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Prevalence of Various Clinical and Angiographic Features among Young ACS Patients

Md. Golam Hossain[1*], Amirul Islam Talukdar[2], Abdullah Al-Mahmud[2], Abu Zahid[2], Anirban Mallik[3], Rifat Mahmud Nur[3], Khalid Hasan[3]

[1]Associate Professor, Head of Department, Department of Cardiology, Prime Medical College Hospital, Rangpur, Bangladesh
[2]Resident Physician, Department of Cardiology, Prime Medical College Hospital, Rangpur, Bangladesh
[3]Indoor Medical Officer, Department of Cardiology, Prime Medical College Hospital, Rangpur, Bangladesh

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***Corresponding author:** Dr. Md. Golam Hossain
Associate Professor, Head of Department, Department of Cardiology, Prime Medical College Hospital, Rangpur, Bangladesh

Abstract **Original Research Article**

Introduction: Acute coronary syndrome in people under the age of 35 is a distinct subset of the population with a different clinical presentation than older individuals. The pattern and intensity of coronary artery involvement vary, indicating a varied underlying etiology. Improved management will result from a better grasp of this unique challenge. The aim of the study was to understand the common factors and features affecting patients with ACS. ***Methods:*** This cross-sectional observational study was conducted at the department of cardiology, Prime Medical College Hospital, Rangpur, Bangladesh during the period of January 2019 to December 2020. A total of 40 participants were selected through purposive sampling technique following the inclusion and exclusion criteria. ***Result:*** Male: Female ratio was 9:1, and majority (67.5%) were from the age group of 31-35 years. Obesity was observed in 12.5% of the participants, while 27.5% were overweight. 22.5% of the participants had mild stress, while the remaining 15% of the participants had moderate levels of stress. Chest pain was a common presentation among all the participants, and 30% had shortness of breath. ***Conclusion:*** The Acute coronary syndrome in young is almost exclusively seen in male. Smoking, family history of coronary artery disease, dyslipidemia, raised LpA are major risk factors.

Keywords: Cholesterol, Serum, Coronary, Angiograph, Heart.

INTRODUCTION

Acute coronary syndrome has emerged as a useful operational phrase that refers to a range of disorders that are consistent with acute myocardial ischemia and/or infarction and are often caused by a sudden decrease in coronary blood flow. Acute coronary syndrome refers to a group of clinical symptoms that includes unstable angina (UA), non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI) [1]. Acute coronary syndrome is a prominent cause of morbidity and mortality globally, and its prevalence is expected to rise, particularly in emerging countries [2]. Ischemic heart disease is the leading cause of death worldwide, accounting for 7 million of the 53 million fatalities reported in 2010. By 2025, cardiovascular mortality would likely outnumber all other major disease groups, including infection, cancer, and trauma [3, 4]. Cardiovascular disease is a serious public health and clinical concern in South Asia (India, Pakistan, Bangladesh, and Nepal). According to the Global Burden of Disease Study, by 2020, this area of the world will have more people with atherosclerotic cardiovascular disease than any other [5, 6]. Furthermore, these individuals' risk factor profiles and prognoses differ from those of older patients [7]. Other probable contributing variables for myocardial infarction etiology include substance misuse, coronary artery abnormalities, hypercoagulable condition, and oral contraceptive usage in young women [8, 9]. Acute myocardial infarction (AMI) has been more common in younger age groups in recent years [10]. Furthermore, AMI in extremely young patients under the age of 35 has received less attention. It is believed that patients under the age of 35 account for fewer than 2% of all AMIs [11].

OBJECTIVE

General Objective

- To understand the common factors and features affecting patients with ACS.

METHODS

This cross-sectional observational study was conducted at the department of cardiology, Prime Medical College Hospital, Rangpur, Bangladesh during the period of January 2019 to December 2020. The study population consisted of a total of 40 young adults under the age of 35 years who were admitted to the study hospital for some form of acute coronary syndromes and had undergone coronary angiogram during the study period. Gensini scoring was used to identify patients at higher risk for significant carotid stenosis. Informed written consent was obtained from all the participants prior to data collection. Data were collected using the predesigned semi structured data collection sheet. Data analysis was carried out by using the statistical package SPSS version 23.0 windows software. Categorical data were analyzed by Chi-Square test. P value of less than 0.05 was considered significant.

Inclusion Criteria

- Patients aged 35 years of younger
- Patients who underwent coronary angiogram
- Patients who had given consent to participate in the study.

Exclusion Criteria

- Patients over the age of 35 years
- Unable to answer the criteria question.
- Exclude those affected with other chronic diseases etc.

