

The Clinical Profile and Hospital-based Outcome of Acute Myocardial Infarction in Elderly Patients More than 60 Years and Patients Younger than 60 Years: A Comparative Study

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Abstract

Original Research Article

Background: Acute myocardial infarction refers to a pathological state characterized by the obstruction of blood supply to the myocardium, resulting in the subsequent necrosis of cardiac tissue. It constitutes a significant etiological factor contributing to the development of heart failure and global mortality rates. **Objective:** The purpose of this study was to conduct a comparative analysis of the clinical characteristics of acute myocardial infarction in old and young individuals who sought medical attention at a tertiary care hospital. **Methods:** This cross-sectional observational study was done from January 2023 to June 2023 at the Mymensingh Medical College Hospital, Mymensingh, Bangladesh. A total of 100 people were observed in this study. **Result:** We have two age groups: under 60 (60%) and over 60 (40%). We name them A and B. Group A patients are 86.7% male and 13.3% female. Group A patients are 88.3% Muslim and 7% Hindu. This patient group includes 30% service workers and 20% businesses. The remaining 28.3% were patients from diverse jobs and 1.7% were farmers. With 55% male and 45% female Muslim patients, Group B includes domestic workers (45%) and businessmen (22.5%). Service workers 17%, farmers 2.5%, and other patients 12.5%. Group A had 85% chest pain, 46.7% dyspnea, 90% palpitations, and 86.7% nausea and vomiting. Ischemic chest pain, dyspnea, palpitations, nausea, and vomiting affected 87.5% of Group B. Top MI risk factors. Group A had dyslipidemia (95%), family history of MI (93.3%), sedentary lifestyle (91.7%), smoking (88.3%), hypertension (86.7%), and diabetes (78.3%). The sedentary lifestyle, 100% family history of ischemic heart disease, 97.5% dyslipidemia, and 77.5% diabetes and hypertension characterized Group B. Lastly, our study reports patients' average pulse and blood pressure. In Group A, the average pulse was 81.73 ± 14.60 , systolic blood pressure was 129.50 ± 20.28 mmHg, and diastolic blood pressure was 89.41 ± 12.35 . Group B had an average pulse of 79.65 ± 11.55 , systolic blood pressure of 127.12 ± 19.73 mmHg, and diastolic blood pressure of 86.12 ± 11.57 mmHg. According to Figure 1, 43% of patients had complications. Arrhythmia developed in 21% of the remaining patients, and cardiogenic shock occurred in the same proportion. Only 4% of those tested positive for acute pericarditis. **Conclusion:** We compared hospital outcomes for people over and under 60. In both age categories, men predominated. Myocardial infarction is linked to a sedentary lifestyle, and chronic conditions such as diabetes, hypertension, dyslipidemia, and smoking. However, immediate admission and treatment can greatly reduce mortality in all cases.

Keywords: Coronary artery disease, Acute myocardial infarction, STEMI, dyslipidemia, hypertension, diabetes mellitus, troponin I, CK-MB.

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INTRODUCTION

Cardiovascular disease (CVD) is a major health concern that affects both developed and developing nations [1].

The risk factors influencing coronary heart disease can be categorized into uncontrollable and modifiable factors. Uncontrollable factors include age, gender, and family history, while modifiable factors include hypertension, hyperlipidemia, diabetes, and smoking. In India, the onset of Coronary Artery Disease (CAD) occurs earlier than in other populations, with a prevalence of first myocardial infarction occurring before age 40 at a rate five to ten times higher than in other populations. The occurrence of CAD is also higher in individuals from southern regions [2, 3]. Suffering a heart attack at a young age can have significant physical, psychological, and socioeconomic consequences on overall well-being. Elderly individuals with ischemic heart disease are a complex subpopulation as they are more vulnerable to comorbidities and negative outcomes compared to younger individuals [4]. Identifying key risk factors for acute myocardial infarction in both young and elderly patients is critical in developing effective preventative methods.

OBJECTIVE

The purpose of this study was to conduct a comparative analysis of the clinical characteristics of acute myocardial infarction in old and young individuals who sought medical attention at a tertiary care hospital.

METHODS

The present study was a cross-sectional observational study that analyzed patients with acute myocardial infarction who were admitted under the Department of Emergency Medicine at Mymensingh Medical College Hospital in Mymensingh, Bangladesh. The study period spanned from June 2022 to June 2023. Individuals diagnosed with both stable and unstable angina.

