

# The Pattern of Dyslipidemia in Patients of Acute Myocardial Infarction and Their Treatment Outcome in Bangladesh

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## ABSTRACT

**Background:** Dyslipidemia is one of the modifiable risk factors of acute myocardial infarction which is caused by presence of abnormal amount of lipid in blood.

**Objective:** In this study our main goal is to evaluate the pattern of dyslipidemia in patients of acute myocardial infarction and their treatment outcome in Bangladesh.

**Method:** This cross-sectional prospective observational type of study was conducted among 100 purposively selected patients of acute myocardial infarction attended in Cardiology Department of tertiary hospital, for treatment to see their pattern of dyslipidemia and treatment outcome during February 2016 to February 2017. Study subjects were selected from admitted patient at emergency department and at in-patient department of the Cardiology Department with acute coronary syndrome. Fasting lipid profile in next morning of admission was done and assessed. Dyslipidemia was considered according to ATP III guideline with Serum Total cholesterol > 200 mg/dl, TG>150 mg/dl, LDL >100 mg/dl, HDL. Collected information was checked repeatedly. Information was collected by the researchers. Data was processed and analyzed by using pc bases software system SPSS- 23 (Statistical Package for Social Science).

**Results:** During the study, male patients were 58% higher

than female and most of them belongs to 51-60 years age group (38%).75% patients had dyslipidaemia and after treatment 57% patients got discharged.

**Conclusion:** We can conclude that hypertriglyceridemia and hypercholesterolemia are the most prevalent dyslipidemia in patients of acute myocardial infarction in Bangladesh. Further research, in particular longitudinal studies, is needed for better outcome.

**Keywords:** Acute Myocardial Infarction, Dyslipidemia, Coronary Syndrome.

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## INTRODUCTION

Myocardial infarction (MI) is a common cardiac disease caused by occlusion of atherosclerotic blood vessels by thrombus which is composed of fibrin & platelets. Acute MI is a common presentation of acute coronary syndrome. In acute MI, most of the complications occur within few minutes to few days of initial attack. Nevertheless, some of these early complications are benign and some are life threatening.<sup>1</sup>

Acute MI are classified as ST elevation (STEMI) and Non-ST-elevation MI.<sup>2</sup> The utility classification of myocardial infarction as ST-elevation MI and non-ST elevation MI has difference on management and prognosis. Most of the studies demonstrated lower mortality patients in hospitals with non-ST-elevation MI.<sup>3</sup> However, mortality rate in the short term in patients with STEMI remain remarkably high, around 12% in hospital of US National

Registry.<sup>4</sup> Patients at high risk of developing STEMI face multiple coronary risk factors with unstable angina and rarely suffer hypercoagulability, collagen vascular disease, cocaine abuse, and intracardiac thrombi or masses.<sup>5</sup> Besides, the risk factors can play an important role in the STEMI developing patients. The effects of risk factors are found multiplicative rather than additive. People with a combination of risk factors (e.g. Dyslipidemia, smoking, hypertension and diabetes) are at greatest risk. Thus, assessment should be based on a holistic approach that takes account of all identifiable risk factors.<sup>6</sup>

Dyslipidemia is an abnormal amount of lipids (e.g. triglycerides, cholesterol and/or fat phospholipids) in the blood which act as a most common risk factor for CAD. In developed countries, most dyslipidemias are hyperlipidemias; that is, an elevation of lipids in

the blood. This is often due to diet and lifestyle. Prolonged elevation of insulin levels can also lead to dyslipidemia. Dyslipidemia is divided up into primary and secondary types. Primary dyslipidemia is inherited. Secondary dyslipidemia is an acquired condition. That means it develops from other causes, such as obesity or diabetes. Dyslipidemia is a primary, widely established as an independent major risk factor for coronary artery disease (CAD).

Coronary artery disease (CAD) particularly myocardial infarction secondary to atherosclerosis of coronary arteries remain the leading cause of morbidity and mortality worldwide. Atherosclerosis is a chronic, multifocal immuno-inflammatory; fibroproliferative disease of medium sized and large arteries mainly driven by lipid accumulation. Elevated levels of total and

low-density lipoprotein cholesterol (TC and LDL-C), elevated levels of triglycerides(TG) and low levels of high-density lipoprotein cholesterol (HDL-C) are important risk factors for CAD.LDL-C is considered as 'bad cholesterol' since too high level of this cholesterol is associated with an increased risk of coronary artery disease and stroke.