RESULTS

Table 1: Distribution of the participants by physical characteristics (n=40)

Characteristics	n	%
Gender		
Male	36	90.0%
Female	4	10.0%
Age		
≤20	2	5.0%
21-30	11	27.5%
31-35	27	67.5%
BMI		
Normal (18.0-22.9)	33	82.5%
Overweight (23.0-24.0)	2	5.0%
Obese (>24.0)	5	12.5%

Among the participants, male prevalence was extremely high, with 90% male and 10% female prevalence recorded. Very few (5%) were 20 years or younger. 27.5% were between the age of 21-30 years, and the majority (67.5%) were between the age of 31-35 years. BMI was normal for 82.5% of the participants, 5% were overweight and 12.5% were obese.

Table 2: Distribution of study participants according to stress levels (n=40)

Stress Level	n	%
No stress	25	62.5%
Mild Stress	9	22.5%
Moderate Stress	6	15.0%

Majority of the participants (62.5%) had no recorded stress at the time of admission. 22.5% of the participants had mild stress, while the remaining 15% of the participants had moderate levels of stress.

Table 3: Distribution of the study subjects according to clinical presentation (n=40)

Clinical presentations		n	%
Chest pain	Atypical	2	5.0%
	Typical	38	95.0%
Shortness of breath		12	30.0%
Nausea/vomiting		4	10.0%
Palpitation		3	7.5%
Sweating		2	5.0%

Chest pain was a common presentation among all the participants, but 95% had typical chest pain while 5% had atypical chest pain. 30% of the participants had reported shortness of breath, 10% had nausea/vomiting, 7.5% had palpitation and 5% had sweating.

Table 4: Risk factor distribution of the participants (n=40)

Risk Factors	n	%
Family History of CAD	8	20.0%
Smoking	17	42.5%
Diabetes Mellitus	22	55.0%
Hypertension	28	70.0%
Dyslipidemia	19	47.5%

Among the participants, hypertension was the most common risk factor, observed in 70% of the participants, while 55% had diabetes mellitus, 47.5% had dyslipidemia, 42.5% had smoking as a risk factor, while 20% had a family history of cardiovascular disease.

Table 5: Distribution of the study subjects according to ECG findings (n=40)

ECG findings	n	%
LBBB	1	2.5%
Normal sinus rhythm	3	7.5%
Sinus Tachycardia	7	17.5%
ST segment depression	4	10.0%
ST segment elevation	20	50.0%
T wave changes	5	12.5%

ECG=Electrocardiography, LBBB=Left bundle branch block

50% of the participants had ST segment elevation, while 10% had ST segment depression. 17.5% had sinus tachycardia, 12.5% had T wave changes, 2.5% had blocked left bundle branch, while 7.5% had normal sinus rhythms.

Table 6: Distribution of the study subjects according to lipid profile (n=40)

Lipid profile	Mean±SD
Triglycerides (mg/dl)	212.0±52.9
Range	91.0-368.0
Total cholesterol (mg/dl)	201.8±81.8
Range (min-max)	66.0-446.0
LDL-C (mg/dl)	138.3±46.1
Range (min-max)	48.0-268.0
HDL-C (mg/dl)	39.1±6.1
Range (min-max)	29.0-49.0

The lipid profiles of various serums were recorded for the participants. It was observed that mean triglyceride levels were higher than normal at 212.0 mg/dl ±SD, total mean cholesterol was 201.8 mg/dl, which was within normal range, mean LDL-C was 138.3, which was higher than normal levels, while mean HDL-C was within normal values at 39.1 mg/dl ±SD.

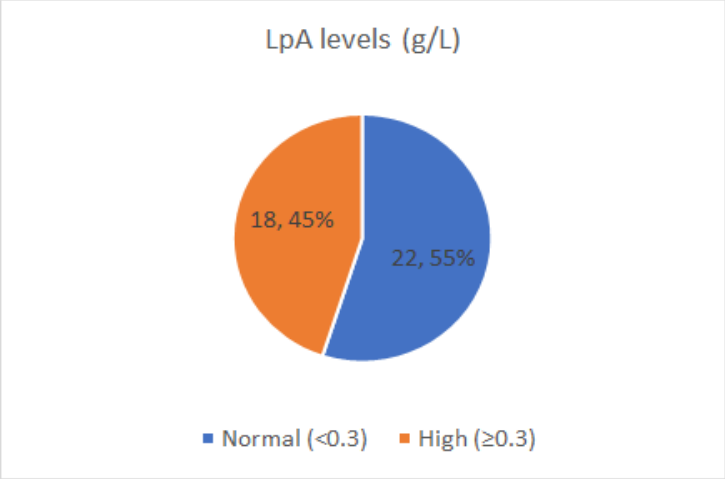

Figure 1: Pie chart shows frequency distribution of the study subject with Serum LpA level (n=40)

Serum lipoprotein (LpA) was within normal range for 55% of the participants, while 45% had high serum LpA levels.

