

Clinical Profile and Risk Factors of Acute ST-elevation Myocardial Infarction in Elderly Population

G Kannan¹, A Ramalingam²

¹Assistant Professor, Department of Medicine, ESIC Medical College and PGIMSRR, Chennai, Tamil Nadu, India, ²Associate Professor, Department of Medicine, Stanley Medical College, Chennai, Tamil Nadu, India

Abstract

Background: Cardiovascular disorders are the leading cause of death worldwide, and they are prevalent in both developed and developing countries. This study aims to determine the clinical profile of 60 cases of ST-elevation myocardial infarction (STEMI) in elderly aged 65 and above and analyze the risk factors of STEMI.

Materials and Methods: This study was conducted from June 2009 to November 2009 period in Government Stanley Medical College and Hospital. Sixty consecutive patients of age 65 and above admitted to the coronary care unit with a diagnosis of acute STEMI were included in the study. Special emphasis was made on presenting complaints, risk factors, comorbidities, vital signs, and arrhythmias. The patients' clinical profile, including age, sex, presenting symptoms and their duration, clinical signs, and risk factors associated with STEMI, was documented and analyzed.

Results: Maximum number of cases (25/60) was in the age group of 65–69 years. Females 53% were predominant as compared to males 47%. The most common clinical symptom was chest pain (92%), followed by dyspnea 48% and sweating 43%. The most common risk factor found in this study was smoking, which was seen in 33% of the cases, followed by diabetes mellitus in 25%.

Conclusion: The incidence of STEMI in elderly 65 years and above is more common in females, the difference being high as the age advances. Even though chest pain is the most common presentation, atypical presentation without chest pain is also high. Tachypnea and tachycardia are the most commonly observed signs and smoking is the most common risk factor, followed by diabetes mellitus.

Key words: Arrhythmia, Cardiac ischemia, Dyspnea, Elderly, Myocardial infarction

INTRODUCTION

The diagnosis and management of ischemic heart disease in the elderly are an increasingly frequent challenge. The elderly constitute the most rapidly growing segment of our society. They represent a much larger proportion of cardiac disease patients treated in a hospital or a physician's office.^[1] In the elderly, ischemic disease itself is responsible for over one-half of the deaths and the vast majority of congestive heart failure and cardiac disability patients.

Age-related cardiac function and structure changes are well described in normal man and the mechanisms responsible for these are explored in animal models of aging. The most important of these are prolonged contraction and relaxation and a diminished response to β -adrenergic sympathetic stimulation.^[2]

Prolonged relaxation as evidenced by a decrease in the slope of early mitral valve closure on M-mode echocardiography, a decrease in peak filling rate and an increase in the time to peak filling rate on radionuclide angiography studies, and an increase in Doppler indices of atrial contribution to the left ventricular (LV) filling.^[3] Prolonged contraction and delayed relaxation properties may also be related to physical conditioning status and endocrine function, as exercise protocols and thyroid hormone administration reverse some of these age-related changes. These changes may alter presenting symptoms in patients with

Access this article online



www.ijss-sn.com

Month of Submission : 01-2021
Month of Peer Review : 01-2021
Month of Acceptance : 02-2021
Month of Publishing : 03-2021

Corresponding Author: Dr. G Kannan, Department of Medicine, ESIC Medical College and PGIMSRR, Chennai, Tamil Nadu, India.

ischemic disease. Ischemia, similar to aging, alters diastolic properties to increase end-diastolic pressure for any given volume.^[4] Therefore, older individuals may be more likely than younger patients to experience dyspnoeic symptoms for any given ischemic or tachycardic insult. Decreased dependence on sympathetic-induced cardiovascular changes to mediate an exercise response suggests that β -adrenergic blockers may be less effective anti-ischemic agents during exercise in older population.^[5]

Although the significance of risk factors for the development of the coronary disease is well recognized in the younger and middle-aged groups, the importance of risk factor management in the elderly is sometimes debated. This study aims to study the clinical profile of 60 cases of ST-elevation myocardial infarction (STEMI) in elderly aged 65 and above and analyze the risk factors of STEMI.

Aim

The aim of the study was to study the clinical profile of 60 cases of STEMI in elderly aged 65 and above and analyze the risk factors of STEMI.