Dyslipidemia is a primary, widely established as an independent major risk factor for coronary artery disease (CAD) and may even be a prerequisite for CAD, occurring before other major risk factors come into play. Studies have reported higher prevalence of lipid abnormalities among Asians compared with non-Asians.<sup>7,8</sup> In this study our main objective is to evaluate pattern of dyslipidemia in patients of acute myocardial infarction and their treatment outcome in Bangladesh.

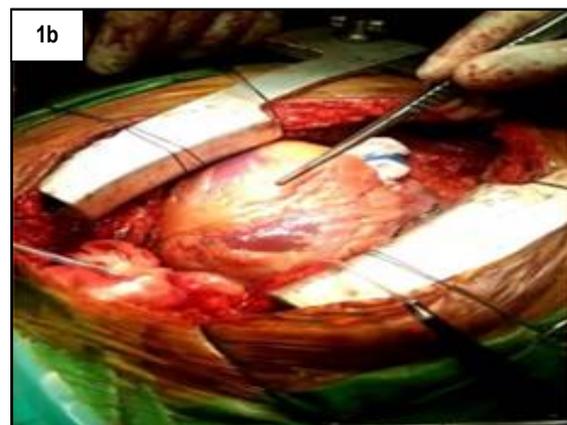
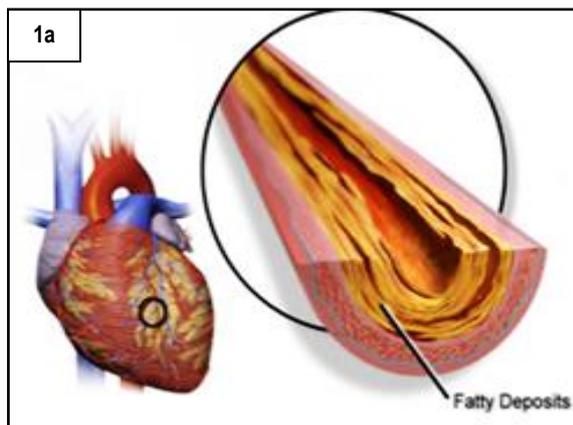


Figure 1a and 1b: Dyslipidemia- a dissected coronary artery in patient of acute myocardial infarction

**OBJECTIVES**

**General Objective**

- To assess pattern of dyslipidemia in patients of acute myocardial infarction and their treatment outcome in Bangladesh

**Specific Objectives**

- To identify types of myocardial infarction among the patients
- To detect lipid abnormalities in study patients.

**METHODOLOGY**

**Type of Study**

Cross-sectional prospective observational type of study.

**Place of Study**

Cardiology Department of tertiary hospital.

**Study Period**

1 year (February 2016 to February 2017)

**Study Population**

Patients of acute STEMI admitted in Cardiology Department.

**Sampling Technique**

Purposive

**Sample Size**

To analyze the result of test estimate was controlled by the accompanying equation:

$$n = \frac{Z^2 p q}{e^2}$$

Where,  
Z= 1.96;

p = 50%

= 0.50 (predicted percentage of Myocardial Infarction among the patients of impaired renal function)

Q = 1-p

= 0.50

e = 10%

$$\text{So, } n = \frac{(1.96)^2 \times 0.50 \times 0.50}{(0.1)^2}$$

= 96.4

= 100 (Apprx.)

**Study Procedure**

During the study period 100 consecutive patients, suffering from acute myocardial infarction were examined. Study subjects were collected from admitted patient from emergency department and also from in-patient department of the respective discipline with acute coronary syndrome. After that fasting lipid profile in next morning of admission was done and assessed the pattern and differences of all parameter of lipid in two types of MI. Dyslipidemia was considered according to ATP III guideline with Serum Total cholesterol > 200 mg/dl, TG>150 mg/dl, LDL >100 mg/dl, HDL < 40

**Data Collection Methods**

All relevant informations for every individual study subject were recorded after obtaining informed written consent on a pre-formed data sheet. Collected informations were checked repeatedly. Informations were collected by the research worker himself.

