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Outcomes of Acute ST-Elevation Cardiac Disease in a Tertiary Level Hospital in Bangladeshi Young Adults' Risk Factors and Consequences

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Abstract **Original Research Article**

Background: AMI happens earlier and more often in South Asians compared to Western populations. In Bangladesh, very little information is known about the connections between avoidable risk factors and outcomes of AMI in young people. This research aims to discover risk variables and the in-hospital results of AMI among those under the age of 40 in Bangladesh. ***Methods:*** A cohort study of individuals with an acute case of Acute ST-Segment Elevation MI (STEMI) was done, which examined all patients aged under 40 and over 40 years of age in successive groups of 50. The clinical findings, biochemistry data, nutrition, and echocardiography result of the participants were compared against each other, including an examination and hospitalization outcomes. Regression analysis was done to determine the risk factors related to a patient's hospital-based treatment, controlling for other confounding variables previously discovered. ***Results:*** Young and older patients were about 36.5 and 57 years old, respectively. The most striking factors contributing to the greater incidence of AMI in the younger group were their age (OR 3.4, 95% CI 1.2–9.75), smoking (OR 2.4, 95% CI 1.04–5.62), family history of myocardial infarction (OR 2.4, 95% CI 1.11–5.54), homocysteine (OR 1.2, 95% CI 1.08–1.36), and frequent consumption of rice (OR 3.5, 95% CI 1.15–10.6). Lastly, beef consumption (OR 4.5, 95% CI 1.83–11.3) also contributed to a greater AMI risk. Older patients were considerably more likely to experience heart failure (a 70% higher probability), reinfarction (a 50% higher chance), arrhythmia (a 70% higher chance), and cardiogenic shock (a 6-fold larger risk) in multivariate analysis. ***Conclusion:*** Young AMI patients tend to have better outcomes in the hospital than their older counterparts since they have a distinct risk profile. To help Bangladesh youth avoid life-shortening diseases, Bangladesh should reduce avoidable risk factors, such as smoking, bad food, obesity, and poor lipid profiles.

Keywords: ST elevation, Cardiac disease, Myocardial Infarction.

INTRODUCTION

Cardiovascular disease (CVD) is a global health issue and it is both the cause of mortality and morbidity and mortality in industrialized and developing nations [1]. In the world, South Asian nations have the greatest occurrence of cardiovascular disease. It is predicted that by 2020, there will be more people with atherosclerotic cardiovascular disease in this area of the globe than in any other region [2].

South Asian people have a higher risk and earlier start of AMI, and the disease may be more serious or life-threatening than in the West. The incidence of AMI in younger people has increased in the last few years [3]. In young people, AMI (atherosclerotic and metabolic syndrome) has significant adverse effects, including death and severe disabilities [4], for patients, their families, and the nation's health systems. This has an elevated cost impact. Based on previous research, it seems that young AMIs patients (under 40 years) had a high frequency of smoking, family history, and lipid disorders, as well as an elevated risk of single-vessel disease, small vessel disease, and obstructive stenosis. It is essential to determine risk factors for AMI in this population to implement cost-effective risk factor reduction methods, especially for young patients with AMI, since they have unique clinical features and pathophysiology [5]. Heart disease is the result of many causes, which have all been extensively studied (IHD).

However, it is not yet clearly proven whether these risk factors have a role in the etiology of IHD and if they are significant for young patients in Bangladesh. There is a lack of data on risk factors and in-hospital outcomes for juvenile AMI patients in Bangladesh. We performed this research to discover risk variables and post-hospital outcomes in AMI in young patients (under 40 years) in Rajshahi, Bangladesh. Younger individuals tended to have better results and had a distinct pattern of risk variables than older patients. CVD is a global health issue, particularly in developing nations, associated with death and morbidity on a global scale. It is the number one cause of mortality and morbidity and is an epidemic in both developed and developing countries. With more than 40 million people affected, South Asia has the highest rates of cardiovascular disease (CVD) worldwide. 3, 4 estimates from the research called the Global Burden of Disease (GBD) project that this region will have more people with atherosclerotic cardiovascular disease (CVD) than any other area by 2020.

South Asian people have an elevated risk of AMI and have a more rapid start, developing the condition 5–10 years sooner than those in the West. The prevalence of AMI among younger patients has increased in recent years [6]. AMI may lead to mortality and disability in early adulthood, with severe implications for patients, families, and the national healthcare system. It has a higher financial cost for the country. In the previously published literature, younger patients with AMI (fewer than 40 years) were found to have a high prevalence of smoking, a family history of cardiovascular disease, and dyslipidemia.