MATERIALS AND METHODS

This study was conducted from June 2009 to November 2009 period in Government Stanley Medical College and Hospital. Sixty consecutive patients of age 65 and above admitted to the coronary care unit with a diagnosis of acute STEMI were included in the study. All patients included in the study were subjected to electrocardiogram (ECG) examination with conventional 12 leads and V3R, V4R, V7 to V9. Rhythm strips were taken in patients with arrhythmia. All the patients were assessed clinically and electrocardiographically to make a diagnosis of STEMI. Special emphasis was made on presenting complaints, risk factors, comorbidities, vital signs, and arrhythmias. All patients were followed up till death or discharge. Pre-discharge ECHO was done to assess the LV function. Patients with age <65 and patients with Non-STEMI, unstable angina, and Recurrent myocardial infarction (MI) were excluded from the study. The patients' clinical profile, including age, sex, presenting symptoms and their duration, clinical signs, and risk factors associated with STEMI, was documented and analyzed.

RESULTS

The study comprised 60 cases of acute STEMI aged 65 years and above. Cases were divided into groups of 5 years difference for comparing age and sex incidence. Incidence in male and female was almost equal in the age group 65–74 Table 1. The incidence is increased in females in the age group 75 and above. The highest age was a female

with 85 years old. 32 patients (53%) were females and 28 (47%) were males, Figure 1.

Chest pain, dyspnea, sweating, palpitation, vomiting, and syncope were the common symptoms experienced by patients in our study. About 92% of the patients had chest pain, followed by dyspnea seen in 48% of the patients. About 10% of the patients who did not have chest pain had dyspnea as their presenting complaint Figure 2. Sweating and palpitations were present in 43% and 30% of the patients, respectively.

Radiation of chest pain was noticed in 36 patients (60%). Radiation to the left upper limb was seen in 24 patients (40%), six patients had radiation to the epigastrium (10%), and another three patients (5%) had radiation to right upper limb. Other sites of radiation in three patients (5%) Figure 3.

The time duration from the onset of symptoms and patient reaching the hospital was noted. Sixteen patients (26%) presented after 24 h. Forty-four patients presented within 24 h. Among them, only 17 patients (29%) reached the hospital within 6 h Table 2.

Table 1: Age distribution

Age	No. of patients n=60	Percent	Male	Female
65–69	25	42	14	11
70–74	17	28	8	9
75–79	8	13	3	5
80–84	9	15	3	6
85 and above	1	2	0	1