The subjects that met the specified inclusion criteria were analyzed. The initial clinical history, including any complications, risk factors, and previous illnesses related to acute myocardial infarction, was documented. A thorough clinical examination was subsequently conducted. Standard diagnostic tests, including pulse rate, BP, and Troponin I were conducted. Additionally, a chest x-ray, 2-dimensional echocardiogram (2-D echo), and Doppler studies were performed to assess left ventricular ejection fraction (LVEF) and identify any problems associated with myocardial infarction (MI). All patients received standard care.

The subjects were classified into two distinct groups. a. Group I consists of patients who are younger

than 60 years of age. b. Group II comprises patients who are 60 years of age or older.

The cases were monitored on the seventh day of hospital admission and one month after being discharged from the hospital to assess for potential problems.

The current study received approval from the institutional ethical committee.

Inclusion Criteria

- Typical symptoms (Chest discomfort).
- Typical pattern of ECG (ST-segment elevation of ≥ 0.1 mv in at least two consecutive leads or fresh left bundle branch block).
- Elevated enzyme levels (Troponin I, troponin T, CK-MB).

Exclusion Criteria

- Considerable valve stenosis or regurgitation (grade 2 or above)
- Past MI, non-sinus rhythm
- Serious lung disease or pathology (such as infection or pericardial effusion)

Data Collection and Analysis

The used checklist consisted of three parts. The first part included demographic data like age, sex, religion, and occupation. The second part included questions related to Symptoms, and the third part included a history of coronary diseases, a history of smoking cigarettes, the presence of dyslipidemia, diabetes mellitus and hypertension. The data were entered into the SPSS 23.

RESULTS

Table 1 shows that 60 percent of our study population was under 60 years and 40 percent of patients were above 60 years.

Table 1: Distribution of age

Age(years)	Frequency	Percentage (%)
<60	60	60.00
>60	40	40.00
Total	100	100.00

We have categorized our patients into two groups for analysis purposes, Group A comprising patients under 60 years old and Group B comprising patients above 60 years old. In Group A, 86.7% of patients are male while 13.3% are female. 88.3% of the patients in this group were Muslim while 7% were Hindu. The majority of patients (30%) were service holders, followed by 20% who were businessmen. Only 1.7% were farmers, and 28.3% were patients in other professions. On the other hand, in Group B, 55% of patients are male and 45% are female, and all of them were Muslim. The majority of patients (45.0%) were housewives, followed by 22.5% who were businessmen.

17% were service holders, only 2.5% were farmers, and 12.5% were patients in other professions.

Table 2: Different socio-demographic factors

	Group A <60 Years (n=60)		Group B >60 Years (n=40)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Sex				
Male	52	86.7	22	55.0
Female	8	13.3	18	45.0
Religion				
Islam	53	88.3	40	100.00
Hindu	7	11.7	0	0
Occupation				
Business	12	20.0	9	22.5
Service	18	30.0	7	17.5
Day labor	4	6.7	0	0
Housewife	8	13.3	18	45.0
Farmer	1	1.7	1	2.5
Others	17	28.3	5	12.5

Table 3 displays the various symptoms of myocardial infarction. Group A had 85% of patients with chest pain, 46.7% with breathlessness, 90% with palpitations, and 86.7% with nausea and vomiting. In

Group B, 87.5% had ischemic chest pain, 87.5% had breathlessness, 85% had palpitations, and 90% had nausea and vomiting.

Table 3: Different symptoms of myocardial infarction

	Group A <60 Years (n=60)		Group B >60 Years (n=40)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Ischemic type of chest pain				
Present	51	85.0	35	87.5
Absent	9	15.0	5	12.5
Breathlessness				
Present	28	46.7	35	87.5
Absent	32	53.3	5	12.5
Palpitation				
Present	54	90.0	34	85.0
Absent	6	10.0	6	15.0
Nausea & Vomiting				
Present	52	86.7	36	90.0
Absent	8	13.3	4	10.0

We discovered the top risk factors for MI in Table 4. Group A had a high prevalence of dyslipidemia (95%), positive family history of myocardial infarction (93.3%), sedentary lifestyle (91.7%), smoking (88.3%), hypertension history (86.7%), and diabetes mellitus

(78.3%). Meanwhile, Group B had a 100% positive family history of ischemic heart disease, 100% sedentary lifestyle, 97.5% dyslipidemia, and 77.5% diabetes mellitus and hypertension.

