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PROFILE OF PATIENTS WITH ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION - A HOSPITAL BASED STUDY IN NORTH KARNATAKA.

Medicine

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ABSTRACT

Background The treatment in ST elevation myocardial infarction primarily has been to restore normal blood flow in the occluded coronary artery as quickly as possible. Previous studies have shown an association between resolution of ST elevation after thrombolysis and improved coronary patency and clinical outcome. **Aims And Objectives** This study aims to study the profile of the patients presenting with acute ST-segment elevation myocardial infarction A total of 60 patients with diagnosis of acute ST segment elevation myocardial infarction in Al Ameen Medical College. **Results And Conclusion** In this study, chest pain (95%) was the most common presentation. Smoking was the most common risk factor seen in 55% of study population. 19 of 41 (46.3%) patients had complete resolution in this age group. Only 5 of 26 patients thrombolyzed between 6-12 hours of symptom onset. Preventive measures may be more effective if they are taken in the second and third decade of life.

KEYWORDS

Patient Profile of CAD, Myocardial Infarction, Killip Classification, Thrombolysis.

INTRODUCTION

Acute myocardial infarction (AMI) is one of the major factors affecting the mortality and morbidity in the developed world [1]. It is one of the major public health concerns in the industrialized world and it is gradually becoming a most important cause of mortality in developing countries. Various factors such as dietary and lifestyle changes, industrialization and urbanization are influencing the epidemiology of acute myocardial infarction. Currently, India has the highest burden of acute coronary syndrome and ST-elevation myocardial infarction (STEMI). In addition, other cardiovascular diseases (CVD's), like hypertensive heart diseases add to the burden. Indians are at risk of getting hospitalized 2–4 times more frequently for complications of coronary artery disease (CAD), in comparison with other ethnic groups, and hospital admission rates are 5–10 times higher for populations younger than 40 years[2]. Total prevalence of CAD is 37/1000 population with 64.37 and 24.27 per 1000 in urban and rural population respectively. In urban areas the pooled estimate was 61% for males and 67% for females. In rural areas the estimate was 21% for males and 27% for females [3]. The Global Burden of Disease study found that, in India, the age-standardized CVD death rate was 272 per 100000 population, which is much higher than that of global average of 235. CVD affects Indian population almost ten years earlier than the western population [4].

Studies have shown an association between each resolution of ST elevation after thrombolysis and improved coronary patency and clinical outcome [5]. Most of the centres in India, thrombolysis by using intravenous streptokinase is the mainstay of treating ST segment elevation myocardial infarction (STEMI) [6- 8]. Present study is designed to analyze the patient profile with acute STEMI and comparing their ECG findings on admission during hospital stay.

AIMS AND OBJECTIVES

1. To study the profile of the patients presenting with acute st-segment elevation myocardial infarction

METHODOLOGY

The present study is a hospital based cross sectional study. A total of 60 patients with diagnosis of acute ST segment elevation myocardial infarction according to ACC/AHA guidelines 2018[9], were included in the study who admitted to Internal medicine/ Cardiology department of Al Ameen Medical college, Vijayapura were selected for the study, the study period was from March 2021 to September 2022. After taking intuitional ethical clearance, all the patients with ST segment elevation myocardial infarction for the first time, diagnosed according to ACC/AHA guidelines 2018[9] without any conventional contraindications for thrombolysis before 12 hours of onset of symptoms were included in the study. Patients with previous history of acute myocardial infarction, patients coming to hospital after 12 hours of onset of symptoms, those with conventional contraindications for thrombolytic therapy and patients with previous history of valvular heart disease, cardiomyopathy and congenital heart disease were excluded from the study. If patient expired before 90 minutes after thrombolytic therapy or if there was Bundle branch block or patients with other causes of ST segment elevation were excluded.

Sample Size

In-hospital mortality was seen in 10% of patients. Mortality incidence was in accordance to study of Misiriya KJ et al [10], the sample size of 60, was calculated using open epi 2.3.1 software using the formula, n = [DEFF*Np(1-p)]/ [(d2/Z21-α/2*(N-1)+p*(1-p)] , with 90% confidence interval and confidence limit of 7%.

