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

Krishka Baskaran[1], Bhuvaneswari T[2], Padmasini Baskaran[3], Ashok Sampath Kumar[4]

[1]Senior Resident, Department of General Medicine, Panimalar Medical College Hospital and Research Institute, Chennai.

[2]Associate Professor, Department of Physiology, Panimalar Medical College Hospital and Research Institute, Chennai.

[3]Assistant Professor, Department of Emergency Medicine Panimalar Medical College Hospital and Research Institute, Chennai.

[4*]Assistant Professor Department of Anesthesia and critical care medicine SRM Medical College Hospital and Research Institute, Chennai

Abstract:

Background: Cardiovascular disease (CVD) is a worldwide health issue that has reached pandemic proportions in both developed and developing countries. The aim of study was to determine the difference in presentation, risk factors, & complications of elderly and young patients with acute myocardial infarction (AMI).

Materials and Methods: This is a retrospective study of 50 cases managed for Acute ST elevation Myocardial Infarction in the I.C.C.U. through the Department of Emergency Medicine, Panimalar Medical College & Hospital, Chennai. Study period was from October 2022 to September 2023. Group I comprised 36 patients who were 45 years of age or below, while Group II included 14 patients who were older than 45 years of age. Subjects were analyzed for baseline clinical history, complications, and risk factors of AMI. A detailed clinical examination and relevant investigations were done. The various complications at the time of admission were recorded. 07 days in hospital follow up and 30 days follow up after discharge from hospital was done for various complications.

Results: sweating, dyspnoea and giddiness were observed predominantly in the elderly group with AMI than younger group, Smoking and family history of CAD was significantly more in Group I, while hypertension, dyslipidemia, diabetes and obesity significant in Group II. The incidence of major complications like congestive cardiac failure, arrhythmias, cerebrovascular episode was significantly higher in the elderly group (72%, 56%, 14%) as compared to (43%, 36%, 0%) respectively in younger group. Mortality was significantly high in elderly group (II) than young (gr I) with AMI, 10 (28%) Vs 2 (13%).

Conclusion: We conclude that the manifestations & risk factors of AMI are different in elderly subjects compared to younger subjects. The elderly subjects have higher complication and mortality rate.

Keywords: acute myocardial infarction, elderly patients, mortality

Introduction

Coronary heart disease, cerebrovascular disease, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism are all classified as cardiovascular diseases (CVDs).

An estimated 17.9 million people died from cardiovascular diseases in 2019, representing 32% of all global deaths. Heart attacks and strokes accounted for 85 percent of these deaths.[1]. One of the most severe forms of cardiovascular disease (CVD), myocardial infarction (MI) is predominantly induced by coronary artery disease (CAD).According to one estimate, a new instance of MI happens every 40 seconds around the world.[2]

MI risk factors include hypertension, diabetes, dyslipidemia, smoking, and abdominal adiposity. Even minor adjustments can yield improved outcomes for patients who have a multitude of risk factors.[3] Urbanization partially accounts for the increasing prevalence of modifiable CAD risk factors.[3] Coronary artery disease, which was previously infrequent among individuals aged below 30 prior to 1950 [4], is presently being identified in younger patients.[5]

Previous studies has identified hypertension and diabetes as the most prevalent risk factors in patients aged 45 older, whereas family history, smoking, and hypercholesterolemia were found to be the most

prevalent risk factors in patients aged 45 years old or below [6,7] According to one recent study, smoking and dyslipidemia are the most common risk factors in both age groups.[8] Many studies have indicated that death from MI is higher in the elderly. [9-14] A recent study, however, found comparable mortality in the young and old, but significantly reduced morbidity in the former. [8]

The study was conducted to determine the difference in clinical features, risk factors, complications, management and outcome of elderly patients with acute myocardial infarction and young patients with acute myocardial infarction.

