

## Comparison of Clinical Profile of Acute Myocardial Infarction between elderly and Young Patients Attending Tertiary Care Hospital

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### Abstract

#### Background:

Cardiovascular disease (CVD) is a global health problem that has reached epidemic levels in both industrialised and in developing nations. The objective of the research was to ascertain the disparity in the manifestation, risk factors, and potential consequences of old and young individuals diagnosed with acute myocardial infarction (AMI).

#### Materials and Methods:

This is a retrospective analysis of 50 patients who were treated for Acute ST elevation Myocardial Infarction in the Intensive Care Unit (I.C.C.U.) affiliated with the Department of Medicine at SCB MCH, Cuttack. The duration of the study lasted from October 2022 to September 2023. Group I consisted of 36 patients aged 45 years or younger, whereas Group II included 14 patients with ages beyond 45. Analysis was conducted on subjects' baseline clinical history, comorbidities, and risk factors of acute myocardial infarction (AMI). A comprehensive clinical examination and pertinent analysis were conducted. An inventory of the several problems seen upon admission was documented. Various problems were monitored with a follow-up of 07 days in hospital and 30 days following release from hospital.

#### RESULTS:

The older group with AMI consistently experienced perspiration, dyspnea, and giddiness more than the younger group. The prevalence of smoking and family history of coronary artery disease (CAD) was notably higher in Group I, while hypertension, dyslipidemia, diabetes, and obesity were considerably higher in Group II. The senior group had a notable greater occurrence of serious complications such as congestive heart failure, arrhythmias, and cerebrovascular event (72%, 56%, 14%) compared to the younger group (43%, 36%, 0%) correspondingly. In the elderly group (II) with

AMI, mortality was much higher than in the youthful group (gr I), with 10 deaths (28%) compared to 2 deaths (13%).

### **Conclusion:**

We deduce that the presentations and risk factors of acute myocardial infarction (AMI) vary between older individuals and younger individuals. The senior participants have a greater incidence of complications and death.

**Keywords:** acute myocardial infarction, elderly patients, mortality

### **INTRODUCTION**

The cardiovascular diseases (CVDs) include coronary heart disease, cerebrovascular illness, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism.

Approximately 17.9 million individuals succumbed to cardiovascular illnesses in 2019, accounting for 32% of the total worldwide mortality. Ischemic heart attacks and cerebrovascular accidents were responsible for 85 percent of these fatalities.[1]. Prominently caused by coronary artery disease (CAD), myocardial infarction (MI) is one of the most severe types of cardiovascular disease (CVD).Based on one estimate, a new occurrence of MI occurs every 40 seconds globally.[2] Among the risk factors for myocardial infarction include hypertension, diabetes, dyslipidemia, smoking, and abdominal obesity. Even little modifications may result in better results for people with many risk factors.The rising incidence of modifiable coronary artery disease (CAD) risk factors may be largely attributed to urbanization.[3] Coronary artery disease, formerly rare in those under the age of 30 before 1950 [4], is now being detected in younger people.[5] Prior research has established hypertension and diabetes as the predominant risk factors in individuals aged 45 years and above, whereas family history, smoking, and hypercholesterolemia were identified as the key risk factors in those aged 45 years or younger. [6,7] Based on a recent research, smoking and dyslipidemia are identified as the predominant risk factors in both age groups.[8] Multiple studies have shown that mortality from myocardial infarction (MI) is more prevalent in older individuals. [9-14] A recent research, however, revealed similar death rates in both young and elderly individuals, however, notably lower morbidity rates in the former group. The objective of this research was to assess the disparities in clinical characteristics, risk factors, complications, treatment, and prognosis between senior patients and young patients diagnosed with acute myocardial infarction.

#### **Materials and Methods:**

The present research is a retrospective analysis of 50 patients who were treated for Acute ST elevation Myocardial Infarction in the Intensive Care Unit (I.C.C.U.) at the Department of Medicine, SCB MCH, Cuttack. A study period spanning from October 2022 to September 2023 was conducted.The patients' case records were obtained from the hospital's medical department, and data pertinent to the cases was collected and analysed. Two groups of patients were divided based on age:

Group I consisted of patients aged 45 years and less, while

Group II included patients aged 45 years and beyond.

Comparisons were made between the two groups based on demographic information, risk factors, and clinical profile extracted from the case records.

Specialized statistical analysis was conducted using SPSS 21. Measurements of continuous and categorical variables were shown as percentages and mean±standard deviation. The Chi square statistics were used to compare the categorical variables in both groups. An acceptable level of statistical significance was defined as  $p < 0.05$ .

#### **Result:**

In present study, total 50 patients were studied. From those, less than 45 years of age were 14 (28%) while from

more than 45 years, 36 (72%) patients.

Male to female ratio was 2.1:1 as shown in Table 1.

**Table 1: Demographic characteristics of patients in the two groups**

	Group 1 ( $\leq 45$ years) (N=14)	Group II ( $>45$ years) (N=36)	Total N (%)
Male	11 (79%)	28 (78%)	39 (78%)
Female	3 (21%)	8 (22%)	11 (22%)
Mean age, years	40.27 $\pm$ 4.61	61.92 $\pm$ 10.13	59.18 $\pm$ 12.01

In the analysis of symptoms, chest Pain was predominantly seen in group I than Group II whereas sweating, dyspnoea and giddiness were observed predominantly in the group II with AMI than group I as shown in Table 2

**Table 2: Incidence of frequency of presenting symptoms of acute myocardial infarction**

Symptoms	Group 1 ( $\leq 45$ years) (N=14)	Group II ( $>45$ years) (N=36)	P value
chest pain	12 (86%)	17 (47%)	0.002*
Sweating	6 (39%)	15(43%)	0.001*
Dyspnoea	3(21%)	13(36%)	0.01*
Nausea and/or vomiting	4(29%)	12(33%)	0.02*
Giddiness	1 (7%)	6(17%)	0.002*
Syncope	1 (7%)	5(14%)	0.002*
Palpitation	1 (7%)	4(11%)	0.003*
Abdominal pain	1 (7%)	1(3%)	0.001*

\*significance.

