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CLINICAL OUTCOME AND RISK FACTORS OF PATIENTS WITH ACUTE MYOCARDIAL INFARCTION: A TERTIARY LEVEL HOSPITAL-BASED STUDY IN BANGLADESH.

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Introduction: Coronary Artery Disease (CAD) remains the major cause of mortality and morbidity in mankind. Even though a lot of advances are made in the diagnosis, management, and prevention of the disease. Coronary Artery Disease (CAD) is the leading cause of death in the United States, affecting over 5 million Americans. It is the most common cause of death worldwide.
Aim of the study: The study aimed to evaluate the clinical outcome and Risk Factors of Patients with Acute Myocardial Infarction in a Tertiary Level Hospital-Based Study in Bangladesh.
Methods: This cross-sectional study was conducted in the Department of Cardiology, TMC & RCH, Bogura, Bangladesh from January 2020 to January 2021. The study was conducted after obtaining ethical clearance from the institutional review board of TMC & RCH, Bogura, Bangladesh. The data was collected from the discharge records of the patients admitted to the cardiology department.
Result: A total of 56 patients were diagnosed with myocardial infarction and analyzed in this study. The age distribution of the study

was based on STEMI, 22(39.39%) patients suffering from AMI were in the 50-59 years' age group, 16(28.57%) patients were from the age group 60-69, 12(21.43%) patients were from the age group 40-49, among the 5(8.93%) patients were from the age group >70 age group and only one patient was from the age group 30-39. the clinical outcomes of the study population; there are 17(30.36%) patients who had a cardiogenic shock, 13(23.21%) patients who were getting well, 12(21.43%) patients who had LVF/Pulmonary edema, 7(12.50%) patients had bradyarrhythmias and both 7(12.50%) patients died within 24 hours of hospital admission, 5(8.93%) patients have had tachyarrhythmias, 4(7.14%) patients had a cardiac arrest and only one patient had a mechanical complication.

Conclusion: There is a need for early detection of risk factors to prevent the progression of coronary heart disease, a need for creating awareness in the community regarding risk factors, symptoms, and signs of acute myocardial infarction so that early referral can be done to the coronary care unit to prevent morbidity and mortality in the community.

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INTRODUCTION

Acute myocardial infarction (AMI) is one of the major health problems in the world. It is a common non-communicable disease prevailing in developed as well as developing countries. The incidence of AMI is increasing day by day. A definitive diagnosis of acute myocardial infarction requires characteristic clinical features, ECG findings, and a significantly raised Troponin I level. Cardiovascular diseases are the number one cause of death globally. [1] The majority of the deaths due to cardiovascular diseases are due to coronary heart disease. [1, 2] cardiovascular diseases have emerged as a major health burden in developing countries. [3-5] The South Asian countries of Bangladesh, India, Nepal, Pakistan, and Srilanka contribute to the highest proportion of the burden of cardiovascular disease. The early age of onset of cardiovascular disease in these populations is increasing the disease burden further. [4, 6] Deaths due to cardiovascular disease tend to occur 10 or more years earlier in these countries than they do in western countries. [5] Acute Myocardial infarction (AMI) is defined as the demonstration of myocardial cell necrosis due to significant and sustained ischemia. AMI is one of the five main manifestations of coronary heart disease, namely stable angina pectoris, unstable angina pectoris, AMI, heart failure, and sudden death. [7] In Bangladesh, advanced treatment of AMI (different thrombolytic therapies and PCI) is not available in every health care facility, even in all tertiary care hospitals. So due to delay in diagnosis and lack of availability of appropriate treatment various complications, develop and patients may die. Numerous studies were done in our country as well as abroad show that various complications may arise after an acute MI such as left ventricular failure, carcinogenic shock, heart block arrhythmia, cardiac rupture, and pericarditis. [8-10] The data regarding clinical characteristics and outcomes of AMI is lacking in Bangladesh. The study aimed to evaluate the clinical outcome and Risk Factors of Patients with Acute Myocardial Infarction in a Tertiary Level Hospital-Based Study in Bangladesh.