Data Collection

Data was collected in a pre-tested proforma where detailed history, physical examination, thorough cardiovascular and other systems examination and necessary investigations recorded. A detailed case history was taken in every patient who fulfilled the criteria for thrombolysis and a meticulous examination was done as per proforma and relevant investigations were done and thrombolytic agent (i.v. streptokinase) was administered. A 16 lead ECG consisting of 12 conventional leads and 4 right sided chest leads was recorded at the time of admission, 90 minutes after the thrombolysis, everyday subsequently for 7 days/hospital stay. Standard lead II was used to monitor and record rhythm disturbances. The other investigations to which patients were subjected were complete hemogram, ESR, Urine-albumin, sugar, microscopy, FBS, PPBS. Fasting lipid profile, Blood urea, Serum creatinine, Serum electrolytes, CPK-MB, Trop-I, Chest X ray, Echocardiogram. ST segment elevation was measured 80 millisecond after the J point.

The summed ST segment elevation was measured by summing the ST segment amplitude in all leads. With ST elevation at base line ECG (before thrombolysis) and at 90 min ECG (post thrombolysis) using methods described by Schroder et al[11]. Percentage resolution of ST segment was calculated as the sum of ST segment elevation on first ECG minus the sum of ST segment elevation on second ECG, divided by initial sum of ST segment elevation. Based on percentage ST segment resolution, study population was divided into three categories: A, B and C. Category A: < 30% resolution of the sum of ST segment elevation. Category B: 30% - 70% resolution of the sum of ST segment elevation. Category C: > 70% resolution of the sum of ST segment elevation. Clinical details were recorded prospectively. In the hospital, major adverse events defined as the occurrence of any of the following. Killip Class II–IV, Left ventricular failure, cardiogenic shock, recurrent angina, significant arrhythmias.

Statistical Analysis

The continuous variable such as age was expressed in terms of mean ± standard deviation, as calculated using Microsoft Excel 2007. The statistical significance of the observations was determined by calculation of p value using Chi-square test. The statistical analysis was done using SPSS 19.0 software. A p value of <0.05 was taken as statistically significant.

RESULTS

Table no. 1, showing the age group, gender, symptoms and Risk factors.

Age group (years)	Number of cases (N = 60)	Percentage (100 %)
26-45	15	25.0
46-65	41	68.3
66-85	04	06.7
Sex	Number of cases (N = 60)	Percentage (100 %)
Male	48	80
Female	12	20
Symptoms	Number of cases (N = 60)	Percentage
Chest pain	57	95.0
Sweating	46	76.7
Dyspnea	09	15.0
Palpitation	03	05.0
Syncope	11	18.3
Nausea/Vomiting	27	45.0
Risk factors	Number of cases (N = 60)	Percentage (%)
Smoking	33	55.0
Hypertension	28	46.7
Diabetes Mellitus	22	36.7
Hyperlipidemia	6	10.0
Family History	14	23.3

Table no. 2, showing the Type of infarction, Time interval, Segment resolution and Killip Class among the study subjects.

Type of infarction	Number of cases (N = 60)	Percentage (%)
Anterior wall MI	40	66.7
Inferior wall MI	20	33.3
Time interval	Number of cases (N = 60)	Percentage (%)
< 6 hours	34	56.7
6-12 hours	26	43.3
ST segment resolution	Number of cases (N = 60)	Percentage (%)
Category A (<30%)	10	16.7
Category B (30-70%)	27	45.0
Category C (>70%)	23	38.3
Killip Class	Number of cases (N = 60)	Percentage (%)
I	31	51.7
II	22	36.7
III	5	08.3
IV	2	03.3

Table no. 3: showing distribution of Age group, Gender, Type of MI, Thrombolysis time and Killip class in each category

Age group (years)	Category A 10 (16.7%)	Category B 27 (45.0%)	Category C 23 (38.3%)	Total 60 (100%)
26-45	02 (20.0)	09 (33.3)	04 (17.4)	15 (25.0)
46-65	05 (50.0)	17 (63.0)	19 (82.6)	41 (68.3)
66-85	03 (30.0)	01 (03.7)	00 (00.0)	04 (06.7)
Sex	Category A 10 (16.7%)	Category B 27 (45.0%)	Category C 23 (38.3%)	Total 60 (100%)
Male	7 (70.0)	23 (85.2)	18 (78.3)	48 (80.0)
Female	3 (30.0)	04 (14.8)	05 (21.7)	12 (20.0)
Type	Category A 10 (16.7%)	Category B 27 (45.0%)	Category C 23 (38.3%)	Total 60 (100%)
AWMI	08 (80.0)	22 (81.5)	10 (43.5)	40 (66.7)
IWMI	02 (20.0)	05 (18.5)	13 (56.5)	20 (33.3)
$\chi^2 = 9.032$, df = 2 , p = 0.01				
Thrombolysis time	Category A 10 (16.7%)	Category B 27 (45.0%)	Category C 23 (38.3%)	Total 60 (100%)
< 6 hours	04 (40.0)	12 (44.4)	18 (78.3)	34 (56.7)
6-12 hours	06 (60.0)	15 (55.6)	05 (21.7)	26 (43.3)
$\chi^2 = 7.141$, df = 2, p = 0.028				
Killip Class	Category A 10 (16.7%)	Category B 27 (45.0%)	Category C 23 (38.3%)	Total 60 (100%)
I	01 (10.0)	13 (48.2)	17 (73.9)	31 (51.7)
II	04 (40.0)	12 (44.4)	06 (26.1)	22 (36.7)
III	03 (30.0)	02 (07.4)	00 (00.0)	05 (08.3)
IV	02 (20.0)	00 (00.0)	00 (00.0)	02 (03.3)
$\chi^2 = 24.38$, df = 6, p = 0.0004				