Table 7: Distribution of the study subjects according to involvement of coronary arteries (n=40)

Number of vessels	n	%
Normal/Non critical	13	32.5%
Single vessel disease	10	25.0%
Double vessel disease	8	20.0%
Triple vessel disease	5	12.5%
Slow flow	2	5.0%
Thrombus with normal coronary	1	2.5%

Involvement of coronary arteries was normal in 32.5% of the participants, 25% had single vessel disease, 20% had double vessel diseases, 12.5% had triple vessel disease, and 5% had slow flow through the arteries, while 2.5% had thrombus with normal coronary.

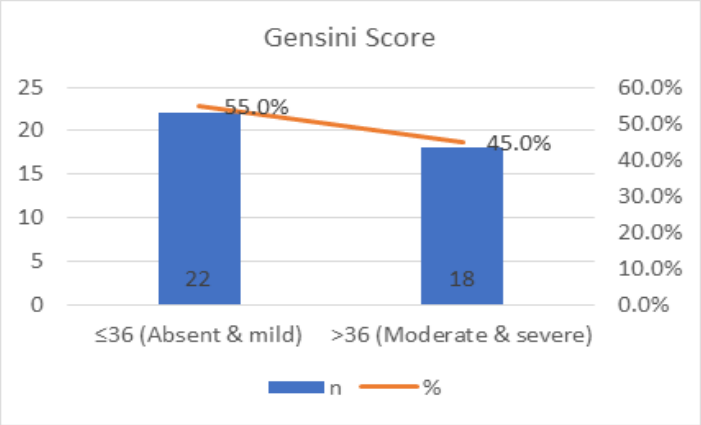

Figure 2: Distribution of the participants by Gensini scores (n=40)

According to the Gensini score of the patients, 55% had absent or mild risk of carotid stenosis, but the remaining 45% of the participants had moderate to severe risk of carotid stenosis.

DISCUSSION

Coronary artery disease is an increasingly important medical and public health problem and is the leading cause of mortality in Bangladesh. Young patients comprise 3% to 10% of all cases of acute coronary syndrome and represent an important population for study because they serve potentially to gain the most benefit in terms of risk factor modification for secondary prevention [12]. In Bangladeshi demographic, 14% of all acute coronary syndrome patients are comprised of young adults [8, 13-15]. In the present study, male prevalence was observed to be extremely high, with only 10% female prevalence. This was understandable as some habitual risk factors like smoking are more common among the male population of our country. This was supported by the findings of other studies where male female ratio was similar to our study [16]. Male sex is the worst documented risk factors for coronary atherosclerosis. On the other hand, estrogen has protective effects in preventing atherosclerosis. The distribution of the ages of our patients showed an increase of the disease with the increasing age, which was a very obvious fact. The maximum number of patients were in the age group 31-35 years. This was comparable to the findings of other studies where majority of the patients belonged to the older age groups [14, 17]. Obesity was observed in 12.5% of the present study participants, while 5% were overweight. This was different to the findings of other studies where the incidence of obesity was over 20% [8, 13-15, 18]. Obesity is generally associated with other risk factors like hypertension, dyslipidemia, diabetes, metabolic syndrome etc. These factors in turn increase the risk of various coronary problems. Among the observable risk factors of the present study participants, hypertension had the highest prevalence at 70%, followed by diabetes in 55%, dyslipidemia in 47.5% and smoking in 42.5% of the participants. Furthermore, 20% of the participants had a family history of cardiac diseases. These findings were similar to a 2002 study where dyslipidemia was observed in 63% of the participants [17]. The frequency of hypertension and diabetes was low among young patients with acute coronary syndrome under 35 years, as these risk factors are generally more common in older age groups. Hypertension and diabetes play a long term role in the atherosclerosis process and development of coronary artery disease. So, other risk factors are more important in this young age group. Depression and stress can also cause an increased risk of hypertension and heart diseases. 22.5% of the present study participants had reported mild stress during their daily lives, while 15% had moderate levels of stress. Epidemiological evidence suggests that emotional states, such as anxiety and depression have bilateral relationship in cardiovascular disease. Anxiety, depression and stressful condition cause increase stress to the heart by activation of sympathetic nervous system. On the other hand, premature acute coronary syndrome leads to development of anxiety and depression in this particular age group. Chest pain was a common clinical presentation among all the participants, however, typical chest pain was more common compared to atypical pain. Some other common presentations were shortness of breath, nausea etc. The participants had higher mean values of serum triglyceride and LDL-C compared to normal range, while HDL-C and cholesterol mean values were near normal rage. Almost half (45%) of the participants had high LpA levels.

Limitations of The Study

The study was conducted in a single hospital with a small sample size. So, the results may not represent the whole community.

CONCLUSION

The Acute coronary syndrome in young is almost exclusively seen in male. Smoking, family history of coronary artery disease, dyslipidemia, raised LpA are major risk factors.

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