METHODOLOGY & MATERIALS

This cross-sectional study was conducted in the Department of Cardiology, TMC & RCH, Bogura, Bangladesh from January 2020 to January 2021. The study was conducted after obtaining ethical clearance from the institutional review board of TMC & RCH, Bogura, Bangladesh. The data was collected from the discharge records of the patients admitted to the cardiology department.

- **Inclusion criteria**:
  - The patient with a diagnosis of AMI was included in the study.
- **Exclusion criteria**:
  - Those patients with the presence of AV or intraventricular conduction disturbances existing before MI, or with cardiomyopathy, congenital heart disease, rheumatic heart disease, right ventricular hypertrophy, those patients on permanent pacemaker (PPM), those on drugs like verapamil or beta-blockers and the patients who did not consent for the study were excluded.

According to their affinity, all data were presented in a suitable table or graph. A description of each table and graph was given to understand them clearly. All statistical analysis was performed using the statistical package for social science (SPSS) program, and Windows. Continuous parameters were expressed as mean ±SD and categorical parameters as frequency and percentage. Comparisons between groups (continuous parameters) were done by Student's t-test. Categorical parameters compared by Chi-Square test. The significance of the results as determined by a 95.0% confidence interval and a value of $P<0.05$ was considered to be statistically significant.

RESULT

This is a cross selection study, a total of 56 patients were diagnosed with myocardial infarction and analyzed in this study. Figure-1 shows the age distribution of the study based on STEMI, 22(39.39%) patients suffering from AMI were in the 50-59 years age group, 16(28.57%) patients were from the age group 60-69, 12(21.43%) patients were from the age group 40-49, among the 5(8.93%) patients were from the age group >70 age group and only one patient was from the age group 30-39. The gender distribution of the study is shown in Figure-2; there are 39(69.65%) male and 30(30.35%) female. In this study, there are 40(71.43%) patients from the upper class, 11(19.64%) patients were the middle class and only 5(8.93%) patients from the lower class (Table-1). Figure-3 shows the most relevant cardiovascular risk factors of this study, 21(37.50%) patients were smokers, 18(32.14%) patients had diabetes, 17(30.36%) patients had an HTN problem, 12(21.43%) patients had dyslipidemia and 9(16.07%) patients had an issue of F/H of IHD. Table-2 shows the clinical outcomes of the study population; there are 17(30.36%) patients had a cardiogenic shock, 13(23.21%) patients were get well, 12(21.43%) patients had LVF/Pulmonary edema, 7(12.50%) patients had bradyarrhythmias both 7(12.50%) patients died within 24 hours of hospital admission, 5(8.93%) patients were had tachyarrhythmias, 4(7.14%) patients had a cardiac arrest and only one patient had a mechanical complication.