**Data Analysis**

Data was processed and analyzed by using pc bases software system SPSS-23 (Statistical Package for Social Science). Discrete or qualitative variables were analyzed by Chi-squared

test and continuous variables are going to be analyzed by T-test. P value will be considered as statistically vital once it is below 0.05.

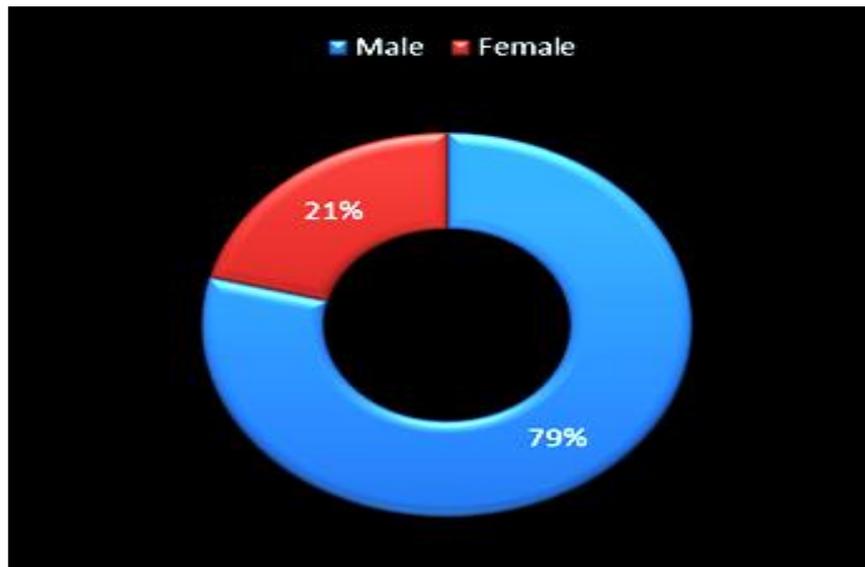


Figure 2: Gender distribution of the patients.

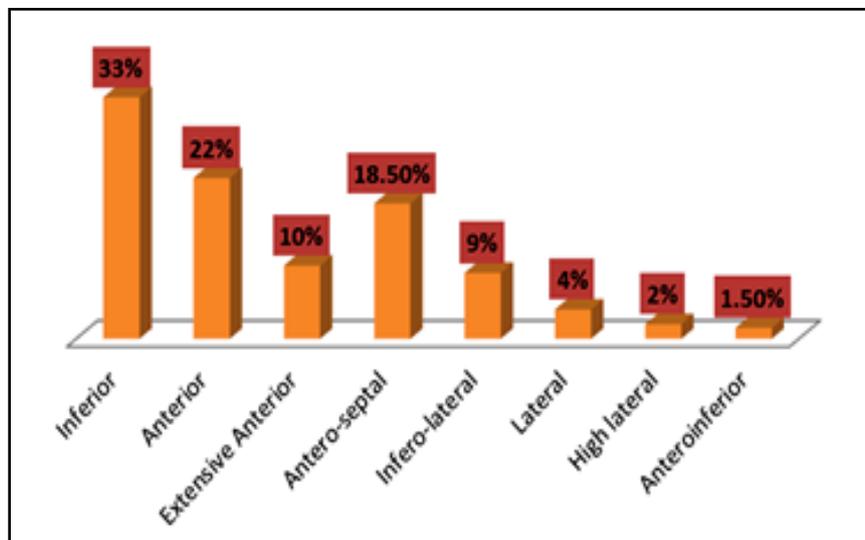


Figure 3: Distribution of types of myocardial infarction among the patients.