Furthermore, younger patients with this disease had a high incidence of normal coronary arteries, non-obstructive stenosis, or single-vessel disease. Clinically and pathologically distinct, younger individuals have a greater burden of disease that calls for risk factor reduction and the development of secondary preventive methods that are more economical in these patients. Multiple studies have shown that risk factors for cardiovascular diseases, such as a diet high in saturated fat and cholesterol, may contribute to its development (IHD). There is not insufficient evidence to suggest that risk factors play a role in the etiology of IHD, nor are they as significant for the patients in Bangladesh. In-hospital prognosis and risk variables for juvenile AMI patients in Bangladesh remain understudied. Therefore, we did this research to learn about the risk factors and the in-hospital outcome associated with AMI in young patients (those between the ages of <40) compared to older patients (those who are at least 40 years old). Younger patients would have better results and would have a distinct risk profile than older individuals.

METHODS

Study population and setting

In July 2019, and extending until June 2020, we performed prospective observational research on patients with AMI referred to the Department of Cardiology, Rajshahi Medical College, and Multicentral tertiary level Rajshahi Bangladesh. We attempted to recruit a pool of 50 consecutive patients under the age of 40 and a separate pool of 50 consecutive patients beyond 40. Only adult patients, of both sexes, with the symptoms of STEMI or AMI presenting with chest pain symptoms within 12 hours after the start of symptoms and who had given their informed permission were included in the study. Valvular heart disease, congenital heart disease, and cardiomyopathy were among the exclusion criteria, and individuals who did not agree to give written informed permission were also excluded. AMI was diagnosed by identifying an increase in one or more cardiac biomarkers (troponin or cTnT) above the 99th percentile of the upper reference limit, together with evidence of regional wall motion abnormality, either by the presentation of new ST-T changes or LBBB and new ischemia as detected by imaging evidence of regional wall motion abnormality or loss of viable myocardium [7].

DATA COLLECTION

The attending physician inspected all participants who presented to the Emergency Room during the previous 12 hours and evaluated them for the eligibility criteria. To increase the chances of getting a seat in the study, all patients who met the criteria were referred to the study team by the attending physician and first interviewed by a member of the research team on the wards of the Cardiology Department, following stabilization of the patient's condition. Laboratory assistants skilled in blood collection took blood samples from the wards and delivered them to the laboratory, where the samples were used for biochemical testing. Echocardiography testing was conducted in the wards by one of the investigators (MAK). During the time of their hospitalization, all participants were followed up.

Data were gathered via face-to-face interviews and clinical examination by utilizing a structured questionnaire and pretested clinical examination form (Supplementary File 1). a form with questions including information on demographics, body measurements, and risk factors (dietary pattern, current tobacco use, family history of premature CAD, history of angina). Specific food consumption was measured using questions about dietary patterns. For these tests, data from laboratory tests (RBS, serum creatinine, electrolytes, lipid profile, troponin, FBS, 2 hours after FBS, and total plasma homocysteine) and clinical data (blood pressure, ECG, echocardiography, and in-hospital outcomes) were collected (as defined below). Using established clinical standards, weight, height, waist circumference (WC), hip circumference (HC), and waist-hip ratio (WHR) were assessed [8]. BMI was calculated as weight in kilograms multiplied by height in centimeters. Once blood pressure was measured, the average number was entered into the system. Once within 24 hours of admission, and a second time within one day of admission or upon discharge; the more often the echo is performed, the better. Echocardiographic measurements included left ventricular internal diameter (LVID), left ventricular internal diameter (LVIDs), regional wall motion abnormality (RWMA), and left ventricular ejection fraction (LVEF).

Definition of variables

A person's systolic blood pressure must be more than 140 mmHg, or their diastolic blood pressure must be 90 mmHg or greater for two readings. The person is currently taking any kind of hypertension medication [9]. A fasting plasma glucose concentration of ≥200 mg/dl (11.1 mmol/L) or an FPG of ≥126 mg/dl (7 mmol/L) during an OGTT or with anti-diabetic medicines is diagnostic of diabetes. LDL cholesterol is over 100 mg/dl, total cholesterol is above >200 mg/dl, HDL cholesterol is below <40 mg/dl, and triglycerides are above >150 mg/dl; this is according to ATP-III standards [10]. For family early history of IHD, which has previously been associated with the development of angina, MI, and sudden cardiac death (SCD), at least one direct blood relative (parents, siblings, children) who were <55 years old when they experienced any of the following were examined: angina, MI, and SCD without obvious cause [11]. Tissue hypoperfusion resulting from heart failure following adjustment of preload was the diagnostic criteria for cardiogenic shock. Patients with cardiogenic shock often have decreased blood pressure (a systolic blood pressure under 90 mmHg or a reduction of mean arterial pressure below 30 mmHg) or poor urine output (less than 0.5 ml/kg/hour). For congestive heart failure, we utilized the Killip categorization system, which assigned patients into three categories as follows: Class I: Crackles/rales in the absence of rales in the lung fields; Class II: Few or no rales over 50% of the lung fields or less, together with a gallop of S3; Class III: Few or no rales over the majority of the lung fields, along with a gallop of S3. Cardiogenic shock class: IV.