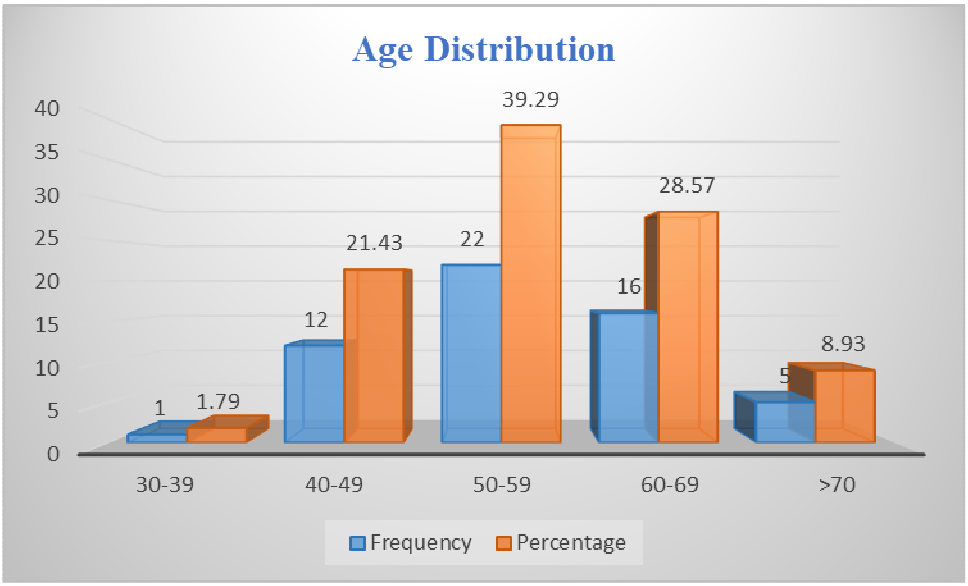

Figure-1: Age distribution of the study population based on STEMI (N=56)

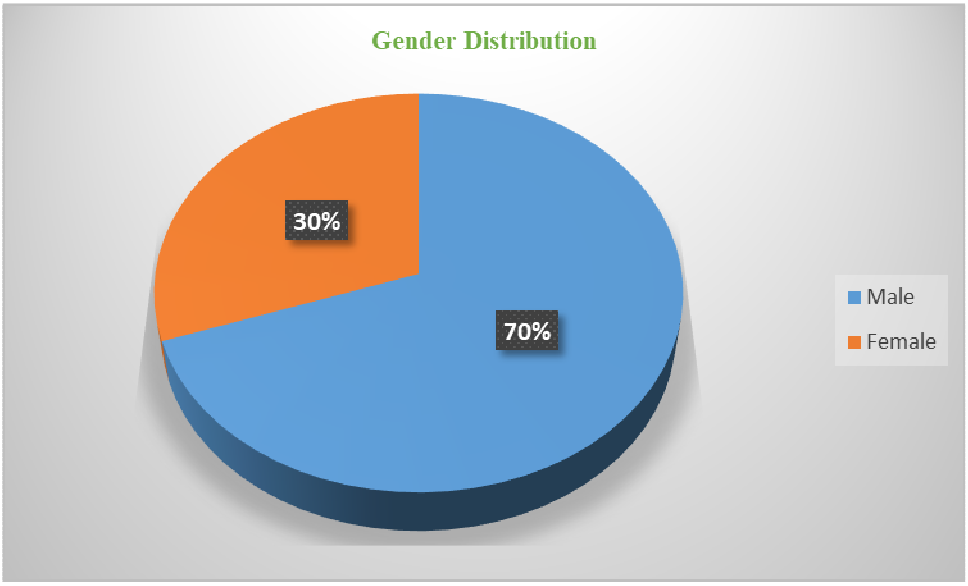

Figure-2: Gender distribution of the study population (N=56)

Table-1: Socio-economical condition of the study population (N=56)

Socio-economical condition	Frequency	Percentage
Lower	5	8.93
Middle	11	19.64
Upper	40	71.43

