features according to infarct site and gender," *Int. J. Cardiol.*, vol. 90, no. 2–3, pp. 189–196, 2003.

[8]. Santopinto, J. J., Keith AA Fox, Robert J. Goldberg, Andrzej Budaj, G. Pinero, A. Avezum, D. Gulba et al. "Creatinine clearance and adverse hospital outcomes in patients with acute coronary syndromes: findings from the global registry of acute coronary events (GRACE)." Heart 89, no. 9 (2003): 1003-1008.

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