Research Article

Clinical profile of acute myocardial infarction patients: a study in tertiary care centre

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ABSTRACT

Background: Coronary Artery Disease (CAD) remains the major cause of mortality and morbidity of mankind. Even though lot of advances are made in diagnosis, management and prevention of the disease. Coronary Artery Disease (CAD) is the leading cause of death in the United States, affecting over 5 million Americans. It is the most common cause of death in most western countries.

Methods: This study was carried out in Intensive Coronary Care Unit (ICCU) of McGann hospital, Shimoga. The material of study consisted of 100 consecutive patients of Acute Myocardial Infarction (AMI) admitted to ICCU of McGann hospital from January 2014 to November 2014. Only patients who satisfied World Health Organization (WHO) definition for the diagnosis of AMI were selected for the study.

Results: The age of patients in this study ranged from 24 years to 85 years. Mean age 52.91 ± 13.19 years. Out of 100 cases, 82 were males and 18 were female. The male to female ratio was 4.5:1. Among the 100 patients studied, 92 patients (92%) had atleast on of the risk factors mentioned above and 46 patients (46%) had more than one risk factors. 45 of the 96 patients (46.88%) percentage to the hospital within 6 hours of onset of chest pain. The pulse rate was within normal limits in 65 patients (65%). 26 patients (26%) had tachycardia at time of presentation and 9 patients (9%) had bradycardia. In 29 patients (29%) blood pressure was more than 140/90 mmHg and 15 patients (15%) had hypotension at time of presentation. In remaining 56 patients (56%) blood pressure was within normal limits. JVP was elevated in 6 patients (6%). 4 patients (4%) were in cardiogenic shock at the time of presentation and 13 patients (13%) were in left ventricular failure.

Conclusion: 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.

Keywords: Coronary artery disease (CAD), McGann hospital, Acute myocardial infarction (AMI)

INTRODUCTION

Coronary Artery Disease (CAD) remains the major cause of mortality and morbidity of mankind. Even though lot of advances are made in diagnosis, management and prevention of the disease. Coronary artery disease (CAD) is the leading cause of death in the United States, affecting over 5 million Americans. It is the most common cause of death in most western countries.

Prevalence of coronary artery disease in India

In 2003, the prevalence of CHD in India was estimated to be 3-4 per cent in rural areas (two-fold higher compared with 40 year ago), and 8-10 per cent in urban areas (six-

fold higher compared with 40 year ago), with a total of 29.8 million affected (14.1 million in urban areas, and 15.7 million in rural areas) according to population-based cross-sectional surveys.[1,2].

The Global Burden of Diseases (GBD) study reported the estimated mortality from coronary heart disease (CHD) in India at 1.6 million in the year 2000.[3] A total of nearly 64 million cases of CVD are likely in the year 2015, of which nearly 61 million would be CHD cases (the remaining would include stroke, rheumatic heart disease and congenital heart diseases). Deaths from this group of diseases are likely to amount to be a staggering 3.4 million.[4]

Driving this steep rise in CVD risk factor burden is the rapid increase in the proportion of urban inhabitants (currently at 30% with a projected rise to 43% in 2021).[5] Urbanization is characterized by a marked increase in the intake of energy-dense foods, a decrease in physical activity, and a heightened level of psychosocial stress, all of which promote the development of dysglycaemia, hypertension, and dyslipidaemia.[6] The burden of CVD and its risk factors in India calls for a sound public health approach to stem the epidemic. Efforts to put in place an intervention programme should be complemented with a robust surveillance mechanism so as to monitor, evaluate and guide policies and programmes[7] although much of the current enthusiasm in management of acute MI is related to revascularization strategies. Electrical as well as mechanical complications continue to pose a major threat to recovery in some patients. With early recognition and prompt treatment of arrhythmias there has been substantial reduction in mortality among patients with AMI. In fact in-hospital mortality has decreased from 30% in 1960s to 10% in 1980s, after introduction.

METHODS

This study was carried out in Intensive Coronary Care Unit (ICCU) of McGann hospital, Shimoga.

The material of study consisted of 100 consecutive patients of Acute Myocardial Infarction (AMI) admitted to ICCU of McGann hospital from January 2014 to November 2014. Only patients who satisfied world Health Organization (WHO) definition for the diagnosis of AMI were selected for the study.

Inclusion criteria

Patients satisfying WHO definition[8] for diagnosis of myocardial infarction were included in the study.

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.

Exclusion criteria: Nil

A detailed history was taken in all the patients and a through physical examination was done.