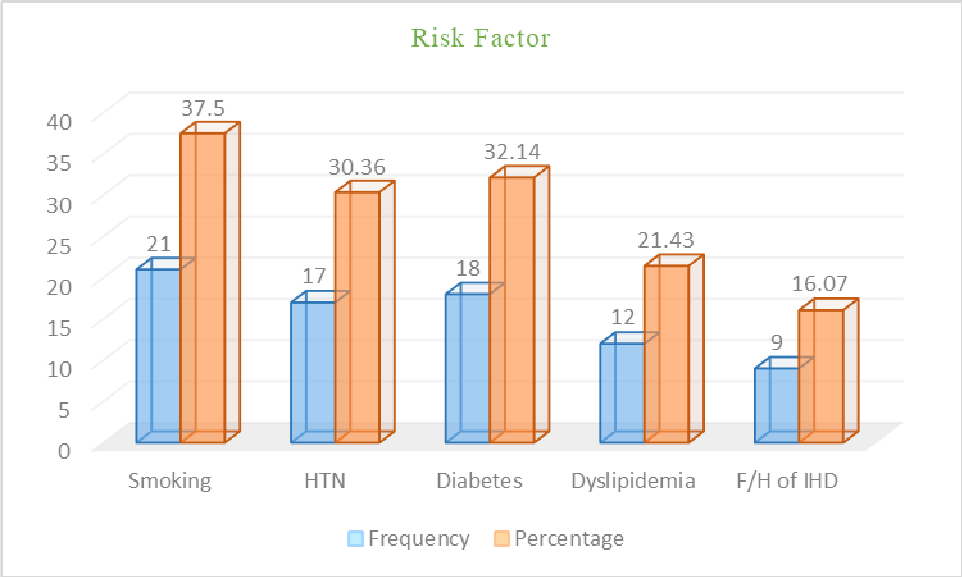

Figure-3: Cardiovascular risk factors of the study patients (N=56)

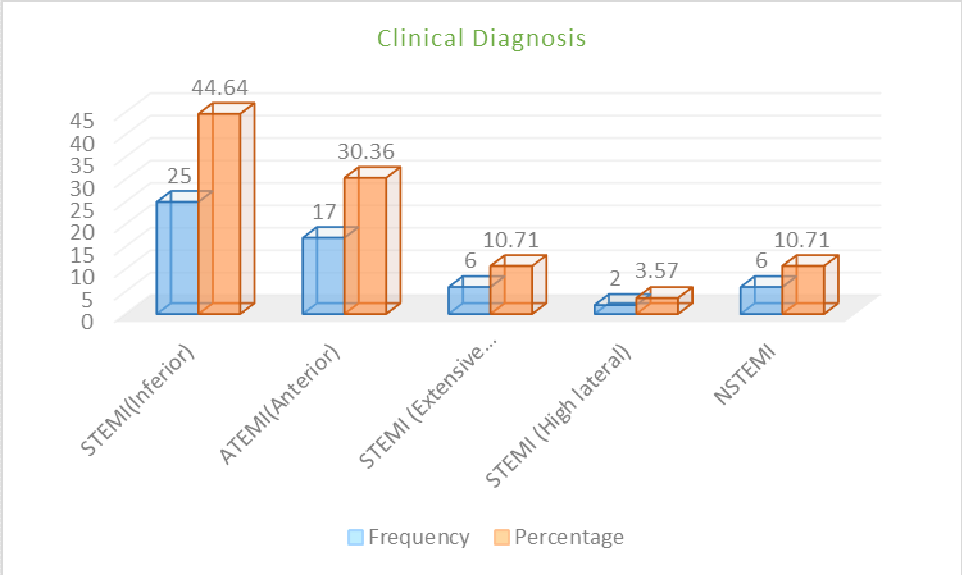

Figure-4: Clinical diagnosis after ECG and Cardicbiomarker (N=56)

Table-2: Clinical outcomes of the study population (N=56)

Outcomes	Frequency	Percentage
Well	13	23.21
Cardiogenic shock	17	30.36
LVF/Pulmonary edema	12	21.43
Mechanical complication	1	1.79
Tachyarrhythmias	5	8.93
Bradyarrhythmias	7	12.50
Cardiac arrest	4	7.14
Died within 24 hours of admission	7	12.50

