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Clinical Profile and Risk Factors Associated with Acute Myocardial Infarction

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Abstract

Background: Acute myocardial infarction (AMI) is a significantly raising problem particularly in India in young as well as in elderly patients. This has aroused considerable interest in recent years and being recognized with increasing frequency. The present research was undertaken to study the risk factors and clinical profile of patients with acute myocardial infarction.
Method: The study included 90 consecutive patients with AMI admitted in the ICCU of a tertiary care center. Demographic features, cardiovascular risk factors, clinical presentation, Electrocardiogram (ECG) findings, regions of infarction were studied and documented.
Results: Out of 90 patients, 49 (54.44%) were males and 41(45.55%) were females. The mean age of patients was 59.25±13 years, with a maximum number of patients (32; 35.55%) belong to the age of 61–70 years. All the patients (90; 100%) presented with chest pain followed by sweating (36.66%) and vomiting (14.44%). The maximum numbers of patients (84.44%) were in the Kilips Class- I. Hypertension (46.66%) was the major risk factor for MI followed by alcoholism (35.55%) and smoking (33.33%).Inferior wall myocardial infarction was the commonest type seen on ECG (41, 45.55%).
Conclusion: Elderly patients were most commonly affected with male predominance. Chest pain was the most common presenting symptom. Most common risk factor contributing to AMI was hypertension.
Keywords: Acute myocardial infarction, Clinical profile, Risk factor, Electrocardiogram, Chest pain, Kilips Class.

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1. Introduction

Cardiovascular diseases (CVD) have emerged as a major health burden in developing countries like India [1]. It is predicted that more than half the worldwide CVD risk burden will be borne by the Indian subcontinent in the next decade according to recent epidemiological studies [2, 3]. However, the CVD are the number one cause of death globally, majority of the deaths due to CVD are due to coronary heart disease [4, 5]. Myocardial infarction (MI) is one of the five main manifestations of coronary heart disease, namely stable angina pectoris, unstable angina pectoris, MI, heart failure and sudden death [6].

Acute myocardial infarction is an event of myocardial necrosis caused by an unstable ischemic syndrome [7]. It is an important disease entity in developed nations and recently in developing nations [8]. It usually affects the middle and older age groups. It is an uncommon disease in young adults and its incidence varies between 2%-10% according to different survey [9]. However the growth of cardiology as a specialty may be explained by a study of the attention given to acute myocardial infarction [10]. In practice, the disorder is diagnosed and assessed on the basis of clinical evaluation, the electrocardiogram

(ECG), biochemical testing, invasive and noninvasive imaging, and pathological evaluation [11]. New cases of AMI tell us about the prevalence of risk factors in the community which lead to increased incidence of AMI. On the other hand, the occurrence of repeated attacks of AMI tells us about the quality of care received by the patient during the attack of AMI and its subsequent treatment [12].

Although population above the age of 65years can be estimated to be more than 90%and has more than 50% of the patients with AMI. Various risk factors of AMI are hypertension, smoking, diabetes, obesity etc. If the patient develops any other co-morbidity, then it affects the treatment of the AMI [13]. Co-morbidities in a patient with already known AMI affect the outcome in such patients. Study of risk factors and clinical profile of the patient is important [14]. Hence present study was carried out to study risk factors and clinical profile of patients with acute myocardial infarction

2. Materials and Methods

The present study consisted of 90 consecutive patients of Acute Myocardial Infarction (AMI) admitted to ICCU of a tertiary health care center. Only patients who satisfied World Health Organization (WHO) definition [15] for the diagnosis of AMI were selected for the study. The study was approved by the Institutional Ethics Committee and written informed consent was obtained from the participants. Patients with stable angina, those who are below 20 years and patients who are unwilling to participate in the study were excluded.

Diagnosis was based in presence of at least two of the following three criteria:

1) A clinical history of ischemic type chest discomfort.
2) Changes in serially obtained electrocardiographic tracings.
3) A rise and fall of serum cardiac markers.

After a detailed history and thorough clinical examination, routine investigations were done including ECG, serum cardiac markers, RBS, Lipid profile, chest x-ray and 2D-echo to confirm the diagnosis. Also complete general and systemic physical examination was done in all patients and severity of AMI was classified according to Killip's classification [16]. Coronary angiography was performed in all patients to assess the number and type of vessels which were involved. The special attention was paid to the presence of risk factors. The risk factors which were studied were hypertension, smoking habits, obesity (BMI>30kg/m^2), family history of ischemic heart disease, smoking and alcohol consumption.

Data were expressed in frequency, percentage, meanand standard deviation as applicable. Data were analyzed byusing Microsoft excel.

3. Observations and Results

A total of 90 patients diagnosed with myocardial infarction were studied regardless of the therapeutic intervention they received. Among 90 patients, 49 (54.44%) were males and 41(45.55%) were females. The mean age of patients was 59.25±13years, with a maximum number of patients (32; 35.55%) belong to the age of 61–70 years, (Table 1).

Table 1: Demographic profile of the patients

Age groups (Years)	No. of Patients	Percentage
21-30	03	3.33
31-40	08	8.88
41-50	12	13.33
51-60	19	21.11
61-70	32	35.55
71-80	14	15.55
>81	02	2.22

The distribution of patients according to occupation was shown in table 2. The maximum numbers of patients were housewife (28.88%) followed by laborer (24.44%) and former (18.88%).