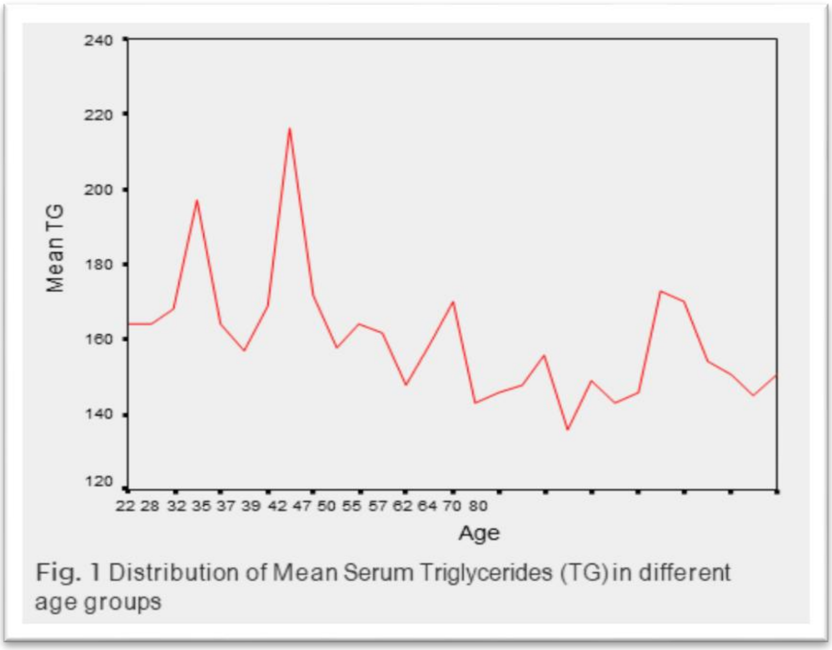

Fig-1: Distribution of Mean Serum Triglycerides (TG) in different age groups

BMI was computed as weight (kg) / height (m2) and was categorized as underweight, normal, overweight, and obese based on a person's BMI score, which ranged from 18.5 to 30. Inpatient results

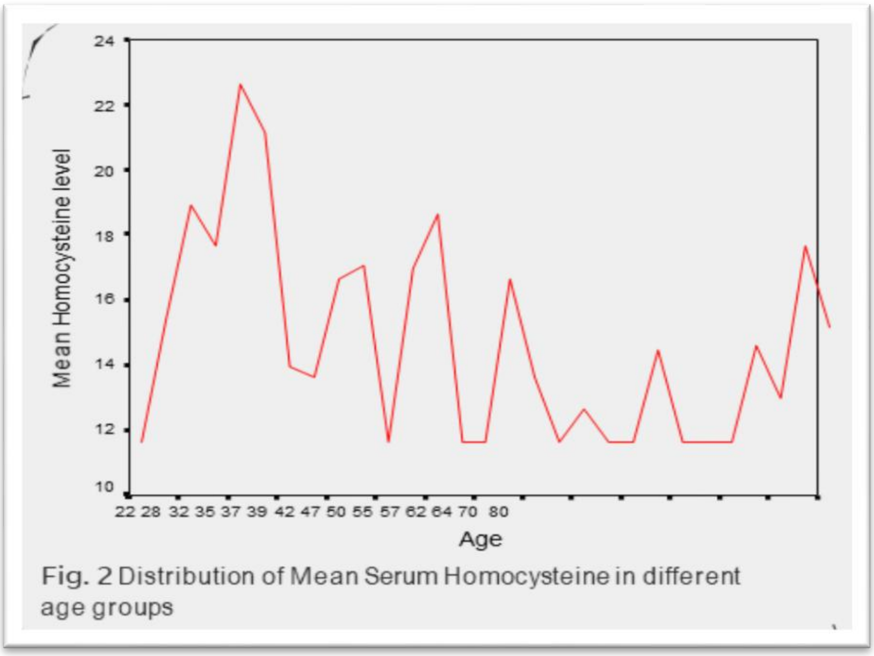

Fig. 2 Distribution of Mean Serum Homocysteine in different age groups

Fig-2: Distribution of Mean Serum Homocysteine in different age groups

To find out how patients did after they were discharged, their hospital stay, heart failure, post-MI angina, reinfarction, arrhythmia, and cardiogenic shock were recorded according to a standardized criterion: time in the hospital, heart failure, post-MI angina, reinfarction, arrhythmia, and cardiogenic shock [12].

DATA ANALYSIS

SPSS version 17 was used to do the data analysis (SPSS Corp.). The values used in our report are given in frequencies (n), percentage (percent), and ± SD. In addition to Student's t-test and Fisher's exact test, the two research groups were compared using the chi-square test where appropriate. Multivariate logistic regression was used to see whether risk factors were linked with AMI and in-hospital complications after considering all possible confounding variables (education and socioeconomic status). To find significant results, an experiment should have a p-value less than 0.05.