Chi-square test was used and p value less than 0.05 was considered statistically significant**.**

DISCUSSION

In this present study, the minimum age was 26 years and maximum age was 82 years. Maximum numbers of patients were in age group 46-65 years (68.3%). Mean age in the present study was 52.8 years, mean age was lesser to the studies of Schroder et al.[11], French et al [12], Dong et al [13] which were based on western population, suggesting early onset CAD in the study population. But Gender distribution showed male preponderance, 80% were males and 20% were females. M : F ratio was 4:1. Similar observations in gender distribution were documented in the study done by Schroder et al.[11], French et al.[12], Dong et al.[13], Misiriya KJ et al[10].

In this study, chest pain (95%) was the most common presentation, followed by sweating (76.7%) and nausea / vomiting (45%). Lesser presenting complaints were syncope and dyspnea seen in 18.3% and 15% respectively and palpitations in 5% of patients. Smoking was the most common risk factor seen in 55% of study population. Hypertension (46.7%) and diabetes mellitus (36.7%) were other common risk factors. Family history of IHD was positive in 23.3% and hyperlipidemia in 10% of patients (Table no. 1). The percentage of smokers in our study was higher than similar studies of French et al.[12], Dong et al[13]. It is one of the most common modifiable risk factors. Various studies have shown association of diabetes mellitus and CAD. H /o Diabetes mellitus (DM) is present in 15 of 50 cases (30%) of this study. Present study showed higher incidence of diabetes mellitus in patients than similar study done by French et al.[12], Dong et al.[13], Misiriya KJ et al[10], Bhatial et al[14], probably due to higher prevalence in India.

In the present study anterior wall MI (66.7%) was more common than inferior wall MI (33.3%). 56.7% of patients were thrombolyzed within 6 hours of onset of symptoms and 43.3% in between 6-12 hours. Majority of patients at presentation were in class I (51.7%) and class II (36.7%) in the present study. Complete ST resolution [Category C] was seen in 38.3%, partial resolution [Category B] in 45% and no resolution [Category A] in 16.7%. Majority of patients were in the age group between 46-65 years (68.3%). 19 of 41 (46.3%) patients had complete resolution in this age group. Only 6.7% were in the age group 66-85 years and 3 of 4 among 66-85 years age group did not had resolution (Table no.2 and Table no. 3)**.** Age groups between 26-45 and 46-65 years had better resolution than patients in 66-85 years age group. In this study, sex distribution showed male preponderance. 80% of cases were males, 20% were females. Similar distribution was also noted in each category of ST resolution. In this present study, Anterior wall MI (66.7%) was more common than inferior wall MI (33.3%). Our study showed significant association between type of infarction and ST segment resolution ($p<0.05$). Similar findings were seen in study by Schroder et al.[11], French et al.[12], Anderson et al.[15].

In this study incidence of smoking, hypertension, AWMI resolution than IWMI was comparable to other studies. Higher percentage of diabetics of were noted in partial resolution subgroup, however, study conducted by Schroder et al.[11], French et al.[12], Dong et al.[13] showed to have lesser incidence of DM.

CONCLUSION

The present study showed that majority of the patients belonged were males and belonged to middle age group (45 to 65 years), they presented with chest pain (95%) as the most common presentation. Smoking was the most common risk factor seen in 55% of study population. Only 5 of 26 patients thrombolyzed between 6-12 hours of symptom onset had complete resolution. Preventive measures may be more effective if they are taken in the second and thirddecade of life.

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