Table 2: Distribution of patients according to Occupation

Occupation	No. of Patients	Percentage
Housewife	26	28.88
Laborer	22	24.44
Former	17	18.88
Vendor	08	8.88
Clerk	05	5.55
Maid	04	4.44
Tailor	04	4.44
Driver	03	3.33
Student	01	1.11

The commonest presenting symptom was chest pain (100%), followed by sweating (36.66%) and vomiting (14.44%). Other presenting symptoms were shown in table 3. All the patients had chest pain at presentation. The duration of chest pain before admission to ICCU varied from less than one hour to >12 hours. 44 (48.88%) of the 90 patients were admitted to the hospital within 6 hours of onset of chest pain (Table 3). Maximum patients (84.44%) belong to Killip's class I followed by 6 patients in Killip's class II (6.66%). The most grievous Killip's class IV was seen in 4patients (4.44%), (Table 3).

Table 3: Showing symptoms at the time of admission, duration of chest pain before admission and Killips' classification

Symptoms	No. of Patients	Percentage
Chest Pain	90	100
Sweating	33	36.66
Vomiting	13	14.44
Breathlessness	10	11.11
Palpitation	11	12.22
Duration (hours)	**No. of patients**	**Percentage**
0-6	44	48.88
7-12	25	27.77
>12	19	21.11
KILIPS CLASS	**No. of patients**	**Percentage**
Class I	76	84.44
Class II	6	6.66
Class III	4	4.44
Class IV	4	4.44

Hypertension (46.66%) was the major risk factor for MI followed by alcoholism (35.55%) and smoking (33.33%), (Table 4).

Table 4: Distribution of selected risk factors

Risk Factors	No. of Patients	Percentage
History of hypertension	42	46.66
Alcoholic	32	35.55
History of smoking	30	33.33
Obesity	17	18.88
History of IHD	06	6.66

The most common MI in the present study was inferior wall MI (45.55%). Other groups were anterolateral wall myocardial infarction (ALWMI) (17.77%) and anterior wall myocardial infarction (AWMI) in 16.66% of the patients, (Table 5).

Table 5: Type of Myocardial infarction [ECG based]

Type of MI	No. of patients	Percentage
IWMI	41	45.55
ALWMI	16	17.77
AWMI	15	16.66
ASWMI	11	12.22
IPWMI	7	7.77

4. Discussion

Coronary heart disease is the leading cause of death among elderly patients [17]. Previous studies have found that in patients with acute myocardial infarction (AMI), old age was associated with a higher prevalence of comorbid conditions, atypical presentation, non-diagnostic electrocardiogram (ECG), complications, and mortality [18]. In present study AMI is more common in the elderly patients of age between 61-70 years and les common in the younger age group (21-30 years), there is striking increase in incidence of disease as age advances. It confirms that age is non-modifiable, most powerful and independent risk factor for AMI. The oldest patient in this study was of 83years of age and the youngest patient was of 24years age. The average age of the patient was 59.25±13years. This is consistent with findings of other authors [19-23]. The rate of AMI was higher in males than in females (54.44% versus 45.55%) which are comparable with the study done by Adhikari *et al* [20] and Singh *et al* [24]. Present study demonstrated that with increasing age the number of females with MI also increased. This may be due to loss of protective effect of estrogen in post-menopausal women. The vasodilatory action of estrogen may be responsible for this protective effect [25].

Earlier studies [26, 27] found that the chest pain is the most common presentation of AMI in elderly patients, they are also known to present with atypical symptoms such as giddiness, dyspnea, vomiting, sweating, and epigastric pain in the absence of chest pain. Some investigators have found that up to 30% of patients with AMI may not experience any symptom, [28] and many experience no pain [29]. These patients often complain of shortness of breath, extreme fatigue, nausea, or fainting. The current study reported chest pain as a predominant symptom (100%)as observed in the previous studies [19-23]. Maximum patients (76.66%) presented to the hospital within12 h of onset of symptoms. This accounted for one of the major reasons for not thrombolysing the patients. Similar finding was noted in other studies [19, 27]. Killip's classification indicates the clinical severity of AMI at the time of presentation. Maximum patients (84.44%) belong to Killip's class I followed by in Killip's class II (6.66%). The findings of present study co-relate with that of GISSI-2 study [18] and Seetharama *et al* study [22].

Among the risk factors, commonest risk factor was hypertension presented in 46.66% of the patients. This finding co-relates with that of Adhikari *et al* [20] who have reported hypertension as a risk factor in 43.18 % of patients. Also, hypertension was significantly associated with MI in different studies in South Asia [24, 30]. Smoking (33.33%) was the less common risk factor in current study, this finding was like the previous studies in which smoking was a less common risk factor in the elderly population. In one of the study done before, hypertension was commonly seen in elderly patients (39%). Smoking was seen in only 17.1% of the patients [31].

The most common myocardial infarction was inferior wall MI (45.55%), which is closely similar to the study done by Chavan *et al* [21]. Likewise the inferior wall was the predominant site of infarction in other study in Pakistan [30]. Anterior wall myocardial infarction observed in only 16.66% of the patients. Patients with anterior wall MI have worse prognosis with increased incidence of

complications and deaths than inferior wall MI [32, 33]. Although the follow up data were not available, the lesser incidence of anterior wall MI may contribute to decreasing mortality burden from MI in present setting.

Small sample size and the data collected from single tertiary care centre constitute the limitations of the present study.

5. Conclusion

Elderly patients were most commonly affected with male predominance. Chest pain was the most common presenting symptom. Most common risk factor contributing to AMI was hypertension. Inferior wall myocardial infarction was the common lesion seen in the present study. Most of the patients were admitted to the hospital within 6 hours of onset of symptom. The maximum number of patients presented with no clinical signs of heart failure i.e. in Kilips Class- I.

The present study suggested that there is need for early detection of risk factor to prevent the progression of coronary heart disease, need for creating awareness in the community regarding risk factors, symptoms and signs of acute myocardial infarction so that early referral can be done to coronary care unit to prevent morbidity and mortality in the community.

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