Among the risk factors, Family history of CAD was significantly more common in younger patients than in older patients. Smoking was also significantly more common in younger patients. Diabetes, hypertension, and history of CVD were more common in the older patients as shown in Table 3.

**Table 3: Risk factors**

Risk factors	Group 1 ( $\leq 45$ years) (N=14)	Group II ( $>45$ years) (N=36)	P value
Hypertension	4(32%)	25(70%)	0.001*
Diabetes Mellitus	5(38%)	24(68%)	0.002*
smoking	7(52%)	8(23%)	0.001*
Dyslipidemias	6(43%)	10(28%)	0.02*
Cardiovascular disease	4(32%)	15(43%)	0.004*
obesity	8(60%)	23(64%)	0.01*
Family history of CAD	3(20%)	3(8%)	0.02*

\*significance

Assessment of complications of AMI at the time of hospitalization revealed that CCF, arrhythmias, CCF, cardiogenic shock, re-infarction, Cardiovascular episode (CVE) and mortality were commonly seen in group II in 7 days follow up during hospital stay as shown in Table 4.

**Table 4: Complications of Acute Myocardial Infarction**

complications	Group 1 ( $\leq 45$ years) (N=14)	Group II ( $>45$ years) (N=36)	P value
Congestive cardiac failure	6(43%)	26 (72%)	0.001*
Cardiogenic shock	1 (7%)	4 (11%)	0.002*
Reinfarction	1 (7%)	4 (11%)	0.654
Arrhythmias	5 (36%)	20 (56%)	0.213
Cardiac arrest	2 (14%)	1 (3%)	0.002*
Cerebrovascular episode (CVE)	0 (0%)	5 (14%)	0.01*
Death	02 (13%)	10 (28%)	0.001*

\*significance

## Discussion

There are specific differences in the clinical manifestation of myocardial infarction (MI) between older individuals and younger people. There exists a wide range of clinical presentations of acute myocardial infarction (MI). Within our investigation, chest discomfort emerged as the predominant clinical complaint among both the young and older patients. Previous studies conducted by Woon et

al. [15], Bhatia et al. [16], Suryadiparadja et al. [17], and Holay et al. [17] have also reported similar phenomena. [18] The results of our research indicate that older patients had a higher occurrence of symptoms such as vertigo, vomiting, and sweating compared to patients in the younger age stratum. An analogous pattern was also seen in studies carried out by Holay et al., Woon et al., and Bhatia et al. [15, 16]. [18] Increased awareness of common local abnormal manifestations would enhance our attentiveness to the potential occurrence of symptoms in the elderly that align with an acute cardiac event. Detecting acute myocardial infarction (AMI) at an early stage has the potential to enhance outcomes by implementing early intervention measures.

In our investigation, smoking emerged as the predominant risk factor among young people, whereas hypertension claimed the highest prevalence among senior persons. Concurrent trends were seen in studies carried out by Suryadiparadja et al. [17], Holay et al. [18], and Bhatia et al. [16], where smoking was identified as the predominant risk factor among younger patients, while hypertension was the most common risk factor among older individuals. The identification of the frequency of various modifiable risk factors in the two age groups might support the creation of secondary preventative measures that are customized to the unique requirements of each age group. Priority should be given to ameliorating the treatment of hypertension and diabetes mellitus in the elderly, while for the younger population, control of hyperlipidemia and smoking habits should be given equal importance alongside these disorders.

A larger incidence of congestive heart failure was seen in the old age group than in the young age group, making it the most common complication in both age groups in our research. The incidence of cardiogenic shock was very similar across both the young and old groups. Arrhythmias were less common.

Their prevalence among the elderly was 20.2% higher. In line with the results reported by Woon et al. [15], our study shown a higher incidence of heart failure consequences in the elderly compared to the younger population. Furthermore, our research did not find that cardiogenic shock was more common in older individuals with acute myocardial infarction (AMI) comparison to their younger counterparts. The study conducted by Holay et al. [18] revealed a higher incidence of cardiac failure and cardiogenic shock in the older population. 13% of younger patients succumbed to mortality in the hospital, whereas 28% of older patients died in the same setting. A research conducted by Bhatia et al. [16] showed a similar trend, with death rates of 28.04% among the elderly and 8.6% among the young. According to a research conducted by Woon et al. [15], the hospitalised mortality rates were 2.7% for young patients and 20.8% for senior patients. A like trend was seen in the study carried out by Holay et al. [18]

### **Conclusion**

Most of the patients who arrived with myocardial infarction were male and aged 45 and above. The predominant first presentation seen in both the younger and older age groups was that of chest discomfort. Unlike older patients, who had significantly higher rates of diabetes and hypertension as risk factors, younger patients were more often exposed to smoking. Moreover, they had an increased probability of having dyslipidemia and a familial predisposition to coronary artery disease (CAD). Congestive heart failure was the predominant consequence after moderate mitral regurgitation. The highest death rate was seen in elderly individuals.

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