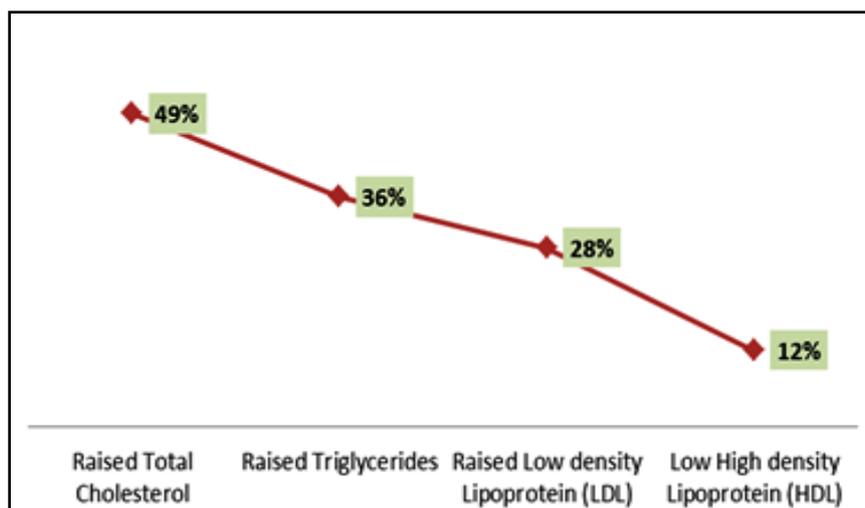


Figure 4: Lipid abnormalities in study patients.

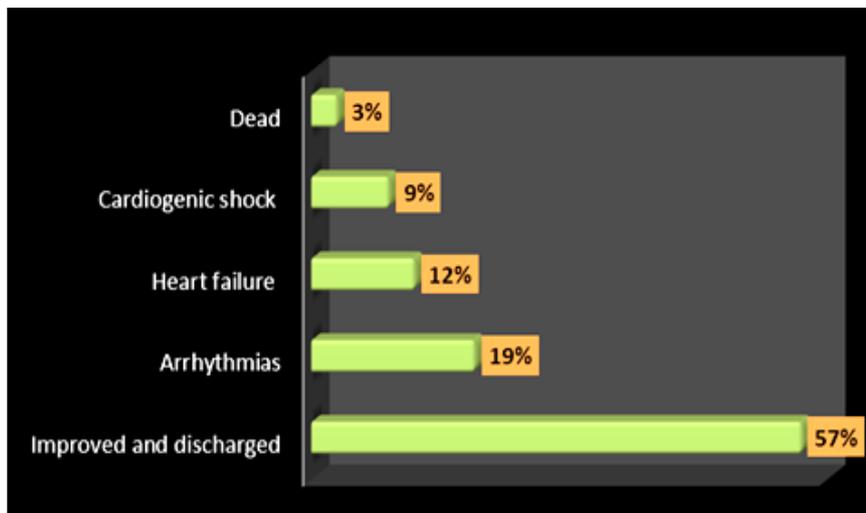


Figure 5: Treatment outcome of the patients

Table 1: Age group distribution of the patients

Age in Groups	(n = 100)
	%
<40 yrs	13%
41-50 yrs	28%
51 – 60 yrs	38%
61 – 70 yrs	20%
> 70 yrs	1%

Table 2: Distribution of risk factors for CHD in patients (n = 100)

Risk Factors	(n = 100)
	%
Smoking	53%
Hypertension	62.5%
Dyslipidemia	75%
Obesity	22%
DM	33%
Family history	25%
Sedentary life style	21%

Table 3: Distribution of patients according to examination findings

Clinical Examinations	n = 100
	Mean ± SD / n (%)
Heart Rate (per minute)	87 ± 15
Respiratory rate (bpm)	21 ± 7
Systolic BP (mmHg)	134.75 ± 19.25
Diastolic BP (mmHg)	87 ± 11.52
BMI (Kg/m <sup>2</sup> )	23.76 ± 2.51
Raised JVP	14%
Gallop rhythm	11%
Basal crepitation's	20%
LVEF (%)	52.82 ± 9.99
RBS (mg/dl)	223.81 ± 72.18
LDL C	213 ± 24.9

Table 4: Hospital stay (n = 100)

Hospital Stay	(n = 100)
Mean ± SD	5 ± 0.88

Table 5: Medical treatment commenced during hospital stay of the patients

Drug	%
Aspirin MD	96%
Clopidogrel (75 mg)	93%
Statins	92%
Aspirin LD (162-325 mg)	89%
Anticoagulant	85%
Beta blocker	83%
ACE inhibitor	81%
Clopidogrel (300 mg)	77%
Nitroglycerine	40%
Morphine	16%
Calcium channel blockers	8%

ACE: Angiotensin converting enzyme

**RESULTS**

Among the 100 patients most of the patients were in age group 51-60 years (38%) next to which was 41-50 years (32%). (table 1) In figure 2 shows gender distribution of the patients where male was 79% and female was 21%. Male patients were 58% higher than female. Table 2 shows risk factor analysis of the patients where dyslipidaemia were present in 75% patients.