RESULTS

Clinical characteristics and biochemical status

The table below displays the participants' clinical characteristics and biochemical results. The mean age for the younger group was 36.5, with a standard deviation of 4.6, while the older group was 57.0, with a standard deviation of 9.1. More men were affected than women (young 88 percent vs old 68 percent). There was a substantially greater percentage of smoking (74% of the younger group had smoked vs 54% of the older group), family history of IHD (56% of the younger group had a family history of IHD vs 34% of the older group) and a higher BMI in the younger group. as opposed to hypertension (15% vs 76%), diabetes (22% vs 46%) and history of angina (12% vs 48%), hypertension (15% vs 76%), diabetes (22% vs 46%), and angina (12% vs 48%) were substantially greater in individuals of the older group. The younger group had substantially higher mean blood homocysteine and triglyceride levels, whereas the older group had significantly higher HDL cholesterol levels. But the difference was not statistically significant. Blood sugar concentrations were similar for all ages (p = 0.37). Fig. 1, Fig. 2

Food habits

In Table 2, the dietary habits of the individuals are shown. The younger group had a substantially greater mean frequency of consuming rice, beef, chicken, and fish. Older people were much more likely to say they consumed bread, fruits, and vegetables regularly. While the younger group reported more significant amounts of rice, beef, and chicken intake, while the older group reported higher fruit and vegetable consumption levels, the two groups had similar amounts of fish consumption [13].

Table-1: Clinical characteristics and biochemical status of study participants (n = 100)

Variables	Young group (age ≤ 40) (n = 50)	Older group (age > 40) (n = 50)	p-value
Clinical characteristics **Age (Mean ± SD)**	**36.5 ± 4.6**	**57.0 ± 9.1**	**0.001***
Male sex	44 (88)	34 (68)	0.02
Smoking	37 (74)	27 (54)	0.04
Chewing tobacco	7 (14)	16 (32)	0.03
Dyslipidemia	26 (52)	20 (40)	0.22
Hypertension	7 (14)	38 (76)	0.001
Diabetes mellitus	11 (22)	23 (46)	0.01
Family history of IHD	28 (56)	17 (34)	0.02
BMI (mean ± SD)	25.21 ± 3.6	24.26 ± 3.61	0.19[a]
Normal (18.5 – 24.9)	23 (56)	28 (56)	0.32
Over weight (25 – 29.9)	16 (32)	14 (28)	0.66
Obese (≥30)	11 (22)	8 (16)	0.44
Waist hip ratio (mean ± SD)	0.96 ± 0.06	0.95 ± 0.05	0.42
Waist hip ratio (>1)	13 (26.0)	9 (18.0)	0.33
History of angina	6 (12)	17 (48)	0.02
Biochemical status			
Serum homocysteine	17.14 ± 5.12	13.84 ± 2.93	0.001
C-reactive protein (CRP)	14.66 ± 6.8	13.02 ± 2.53	0.11
Uric acid	6.7 ± 6.0	5.6 ± 0.6	0.21
Random blood sugar (RBS)	10.6 ± 6.2	11.7 ± 6.0	0.37
Total cholesterol	193.10 ± 21.95	186.58 ± 22.20	0.14
Triglyceride	165.26 ± 23.52	150.40 ± 16.88	0.01
LDL cholesterol	121.69 ± 22.36	113.80 ± 25.05	0.10
HDL cholesterol	38.36 ± 4.11	42.70 ± 4.83	0.01

Values are Mean ± SD or n (%) unless otherwise indicated
[*]*p*-value reached from unpaired t-test
[a]chi-square test

Echocardiography findings

In both groups, the anterior, inferior, and anteroseptal MI rate was the same (Table 3). Younger patients (defined as under the age of 50) had a substantially greater mean ± SD in the left ventricular ejection fraction (LVEF) (p = 0.004). Although the incidence of heart failure (according to Killip classification) and the presence of any arrhythmia did not substantially vary by age, according to the research, there is an increase in the frequency of heart failure with age. The older patients had a greater incidence of mechanical problems associated with the MR than the younger group (p < 0.05).