Table 2: Duration of symptoms

Time	No. of patients	%
0–6 h	17	29
6–12 h	27	45
>12 h	16	26

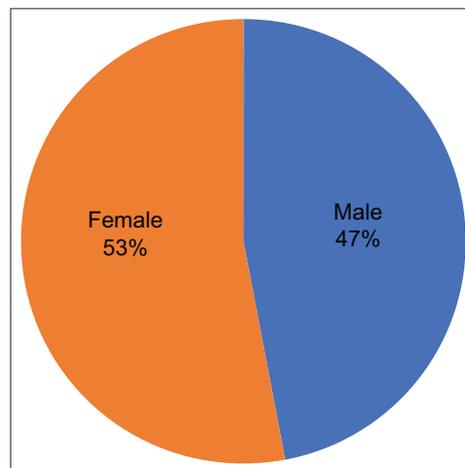


Figure 1: Sex distribution

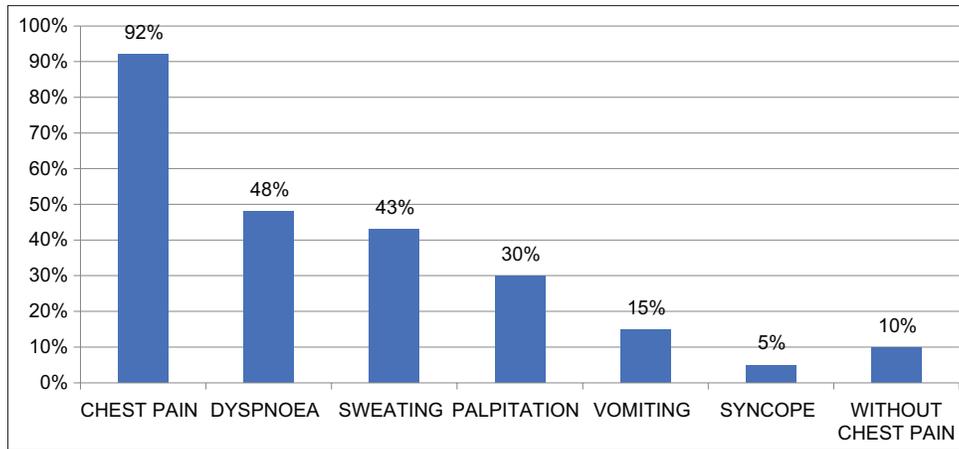


Figure 2: Presenting symptoms

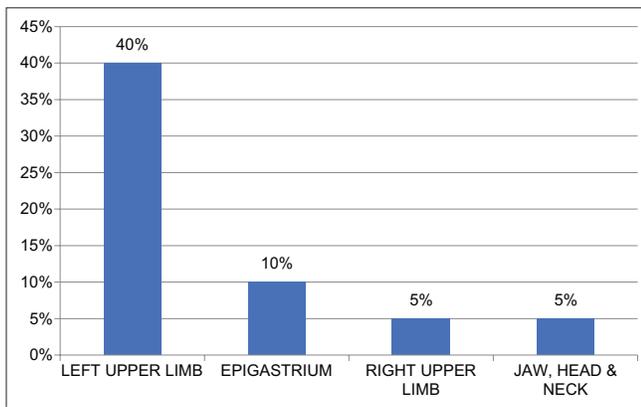


Figure 3: Radiation of chest pain

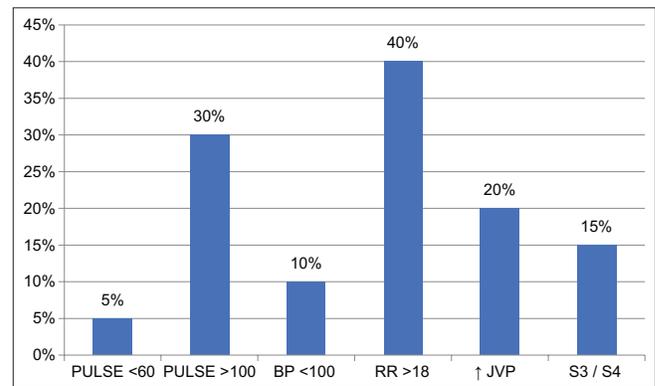


Figure 4: Clinical signs

Tachypnea was the most common clinical sign observed in 24 patients (40%). Three patients (5%) had bradycardia and tachycardia was seen in 18 patients (30%). Hypotension was noticed in six patients (10%). Twelve patients (20%) had raised jugular vein pressure. Third or fourth heart sound was detected in ten patients (15%) Figure 4.

Risk factor assessment showed that 33% of the patients had smoking habit and it is the main risk factor leading up to MI, according to our study. Out of 28 males, 20 were smokers. None of the female patients was smokers. All the smokers were smoking 10–20 beedies/cigarettes per day for at least 10 years. About 60% of them were current smokers.

This was followed by diabetes mellitus (25%) and all of them were on oral hypoglycemic agents. An attempt was made to go through the earlier medical records wherever available. Patients were considered to be hypertensive if they had been told to have hypertension earlier by a doctor and put on antihypertensive drugs or serial BP recordings in the hospital were consistently high. Thirteen patients had hypertension (22%).

Out of 28 males, 12 were in the habit of consuming alcohol. None of the female patients was in the habit of consuming alcohol. Dyslipidemia and obesity were present in 5% of each of the patients Figure 5.

DISCUSSION

Sixty proven cases of acute STEMI of age 65 and above were selected for analyzing the various risk factors, clinical features, and complications. All patients were subjected to ECG examination of conventional 12 leads, V3R V4 R and V7V8V9 and rhythm strip wherever needed. On analyzing the incidence, it was found that STEMI in the elderly is slightly more in our study (53% – females and 47% – males). It is a contrast with middle age, where MI is more common in males. Hence, with aging, the incidence of MI is likely to have an equal gender distribution.

About 92% of the patients presented with chest pain as their chief symptom in our study. All of them had typical retrosternal chest pain lasting for more than 30 min. Most of the patients developed chest pain while at rest. Mahajan *et al.*, in their study among 160 ischemic patients, also

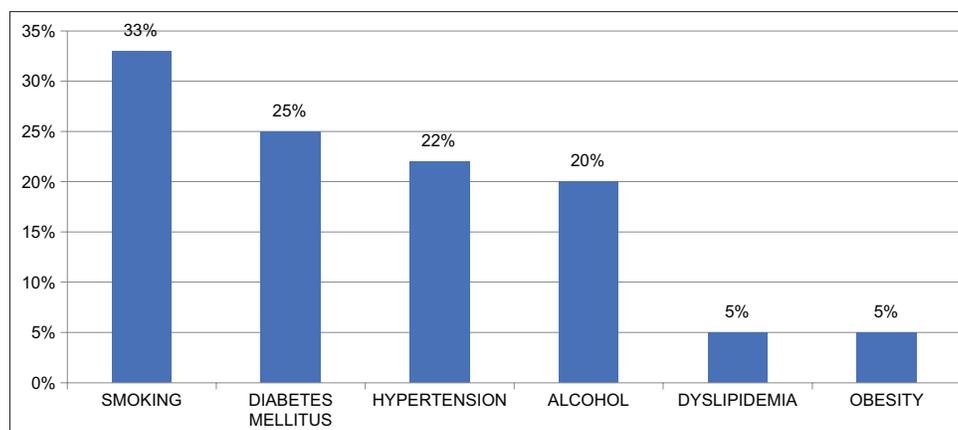


Figure 5: Risk factors of myocardial infarction

showed that chest pain was the most common presenting symptom present in 100% of the patients.^[6] When analyzing symptoms other than chest pain, Dyspnea was observed in 48% of patients. This points out that the elderly tend to have more dyspnea than the younger for compromised cardiovascular status. Bhatia *et al.* encountered in their study that dyspnea was more common in the elderly.^[7]