In figure-3 shows distribution of types of myocardial infarction among the patients. Among 100 patients there were patients of inferior MI 33%, anterior MI 22%, extensive anterior MI 10%, anteroseptal MI 18.5%, Inferolateral MI 9%, lateral MI 4%, high lateral MI 2% and anteroinferior 1.5%. Mean ± SD of systolic blood pressure was found 136.75 ± 19.25 and random blood sugar was found in 222.82 ± 72.16 mg/dl as well as gallop rhythm was found in 10% patients, those are remarkable. (table 3) Figure 4 shows the lipid abnormalities of study patients where raised cholesterol highest 49% followed by raised triglycerides (36%), raised LDL (28%) and low HDL (12%).

In table 4 shows hospital stay of the patients where mean ± SD of hospital stay of the study patients was 5 ± 0.88 days. In table 5 shows medical treatment commenced during hospital stay of the patients where Aspirin LD (162-325mg) and Aspirin MD were used in 89% and 96% patients.

In figure 5 shows treatment outcome of the patients. 57% patients got improved with better outcome and discharged after treatment.

## DISCUSSION

The study was conducted among 100 patients and most of STEMI patients were found between 51 to 60 years (38% of the total patients), followed by 41-50 years (28%) and 61-70 years (20%). In another study STEMI occurred in 26.5% cases in age less than 55 years, in 23.1% cases in age 55-64 years, and in 27.7% cases in age 65-74 years. Therefore, the results of the present study were consistent with the previous reports. The mean  $\pm$  SD of age was 52.84  $\pm$  8.40 years, similar to another study done in Pakistan where the mean age was 55.69  $\pm$  13.45.

Among the 100 patients, 79% were male and 21 % were female, which reports that ischemic heart disease has a higher prevalence in male than female, suggested in a study from England.<sup>9-11</sup> Thus the present results are in agreement that male population is more prone to STEMI linked to any genetic or hormonal differences. Finally, the present study found that the STEMI occurrence after the age of 40 in Bangladesh.

Regarding the evaluation of risk factors of STEMI, dyslipidaemia was present in 75%, hypertension was found in 62.5%, smoker was 53%, DM was found in 33%. The results of present study with reference to risk factors were similar to previous published papers.<sup>12</sup>

In this study we found that 48% patients have hypertriglyceridemia followed by hypercholesterolemia (32%), raised LDL (28%) and low HDL (12%). These results are very much similar to the findings of one report where they had found hypertriglyceridemia as most common lipid abnormality in patients with dyslipidemia as it was found in 68.1% patients; followed by raised serum VLDL, hyper-cholesterolemia, raised serum LDL and low serum HDL found in 53.2%, 34.0%, 8.5% and 4.3% patients respectively.

Another study conducted in patients with acute myocardial infarction from two tertiary care hospitals in Pakistan reported that frequencies of hyper-cholesterolemia, hypertriglyceridemia, low high density lipoprotein cholesterol and isolated low high density lipoprotein cholesterol were found to be 30.6%, 30.1%, 48.6% and 34.1% respectively. In standard individuals from different communities, plasma levels of lipids vary due to differences in genetic background and diet.<sup>13</sup>

During the study Aspirin LD (162-325 mg) and Aspirin MD were used in 89% and 96% patients. Also we found only 4% died during the treatment. Which was supported by one study.<sup>14</sup>

## CONCLUSION

From our study, it is concluded that hypertriglyceridemia and hypercholesterolemia are the most prevalent dyslipidemia or lipid disorders in patients of acute myocardial infarction in Bangladesh. We should recommend paying more attention to serum lipids for prevention for acute myocardial infarction. Further research, in particular longitudinal studies, is needed to explore the complex interaction of these factors and to inform policies and programs for the prevention and management of CVDs in Bangladesh.

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