Table-2: Distribution of study subjects by food consumption

Variables	Young group (age ≤ 40)	Older group (age > 40)	*p*-value
Rice	50 (100)	50 (100)	
Frequency (per day)	1.98 ± 0.42	1.78 ± 0.54	0.04
1 time	5 (10)	14 (28)	
≥2 times	45 (90)	36 (72)	
Bread	50 (100)	48 (96)	
Frequency (per day)	1.12 ± 0.32	1.28 ± 0.45	0.04
1 time	44 (88)	36 (72)	
2 times	6 (12)	14 (28)	
Beef	25 (50)	9 (18)	
Frequency (per week)	2.04 ± 0.84	1.33 ± 0.50	0.02
1 time	8 (32)	6 (66.7)	
≥2 times	17 (68)	3 (33.3)	

Variables	Young group (age ≤ 40)	Older group (age > 40)	*p*-value
Mutton	4 (8)	2 (4)	
Frequency (per week)	1.50 ± 0.57	2 ± 0.5	0.31
Chicken	43 (86)	47 (94)	
Frequency (per week)	1.33 ± 0.52	1.13 ± 0.33	0.03
1 time	30 (69.8)	41 (87.2)	
≥2 times	13 (30.2)	6 (12.8)	
Fish	50 (100)	50 (100)	
Frequency (per week)	2.80 ± 0.90	1.13 ± 0.80	0.03
1 − 2 times	19 (38)	32 (64)	
≥3 times	31 (62)	18 (36)	
Egg	5 (10)	4 (8)	
Frequency (per week)	2.80 ± 2.3	1.00 ± 1.20	0.18
Milk	4 (8)	3 (6)	
Frequency (per week)	1.25 ± 0.50	1.33 ± 0.57	0.84
Fruits	50 (100)	49 (98)	
Frequency (per week)	1.74 ± 0.66	2.02 ± 0.24	0.02
1 time	19 (38)	1 (2)	
≥2 times	31 (62)	48 (98)	
Vegetables	50 (100)	50 (100)	
Frequency (per week)	3.40 ± 0.83	3.78 ± 0.58	0.01
2 times	9 (18)	4 (8)	
3 times	14 (28)	3 (6)	
>4 times	27 (54)	43 (86)	
values are n (%) and mean ± SD			

In-hospital outcomes

Table 4 shows the in-hospital outcome of the study participants. The mean duration of hospitalization was almost double in the older group than in the younger group (p = 0.001).

Table-3: Echocardiography findings of the study participants (N = 100)

Variables	Young group	Older group	p-value
	(age ≤ 40) n = 50 Number (%)	(age > 40) n = 50 Number (%)	
Anterior MI Inferior MI Antero-septal MI	23 (46) 16 (32) 11 (22)	22(24) 18(36) 10(20)	
Left ventricular ejection fraction (LVEF)			
LVEF <40 40 - 49 ≥50	54.4 ± 7.7 0 (0) 10 (20) 40 (80)	49.8 ± 7.8 2(4) 22(44) 26(52)	0.004 0.01 0.0003
Incidence of heart failure (Killip classification)			
Class I Class II Class III Class IV	2 (4) 2 (4) 0 (0) 1 (2)	5(10) 3(6) 2(4) 3(6)	0.23 0.64 0.30
Pattern of arrhythmia			
CHB AF VT/VF	2 (4) 1 (2) 2 (4)	7(14) 3(6) 3(6)	0.08 0.30 0.60
Mechanical complications			
MR VSR	1 (2) 0 (0)	6(12) 1(2)	0.05

There was a trend towards a more significant survival rate in the younger group, but the result was not statistically significant (p = 0.05). A statistically significant increase in the rates of heart failure, severe arrhythmias, and mechanical problems was seen in the older group. It was shown that an anterior and inferior type of myocardial infarction (AMI) caused a lower percentage of fatalities in the younger group (13.64%) than in the older group (33.33%). Logistic regression analysis revealed risk variables and in-hospital outcomes in young patients, as shown in Table 5.

Table-4: Comparison of in-hospital outcome between two groups (N = 100)

Variables	**Young group (age ≤ 40) n = 50**	**Older group (age > 40) n = 50**	***p*-value**
	Number (%)	Number (%)	
Duration of hospital stay (days) (Mean ± SD)	5.08 ± 1.8	10.7 ± 1.8	0.001
Heart failure	5 (10)	13 (26)	0.04
Post MI angina	3 (6)	8 (16)	0.11
Re-infarction	2 (4)	5 (10)	0.23
Significant arrhythmias	5 (10)	13 (26)	0.04
Cardiogenic shock	1 (2)	3 (6)	0.30
Mechanical complications	1 (2)	7 (14)	0.02
Death	1 (2)	6 (12)	0.05

Some significant risk factors for the development of AMI in the younger group include Male sex (OR 3.4, 95% CI 1.2 to 9.75), smoking (OR 2.4, 95% CI 1.04 to 5,62), family history of IHD (OR 2.4, 95% CI 1.11 to 5,54), homocysteine level (OR 1.2, 95% CI 1.08 to 1.36), rice intake ≥2 times daily (OR 3.5, 95% CI 1.15 to 10.6), and beef consumption (OR 4.5, 95% CI 1.83 to 11.3). The likelihood of developing heart failure, reinfarction, arrhythmia, and cardiogenic shock was seven to fifteen times greater in patients aged 65 and above.