Patients who presented without chest pain were around 10%. These patients had either dyspnea or syncope, as reported by our study findings. These kinds of observations were well recognized. Atypical presentation in the Framingham study is around 30% in males aged 75–84 years compared with only 5% in men aged 45–54.^[8] On analyzing the duration of symptoms, that is, the time taken from the start of symptoms and to reach the hospital, only 74% reached the hospital within 12 h. This is the window period where thrombolysis is effective and myocardium could be salvaged. About 26% of patients presented late and not eligible for thrombolytic therapy. Rajagopalan *et al.* in their study, found that age >65 years independently predicted late presentation.^[9]

On analyzing MI's risk factors, smoking (33%) was the most common and exclusively seen in males. None of the females was smokers. In common to both males and females, diabetes is the leading risk factor observed in 25%. Hypertension and dyslipidemia were observed in 22% and 5%, respectively. All dyslipidemics were found to be coexisting with diabetes. Obesity was not observed significantly (around 5%). On analyzing the clinical presentation, the most observed signs were tachypnea and tachycardia, 40% and 30%, respectively. Bueno *et al.*, in their studies, had analyzed the incidence of risk factors. He had found hypertension in 45%, diabetes mellitus in 23%, smoking in 63%, obesity in 22%, and dyslipidemia in 25%.^[10]

CONCLUSION

The incidence of STEMI in elderly 65 years and above is more common in females, the difference being high as the age advances. Even though chest pain is the most common presentation, atypical presentation without chest pain is also high. Delayed presentation is common among the elderly. Tachypnea and tachycardia are the most commonly observed signs and smoking is the most common risk factor, followed by diabetes mellitus. Patients without any conventional risk factors were 30%.

REFERENCES

- White H, Barbash GI, Califf RM, Simes RJ, Granger CB, Weaver WD, *et al.* Age and outcome with contemporary thrombolytic therapy: Results from the GUSTO trial. *Circulation* 1996;94:1826-33.
- Pathy MS. Clinical presentation of myocardial infarction in the elderly. *Br Heart J* 1967;29:190-9.
- Bayer AJ, Chandha JS, Farag RR, Pathy MS. Changing presentation of myocardial infarction with increasing age. *J Am Geriatr Soc* 1986;34:263-6.
- Tresch DD, Brady WJ, Aufderheide TP, Lawrence SW, Williams KJ. Comparison of elderly and younger patients with out-of-hospital chest pain-clinical characteristics, acute myocardial infarction, therapy and outcomes. *Arch Intern Med* 1996;156:1089-93.
- George E, Savitha D, Pais P. Pre-hospital issues in acute myocardial infarction. *JAPI* 2001;49:8-12.
- Mahajan DD, Baghel RS, Nagdeve RN. Clinical profile and risk factors associated with acute myocardial infarction. *Int J Biomed Adv Res* 2019;10:e5234.
- Bhatia LC, Naik RH. Clinical profile of acute myocardial infarction in elderly patients. *J Cardiovasc Dis Res* 2013;4:107-11.
- Wilson PW, Abbott RD, Castelli WP. High density lipoprotein cholesterol and mortality. The Framingham heart study. *Arteriosclerosis* 1988;8:737-41.
- Rajagopalan RE, Chandrasekhar S, Pai M, Rajaram R, Mahendran S. Pre-hospital delay in acute myocardial infarction in an urban Indian hospital: A prospective study. *Natl Med J India* 2001;14:8-12.
- Rossello X, Bueno H, Pocock SJ, van de Werf F, Danchin N, Annemans L, *et al.* Predictors of all-cause mortality and ischemic events within and beyond 1 year after an acute coronary syndrome: Results from the EPICOR registry. *Clin Cardiol* 2019;42:111-9.

How to cite this article: Kannan G, Ramalingam A. Clinical Profile and Risk Factors of Acute ST-elevation Myocardial Infarction in Elderly Population. *Int J Sci Stud* 2021;8(12):145-148.

Source of Support: Nil, **Conflicts of Interest:** None declared.