Table 4: Various risk factors of Myocardial infarction

	Group A <60 Years (n=60)		Group B >60 Years (n=40)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Smoking				
Present	53	88.3	24	60.0
Absent	7	11.7	16	40.0
Hypertension				
Present	52	86.7	31	77.5
Absent	8	13.3	9	22.5
Diabetes Mellitus				
Present	47	78.3	31	77.5

	Group A <60 Years (n=60)		Group B >60 Years (n=40)	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Smoking				
Absent	13	21.7	9	22.5
Dyslipidemia				
Present	57	95.0	39	97.5
Absent	3	5.0	1	2.5
Family history of IHD				
Present	56	93.3	40	100.0
Absent	4	6.7	0	0
Sedentary Lifestyle				
Present	55	91.7	40	100.0
Absent	5	8.3	0	0

According to Table 5, the average pulse for Group A was 81.73 ± 14.60 and the average systolic blood pressure was 129.50 ± 20.28 mmHg, with an average diastolic blood pressure of 89.41 ± 12.35 mmHg.

Additionally, Group A had an average pulse of 79.65 ± 11.55 and an average systolic blood pressure of 127.12 ± 19.73 mmHg, with an average diastolic blood pressure of 86.12 ± 11.57 mmHg.

Table 5: Mean pulse and mean systolic BP and diastolic BP

Group A <60 Years (n=60)	Mean \pm Std.
Pulse	81.73 ± 14.60
Systolic	129.50 ± 20.28
Diastolic	89.41 ± 12.35
Group B >60 Years (n=40)	Mean \pm Std.
Pulse	79.65 ± 11.55
Systolic	127.12 ± 19.73
Diastolic	86.12 ± 11.57

According to the data presented in Figure 1, it can be observed that a significant proportion of patients, specifically 43%, did not experience any sequelae. Additionally, 21% of individuals diagnosed with acute myocardial infarction developed an arrhythmia, while an

equal percentage of patients experienced cardiogenic shock. A smaller proportion, specifically 4%, exhibited symptoms of acute pericarditis. Furthermore, 9% of patients were diagnosed with mitral regurgitation and just 2% experienced thromboembolism.

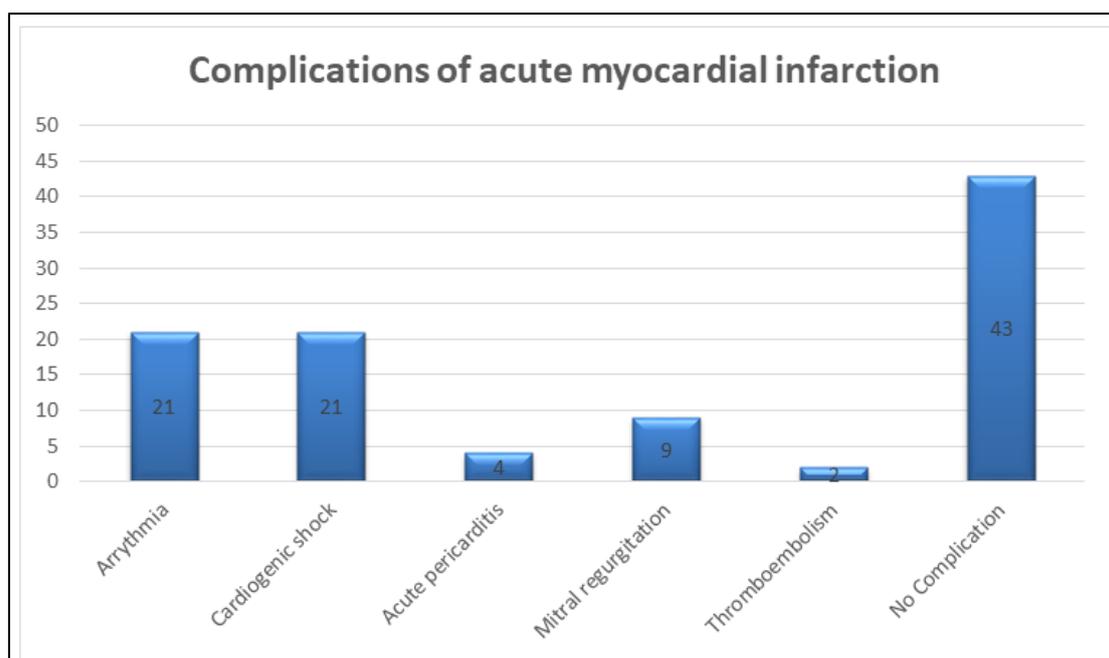


Figure 1: Complications of Acute myocardial infarction

DISCUSSION

An observational study was undertaken in Mymensingh Medical College Hospital in Mymensingh, Bangladesh, spanning from January 2023 to June 2023. Patient records and interviews were employed in this study to gather data on individuals who had experienced acute myocardial infarction (MI), using the criteria established by the World Health Organization (WHO) and the American Heart Association (AHA). The study involved the admission and evaluation of patients with confirmed acute myocardial infarction (MI) in the coronary care unit (CCU) wards.