DISCUSSION

Cardiovascular disease is a global public health problem contributing to 30% of global mortality and 10% of the global disease burden. The burden of cardiovascular disease is greater in low- and middle-income countries as compared to high-income countries because of the much larger population size and widespread exposure to increasing levels of risk factors such as unhealthy diet, physical inactivity, obesity, tobacco use, diabetes, raised blood pressure and abnormal blood lipids. [4, 5, 7] In the present study, the mean age of the patients with AMI was 58.98±10.99 years which is similar to 58.9±11.8 years in a large South Asian study. [6] However, the mean age for overall South Asian patients was 53±11.4 years in the South Asian study. The rate of AMI was higher in males than females (66% versus 34%) which is consistent with findings in previous studies. [11-13] Present study demonstrated that with increasing age the number of females with AMI also increased. This may be due to the loss of the protective effect of estrogen in post-menopausal women. The vasodilator action of estrogen may be responsible for this protective effect. [14] The rate of ST-segment elevation AMI was higher than non-ST segment elevation AMI in our study which was also the finding in a prospective analysis of registry data in India. [15] However, in one of the large studies in the Middle East, the majority of patients had NSTEMI. [13] There is a relative increase in the incidence of NSTEMI as compared to STEMI in western countries as described in an epidemiological study of coronary heart disease and acute coronary syndrome. [16] This shows that STEMI still constitutes the major type of acute myocardial infarction in our setting. The clinical presentation in our study showed chest pain as the predominant symptom (86.36%). Atypical symptoms like abdominal pain, dizziness, and syncope were observed in the higher age group as shown in a comparative study of acute MI in elderly and non-elderly in India. [16] Cigarette smoking was the leading risk factor and was mostly seen in male patients which was also the finding in the INTERHEART study. [17] The risk factor was present mostly in ST-segment elevation AMI (63.86 %) similar to that in a large cross-sectional western study. [18] Cigarette smoking was a leading risk factor for MI in South Asian studies as well. [11, 12] It is a well-known fact that cigarette smoking is associated with an increased incidence of acute AMI. Cigarette smoking is thought to cause initiation and/or propagation of thrombus formation by disrupting homeostasis secondary to increased oxidative stress as explained in an update of the pathophysiology of cigarette smoking and cardiovascular disease. [19] Diabetes mellitus alone was a risk factor in 18 (32.14%) patients in our study. There was a highly significant association between diabetes and AMI among Asians in a study among Asians and Europeans in the United Kingdom. [20] There is an increased risk of cardiovascular disease in diabetic patients as documented in the Framingham study. [21] Accelerated atherosclerotic plaque formation and intraluminal thrombosis in diabetics are thought to increase the incidence of AMI as well as mortality post-AMI which is well explained in an article from the institute for the prevention of cardiovascular disease, Harvard. [22] Hypertension was significantly associated with MI in different studies in South Asia. [6, 11, 12, 17] Diabetes and hypertension were common in the male gender in our study while it was more common in the female gender in the INTERHEART study. [17] Dyslipidemia was also present to a significant extent in our study with the female gender being exposed more than males while it was more common in the male gender in one study in Bangladesh. The anterior wall was the most common site of infarction similar to that in a study in India 10 while the inferior wall was the predominant site of infarction in

another study in Pakistan. [12] Patients with anterior wall AMI have a worse prognosis with an increased incidence of complications and deaths than inferior wall AMI. [23, 24] Although the follow-up data were not available, the higher incidence of anterior wall AMI may contribute to the increasing mortality burden from AMI in our setting.

Limitations of the study:

Patient surveillance was done only during the hospital stay. There was no follow-up on the evaluation of co-morbidity, and mortality after discharge. The study was conducted in a single hospital with a small sample size(N=56). So, the results may not represent the whole community.

CONCLUSION AND RECOMMENDATIONS

Among patients with acute myocardial infarction, we found a stepwise increase in risk for adverse clinical outcomes with each additional comorbidity. This association was less obvious in older ones. If younger multimorbid patients suffering an AMI may benefit from additional multimodal treatment to reduce their incremental risk of in-hospital mortality and other clinical outcomes. Still remains speculative and requires further prospective studies. Hence, the present study showed a small decline in the incidence of conduction disturbances as compared to the studies of the thrombolytic era, showing the beneficial effect of thrombolytic therapy. The present study population showed that conduction disturbances are complicated. Acute Myocardial Infarction are common in this thrombolytic era, requiring close observation and monitoring, as they have got a higher rate of complications and mortality during the hospital course.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee.

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