DISCUSSION

According to the greatest information currently available, this is the first research to investigate AMI's risk factors and hospital outcomes in young individuals in Bangladesh. Family history of heart disease, being male, being overweight, having high homocysteine and triglycerides, and smoking are the most prevalent risk factors for young AMI patients. Compared to the older patients, the younger patients had a distinct risk factor profile and improved in-hospital outcomes. Men comprise the bulk of our participants, in agreement with research conducted in Bangladesh that found the proportion of male patients between 85 and 92 percent [14]. Khan and colleagues studied young AMI patients and found that 84.4% of the participants smoked, 46.9% had hypertension, 56.3% had dyslipidemia, 12.5% had diabetes, and 34.4% had a family history of cardiovascular disease with higher triglyceride levels and lower HDL levels [15]. Previous research has shown the same results, according to the data presented here. AMI is more frequently observed in men, and smoking is the most prominent risk factor in individuals with AMI in Bangladesh [16]. We found that men were 3.4 times more likely to have AMI than females before sixty. Forty-three percent of our participants had greater BMI, and twenty-five percent of AMI patients aged 25 to 34 had WHR < 1. The mean BMI and WHR of the younger patients were much greater than that of, the older patients, although the difference was not statistically significant. Both BMI and WHR are linked to an increased risk of cardiovascular disease (CVD) and death. As shown in recent research in Bangladesh, hypertension is associated with dyslipidemia [17]. Among patients with AMI, young individuals exhibited more significant lipid disorders and lower hypertension levels than older patients. Our results provide credence to the view that smoking cessation and lifestyle treatments to combat cardiovascular disease in youth are both essential. Previous studies indicate that young AMI patients may have coronary artery spasm resulting in a thrombus or a combination of thrombus and occlusion, which might be due to the synergistic effect of smoking and dyslipidemia [18]. Based on these findings, raising awareness of quitting smoking, eating a healthy diet, getting mammograms and anti-platelet medicines early, and using distal protection in patients with certain risk factors may be more successful in this group of patients.

Table-5: Logistic regression for risk factors and in-hospital outcomes of AMI in the young group

Independent variables	B	Wald	OR	95 % CI		
				Lower	Upper	p-value
Male sex	1.239	5.454	3.451	1.220	9.759	0.02
Smoking	0.886	4.252	2.425	1.045	5.626	0.04
Family history of IHD	0.904	4.804	2.471	1.110	5.547	0.03
BMI (Overweight)	0.191	0.190	1.210	0.514	2.851	0.66
Homocysteine level	0.198	11.453	1.219	1.087	1.367	0.001
TG	0.036	10.633	1.037	1.014	1.059	0.001
LDL	0014	2.633	1.015	0.997	1.035	0.11
HDL	−0.356	17.316	0.70	0.592	0.826	0.001
Eating rice (≥2 times daily)	1.253	4.883	3.50	1.152	10.633	0.03
Eating beef (per week)	1.516	10.670	4.56	1.834	11.316	0.01
Vegetables (≥2 times) weekly	−1.655	11.105	0.191	0.072	0.506	0.001
Heart Failure	2.018	6.102	7.524	1.517	37.311	0.01
Re-infarction	1.952	4.179	7.040	1.084	45.727	0.04
Arrhythmia	2.733	9.464	15.385	2.696	87.776	0.002
Cardiogenic shock	4.234	11.246	69.00	5.809	85.519	0.001

A comparison of mean levels of homocysteine, CRP, uric acid, and TG and HDL cholesterol levels revealed that younger individuals had greater amounts on average. In research in Bangladesh, there was an inverse correlation between high levels of CRP and the existence of coronary collateral development that was apparent on angiograms. Additionally, it was shown that young patients had substantially greater levels of TG and lower levels of HDL-C, both of which are established risk factors for AMI. In this group of younger individuals, they may have less coronary collateral vessels, which may lead to an earlier case of myocardial infarction. Previously, the presence of atherosclerotic lesions in the coronary arteries was shown to rise with the amount of plasma homocysteine concentration [19]. which is a powerful predictor of death in patients with coronary artery disease who had undergone angiography [20]. No vessel involvement was shown to be most frequent in the young in this research, which was conducted in Bangladesh (21.9 percent vs 12.5 percent). Lower total cholesterol increased HDL, and higher LDL is shown in the younger age group, while the opposite occurs in the older age group (increased total cholesterol, lower HDL, and lowered LDL).

The mean ejection percent was found to be substantially greater in the younger group. The groupings among our younger and older participants included 46 percent of those with anterior-MI, 32 percent with inferior-MI, and 22 percent with anteroseptal-MI. Acute anterior-MI, acute anteroseptal-MI, acute inferior-MI, and acute infer posterior-MI were found in Bangladesh's research on individuals with cardiovascular disease.