The data shows that our study population is divided into two age groups: those under 60 years (60%) and those above 60 years (40%). We have labeled these groups as Group A and Group B, respectively. Within Group A, 86.7% of patients are male and 13.3% are female. Additionally, 88.3% of Group A patients are Muslim and 7% are Hindu. The majority of patients in this group are service holders (30%), followed by businessmen (20%). Farmers only make up 1.7% of this group, with the remaining 28.3% comprising patients in other professions. In contrast, Group B has a nearly equal gender distribution, with 55% male and 45% female patients, all of whom are Muslim. The majority of patients in this group are housewives (45%), followed by businessmen (22.5%). Service-holders make up 17%, farmers only 2.5%, and patients in other professions make up 12.5% of this group.

Table 3 outlines the various symptoms of myocardial infarction. In Group A, 85% of patients experienced chest pain, 46.7% experienced breathlessness, 90% had palpitations, and 86.7% had nausea and vomiting. In Group B, 87.5% experienced ischemic chest pain, 87.5% had breathlessness, 85% had palpitations, and 90% had nausea and vomiting.

The top risk factors for MI. In Group A, dyslipidemia (95%), positive family history of myocardial infarction (93.3%), sedentary lifestyle (91.7%), smoking (88.3%), hypertension history (86.7%), and diabetes mellitus (78.3%) were prevalent. In contrast, Group B had a 100% positive family history of ischemic heart disease, 100% sedentary lifestyle, 97.5% dyslipidemia, and 77.5% diabetes mellitus and hypertension.

Our study provides information on the patients' average pulse and blood pressure. In Group A, the average pulse was 81.73 ± 14.60 , the average systolic blood pressure was 129.50 ± 20.28 mmHg, and the average diastolic blood pressure was 89.41 ± 12.35 mmHg. Similarly, Group B had an average pulse of 79.65 ± 11.55 , an average systolic blood pressure of 127.12 ± 19.73 mmHg, and an average diastolic blood pressure of 86.12 ± 11.57 mmHg.

Figure 1 indicates that 43% of patients experienced no effects. Of the remaining patients, 21%

developed arrhythmia, and the same percentage experienced cardiogenic shock. Only 4% had symptoms of acute pericarditis.

The most often observed risk factors in young patients were current smoking, hypercholesterolemia, and family history. On the other hand, hypertension and diabetes mellitus were shown to be more prevalent among non-young patients [5]. The risk profile, clinical presentation, and severity of coronary disease in young individuals within the STEMI group exhibit notable differences compared to their elderly counterparts. The prognosis for young individuals diagnosed with ST-elevation myocardial infarction (STEMI) is more favorable as compared to older people [6]. In individuals diagnosed with diabetes who experience acute myocardial infarction, there is a higher incidence of early hospital mortality and a greater prevalence of cardiac autonomic dysfunction and microangiopathy compared to people without diabetes [7].

The presence of right ventricular involvement in elderly patients with acute inferior myocardial infarction is associated with a significantly elevated risk of mortality during hospitalization. The diminished result can be primarily attributed to the elevated prevalence of cardiogenic shock and its limited potential for reversal [8].

Research findings indicate that there exists a disparity in the administration of reperfusion therapy across genders, with women being less likely to receive this treatment compared to men. This discrepancy has been identified as a contributing factor to the inferior results experienced by women, including a higher incidence of severe myocardial necrosis. This underscores the imperative for equitable implementation of this therapeutic intervention across both sexes [9, 10]. In some studies, it has been shown that women have additional risk factors that contribute to a poorer outcome [9-11].

CONCLUSION

Our study examined hospital outcomes for patients both over and under 60 years old. In both age groups, males were found to be more prevalent. Factors such as leading a sedentary lifestyle and having chronic diseases like diabetes mellitus, hypertension, dyslipidemia, and smoking were identified as key contributors to the development of myocardial infarction. However, early hospitalization and prompt treatment can significantly reduce the mortality rate in all cases.

Abbreviations: STEMI- ST elevated myocardial infarction.

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