Materials and Methods:

This is a retrospective study of 50 cases managed for Acute ST elevation Myocardial Infarction in the I.C.C.U. through the Department of Emergency Medicine, Panimalar Medical College & Hospital, Chennai. Study period was from October 2022 to September 2023.The case notes of the patients were retrieved from the medical department of the hospital and relevant data extracted and analyzed. The patients were separated into two groups according to age:-

a. Group I - patients with age ≤ 45 years,

b. Group II - patients with age > 45 years

Demographic characteristics, risk factors, clinical profile were obtained from the cases records and compared between the two groups.

Statistical analysis was done using SPSS 21. Data of continuous & categorical variables were presented in percentage and mean±SD. categorical variables in both groups were compared by using Chi square statistics,. The statistical significance was considered 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 (≤ 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 ± 4.61	61.92 ± 10.13	59.18 ± 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 (≤ 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 (≤ 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 (≤ 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 numerous distinctions between the clinical presentation of MI in elderly patients and younger patients. There is a vast array of clinical manifestations of acute MI. In our study, chest pain was the most prevalent clinical symptom among both young and elderly participants. Other researchers, including Woon et al. [15], Bhatia et al. [16], Suryadiparadja et al. [17], and Holay et al. [17], also observed this phenomenon. [18] Our study found that elderly patients exhibited a greater prevalence of symptoms such as vertigo, vomiting, and sweating in comparison to patients in the younger age group. This trend was also observed in research conducted by Holay et al., Woon et al., and Bhatia et al. [15, 16]. [18] Familiarity with prevalent local atypical presentations would heighten our vigilance in regard to the possibility that the elderly are exhibiting symptoms consistent with an acute cardiac event. Early detection of AMI may potentially lead to improved outcomes through the implementation of early intervention strategies.

Smoking was the most prevalent risk factor among young adults in our study, whereas hypertension was the most prevalent risk factor among elderly individuals. Analogous patterns were observed in research conducted by Suryadiparadja et al. [17], Holay et al. [18], and Bhatia et al. [16], wherein smoking emerged as the prevailing risk factor among younger patients, while hypertension was the most prevalent risk factor among the elderly. Determining the prevalence of diverse modifiable risk factors within the two age cohorts could facilitate the development of secondary preventive initiatives that are tailored to the specific needs of each age group. Greater emphasis should be placed on improved management of hypertension and diabetes mellitus among the elderly, whereas for the younger population, control of hyperlipidemia and smoking habits should be prioritized in addition to these conditions.

In our study, congestive cardiac failure was the most prevalent complication in both age categories, with a higher incidence in the elderly age group than in the young age group. The occurrence of cardiogenic shock was virtually identical between the young and elderly populations. Arrhythmias were a less frequent complication among the young (20.2%) than they were among the elderly (20.2%). Consistent with the findings of Woon et al. [15], complications of cardiac failure were more prevalent in the elderly than in our study, whereas they were significantly lower in the young. Additionally, cardiogenic shock was more prevalent in elderly AMI patients than in their younger counterparts, which was not the case in our study. Holay et al. [18] found that cardiac failure and cardiogenic shock occurred more frequently in the elderly. 13% of younger patients died in the hospital where as 28% of elderly patients died in the hospital. A similar pattern was observed in a study by Bhatia et al. [16], which reported mortality rates of 28.04% among the elderly and 8.6% among the young. A study by Woon et al. [15] found that youthful patients (2.7%) and elderly patients (20.8%) died in the hospital. An analogous pattern was documented in the research conducted by Holay et al. [18]

Conclusion

The majority of myocardial infarction patients who presented were over the age of 45 and male. The prevailing initial manifestation observed in both the younger and elder age cohorts was chest pain. In contrast to elderly patients, where diabetes and hypertension were the most prevalent risk factors, younger patients were most frequently exposed to smoking. Additionally, they had a higher likelihood of, having dyslipidemia, and having a family history of CAD. Following mild mitral regurgitation, congestive heart failure constituted the prevailing complications. The mortality rate was predominant among older patients

References

1. Cardiovascular diseases. WHO. 2017.<https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)>.
2. Benjamin EJ, Muntner P, Alonso A, Bittencourt MS, Callaway CW, Carson AP, et al. Heart disease and stroke statistics - 2019 update: a report from the American Heart Association. Circulation. 2019; 139: e56-e-528.
3. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, et al. Eff ect of potentially

modifi able risk factors associated with myocardial infarction in 52 countries (the INTER-HEART study): case-control study. Lancet. 2004; 364(9438): 937-952.