The younger group reported substantially greater rice and beef consumption frequency and significantly lower fruit and vegetable consumption frequency than the older group. Prior research has revealed that a poor diet consisting mostly of carbohydrates with few fruits and vegetables is a significant risk factor for cardiovascular disease. It is difficult to conclude dietary findings because of various research designs and eating patterns in different nations. This finding is also consistent with prior research, as we found [21].

Limited evidence indicates that prognosis may be better in young people with AMI than in older adults with the disease. In addition to the older individuals in our research, we found that elderly patients with AMI had substantially greater mortality and cardiovascular events than younger patients. An Indian investigation confirmed this finding. The younger MI patients had an in-hospital death rate of 1–6% in the research by Chowdhury & Marsh, whereas the older patients had an in-hospital mortality rate of 8–22% [22]. Also, in a separate investigation, researchers found that young patients with AMI had abrupt symptoms and had more complicated vessel stenosis morphological characteristics and less widespread CAD [23]. Significant morbidity, psychological impacts, and financial burden for the patient and the family are among the outcomes reported with AMI in the young. Improving prognosis and preventing AMIs in the young population are facilitated by detecting and managing the risk factors for cardiovascular disease seen in young adults. According to prior studies, our results indicating younger patients had superior clinical outcomes [24]. Are in accord. Studies in various nations have shown that in-hospital outcomes for AMI patients are better owing to a reduced involvement of coronary vessels. These patients, however, are more likely to have long-term problems such as prior MI, peripheral vascular disease, and poor ejection fraction.

Prohibiting the research

To better understand our research findings, we need to bear in mind the different characteristics and constraints we encountered. First, we did an observational study on a few patients at a particular hospital, with a small number of participants. While this research may have therapeutic value, it may not be enough to impact practice or policy. Additional long-term, multicenter longitudinal studies should be conducted with large enough sample sizes and sufficient power. The findings may not represent the entire AMI population since data were gathered from only one hospital. While this is true, the fact that the National Institute of Cardiovascular Diseases is the main cardiovascular disease center in the nation means that patients are more likely to get better care if they go there. Third, data on eating habits was gathered based on patients' self-reported observations, and there may be reporting bias. Results may be generalized beyond a small dataset since many comparisons are performed using limited data. In addition, there is no risk of type I and type II errors, as we were unable to compensate for multiple hypothesis testing. Last, our patients were not assessed by angiography, which may have provided greater information on their level of ischemia.

CONCLUSION

This is the first research to look at the immediate impact of an AMI in patients in Bangladesh and identify potential risk factors. Our findings demonstrate that individuals who suffer from AMI have a distinctive risk profile, such as younger patients with a more limited kind of MI and higher in-hospital survival than older patients. In addition, patients in their youth with AMI had a significantly higher prevalence of smoking, a family history of cardiovascular disease, unhealthy diet, obesity, and lipid abnormalities, all of which are preventable risk factors. They should be considered in the efforts to prevent AMI in Bangladesh and other developing countries. However, long-term follow-up investigations are required to verify the etiology of AMI in young individuals.