4. KAPLAN AS. Acute myocardial infarction in patients thirty-fi ve years of age and under. Diseases Chest. 1967; 51(2): 137–147.

5. Jneid H, Fonarow GC, Cannon CP, Hernandez AF, Palacios IF, Maree AO, et al. Sex diff erences in medical care and early death aft er acute myocardial infarction. Circulation. 2008; 118(25): 2803-2810.

6. Garoufalis S, Kouvaras G, Vitsias G, Perdikouris K, Markatou P, Hatzisavas J, et al. Comparison of angiographic fi ndings, risk factors, and long-term follow-up between young and old patients with a history of myocardial infarction. Int J Cardiol. 1998; 67(1): 75-80.

7. Shiraishi J, Kohno Y, Yamaguchi S, Arihara M, Hadase M, Hyogo M, et al. Acute myocardial infarction in young Japanese adults. Circulation J. 2005; 69(12): 1454-1458.

8. Asl AA, Sepasi F, Toufan M. Risk factors, clinical manifestations and outcome of acute myocardial infarction in young patients. J Cardiovasc Th orac Res. 2010; 2(1): 29- 34.

9. Tresch DD, Brady WJ, Aufderheide TP, Lawrence SW, Williams KJ. Comparison of elderly and younger patients with out-of-hospital chest pain. Arch Intern Med. 1996; 156(10): 1089-1093.

10. Wang SW, Ren GC, Shio SF, Yu SY, Zhen FY. Acute myocardial infarction in elderly Chinese. A clinical analysis of 631 cases and comparison with 389 younger cases. Jpn Heart J. 1988; 29(3): 301-307.

11. Day JJ, Bayer AJ, Pathy MS, Chadha JS. Acute myocardial infarction: diagnostic diffculties and outcome in advanced old age. Age Ageing. 1987; 16(4): 239-243.

12. Yang XS, Willems JL, Pardaens J, De Geest H. Acute myocardial infarction in the very elderly. A comparison with younger age groups. Acta Cardiol. 1987; 42(1): 59-68.

13. Paul SD, O'Gara PT, Mahjoub ZA, DiSalvo TG, O'Donnell CJ, Newell JB, et al. Geriatric patients with acute myocardial infarction: cardiac risk factor profi les, presentation, thrombolysis, coronary interventions, and prognosis. Am Heart J. 1996; 131(4): 710-715.

14. Mehta RH, Rathore SS, Radford MJ, Wang Y, Wang Y, Krumholz HM. Acute myocardial infarction in the elderly: diff erences by age. J Am Coll Cardiol. 2001; 38(3): 736-741.

15. V C Woon, K H Lim. Acute Myocardial Infarction in the Elderly, the Differences Compared with the Young. Singapore Med J. 2003; 44(8):414-418.

16. Lovleen C. Bhatia a, Ruchi H. Naik b. Clinical profile of acute myocardial infarction in elderly patients.Journal of Cardiovascular Disease Research.2013;(4) 107e111.

17. Miftah Suryadipradja, Wahyu Dewabrata, S. Harun, Idrus Alwi, Lukman Hakim, Shufrie Effendy, Dasnan Isamail. Clinical Manifestation of Acute Myocardial Infarction in the Elderly. Med J Indones. 2003; 12(4):229-235.

18. MP Holay, A Janbandhu, A Javahirani, MS Pandharipande, SD Suryawansh. Clinical Profile of Acute Myocardial Infarction in Elderly (Prospective Study). JAPI. 2007;(55):188-192.