REFERENCES

1. Murray, C. J., & Lopez, A. D. (2013). Measuring the global burden of disease. *New England Journal of Medicine*, *369*(5), 448-457.
2. Islam, S. M. S., Purnat, T. D., Phuong, N. T. A., Mwingira, U., Schacht, K., & Fröschl, G. (2014). Non‐ Communicable Diseases (NCDs) in developing countries: a symposium report. *Globalization and health*, *10*(1), 1-8.
3. Yusuf, S., Reddy, S., Ôunpuu, S., & Anand, S. (2001). Global burden of cardiovascular diseases: part I: general considerations, the epidemiologic transition, risk factors, and impact of urbanization. *Circulation*, *104*(22), 2746-2753.
4. Zimmerman, F. H., Cameron, A., Fisher, L. D., & Grace, N. G. (1995). Myocardial infarction in young adults: angiographic characterization, risk factors and prognosis (Coronary Artery Surgery Study Registry). *Journal of the American College of Cardiology*, *26*(3), 654-661.
5. Shiraishi, J., Kohno, Y., Yamaguchi, S., Arihara, M., Hadase, M., Hyogo, M., ... & Matsubara, H. (2005). Acute myocardial infarction in young Japanese adults clinical manifestations and in-hospital outcome. *Circulation Journal*, *69*(12), 1454-1458.
6. Sharma, M., & Ganguly, N. K. (2005). Premature coronary artery disease in Indians and its associated risk factors. *Vascular health and risk management*, *1*(3), 217.
7. Braunwald, E., Antman, E. M., Beasley, J. W., Califf, R. M., Cheitlin, M. D., Hochman, J. S., ... & Smith, S. C. (2002). ACC/AHA 2002 guideline update for the management of patients with unstable angina and non–ST-segment elevation myocardial infarction—summary article: a report of the American College of Cardiology/American Heart Association task force on practice guidelines (Committee on the Management of Patients With Unstable Angina). *Journal of the American College of Cardiology*, *40*(7), 1366-1374.
8. Center for Disease Control (CDC). (2015). National Health and Nutrition Examination_Survey (NHANES) Anthropometry Procedures. Centers for Disease Control_and Prevention National Center for Health Statistics NHANES 1999-2000_Karim. BMC Cardiovascular Disorders, 15; 73 Page 7 of 8_Body Composition Procedures Manual (2000) Available at:http://_www.cdc.gov/nchs/data/nhanes/bc.pdf. Accessed November 15, 2014
9. Lenfant, C., Chobanian, A.V., Jones, D.W., Roccella, E.J. (2003). Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Seventh report of the Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7): resetting the hypertension sails. *Hypertens Dallas Tex 1979*, *41*(6); 1178–9.
10. Lorenzo, C., Williams, K., Hunt, K. J., & Haffner, S. M. (2007). The National Cholesterol Education Program–Adult Treatment Panel III, International Diabetes Federation, and World Health Organization definitions of the metabolic syndrome as predictors of incident cardiovascular disease and diabetes. *Diabetes care*, *30*(1), 8-13.
11. Smith Jr, S. C., Blair, S. N., Bonow, R. O., Brass, L. M., Cerqueira, M. D., Dracup, K., ... & Taubert, K. A. (2001). AHA/ACC guidelines for preventing heart attack and death in patients with atherosclerotic cardiovascular disease: 2001 update: a statement for healthcare professionals from the American Heart Association and the American College of Cardiology. *Circulation*, *104*(13), 1577-1579.
12. Consultation, W. E. (2004). Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. *Lancet (London, England)*, *363*(9403), 157-163.
13. Hasan, H. Under Five Children Regarding Protein-Energy Malnutrition at Rajshahi City Corporation -

Google Search. EAS J Nutr Food Sci; Available from: https://www.easpublisher.com

14. Islam, A. E. M. M., Faruque, M., Chowdhury, A. W., Khan, H. I. R., Haque, M. S., Ali, M. S., ... & Rashid, M. A. (2011). Risk factor analysis and angiographic profiles in first 228 cases undergone coronary angiography in cardiac Cath Lab of Dhaka medical college hospital. *Cardiovascular Journal*, *3*(2), 122-125.
15. Khan, A. R., & Majumder, A. A. S. (2009). Study of lipid profile and coronary angiographic pattern in young Bangladeshi patients with acute coronary syndrome. *Cardiovascular Journal*, *1*(2), 183-188.
16. Islam, M. M., Ali, A., Khan, N. A., Rahman, A., Majumder, A. S., Chowdhury, W. A., ... & Jalaluddin, M. (2006). Comparative study of coronary collaterals in diabetic and nondiabetic patients by angiography. *Mymensingh medical journal: MMJ*, *15*(2), 170-175.
17. Choudhury, K. N., Mainuddin, A. K. M., Wahiduzzaman, M., & Islam, S. M. S. (2014). Serum lipid profile and its association with hypertension in Bangladesh. *Vascular health and risk management*, *10*, 327.
18. Tun, A., & Khan, I. A. (2001). Myocardial infarction with normal coronary arteries: the pathologic and clinical perspectives. *Angiology*, *52*(5), 299-304.
19. Islam, K. N., Chowdhury, A. W., Khondoker, A. H., Haque, M. S., Sabah, K. M. N., Amin, M. G., ... & Saleh, M. A. D. (2016). Effect of Serum Homocysteine on Coronary Artery Disease in Younger and Older Ischaemic Heart Disease Patients. *Cardiovascular Journal*, *8*(2), 138-142.
20. Nygård, O., Nordrehaug, J. E., Refsum, H., Ueland, P. M., Farstad, M., & Vollset, S. E. (1997). Plasma homocysteine levels and mortality in patients with coronary artery disease. *New England Journal of Medicine*, *337*(4), 230-237.
21. Malmberg, K., Båvenholm, P., & Hamsten, A. (1994). Clinical and biochemical factors associated with prognosis after myocardial infarction at a young age. *Journal of the American College of Cardiology*, *24*(3), 592-599.
22. Choudhury, L., & Marsh, J. D. (1999). Myocardial infarction in young patients. *The American journal of medicine*, *107*(3), 254-261.
23. Chen, L., Chester, M., & Kaski, J. C. (1995). Clinical factors and angiographic features associated with premature coronary artery disease. *Chest*, *108*(2), 364-369.
24. Yeh, R. W., Sidney, S., Chandra, M., Sorel, M., Selby, J. V., & Go, A. S. (2010). Population trends in the incidence and outcomes of acute myocardial infarction. *New England Journal of Medicine*, *362*(23), 2155-2165.