The first electrocardiogram (ECG) was recorded at the earliest after admission and subsequently at eight hourly interval on first day, daily for the duration of stay ICCU and thereafter as per need. If thrombolytic therapy was given, 12 lead ECG was recorded before and after the thrombolytic therapy. Right ventricular leads were recorded whenever deemed necessary (in patients with inferior wall MI). Patients were mentioned for any clinical changes and ECG changes. Standard lead II was used to monitor and record rhythm disturbance; modified chest lead I (MCL_1 lead or Marriot's lead) was used whenever necessary. In addition 12 lead ECG was also recorded during occurrence of arrhythmias. ECGs were recorded on BPL Cardiart 408. Patients were mentioned on Hewlett Packard 'Code master-model M1722A'.

The other investigations to which the patients were subjected are as follows:

- Urine routine analysis (Sugar, albumin and microscopy).

- Blood routine (Hemoglobin percentage, total count, differential count, erythrocyte sedimentation rate).

- Random blood sugar (Fasting blood sugar/post prandial blood sugar was done whenever necessary), blood urea, serum creatinine.

- Lipid profile.

Special investigations

a. Echocardiography (2D) was done to confirm Myocardial infarction.

b. Chest X-ray/screening (whenever required).

c. Serum electrolytes (whenever required).

Patients were kept in ICCU for 3-5 days provided no other complication was present. From ICCU they were transferred to cardiac ward and discharged after 1-2 weeks.

Limitation of the study

Coronary angiogram is not done due to lack of facility.

Patients were classified on particular aspects as follow:

Socio-economic status[9]

Table 1: Modified B. G. Prasad's classification for 2013.

Socioeconomic status	Class	Per capita income
Upper class	I	Rs 5156 and above
Middle class	II	Rs 2578-5155
	III	Rs 1547-2577
	IV	Rs 773-1546
Lower class	V	Below Rs 773

Killip's classification[10]

Based on physical findings at the time of admission patients were grouped into Killip's class as follows:

Class I - Absence of rales over lung fields and absence of third heart sound.

Class II - Rales over 50% or less of the lung fields or presence of third heart sound.

Class III - Rales over more than 50% of lung fields (Pulmonary edema).

Class IV - Cardiogenic shock.

RESULTS

100 consecutive patients of acute myocardial infarction admitted to ICCU of McGann hospital, Shimoga from January 2014 to November 2014 were studied. The following are the observations made from this study.

Age distribution

Table 2: Showing age distribution.

Age group (years)	No. of patients	Percentage
Less than 30	5	5
31-40	16	16
41-50	26	26
51-60	31	31
61-70	12	12
71-80	7	7
More than 81	3	3
Total	100	100

The age of patients in this study ranged from 24 years to 85 years.

Mean age 52.91 ± 13.19 years.
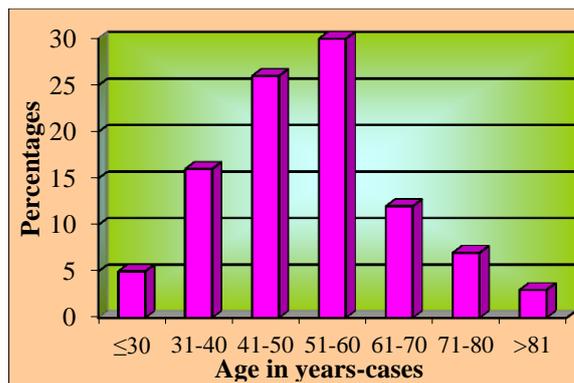
Figure 1: Showing age distribution.

Sex distribution

Table 3: Showing sex distribution.

Sex	No. of patients	Percentage
Male	82	82
Female	18	18

Out of 100 cases, 82 were males and 18 were female.

The male to female ratio was 4.5:1.
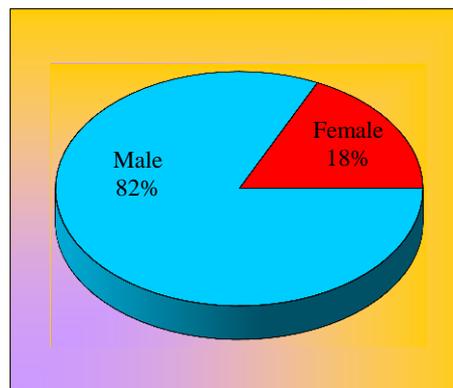
Figure 2: Sex distribution.

Occupation

Table 4: Showing occupation of the patients.

Occupation	No. of cases	Percentage
Farmer	32	32
Housewife	18	18
Manual labourer	16	16
Driver	6	6
Clerk	4	4
Security guard	3	3
Fruit vendor	3	3
Others	18	18

Socioeconomic status

Table 5: Showing socioeconomic status of the patients.

Socioeconomic status	No. of cases	Percentage
Upper class	4	4
Middle class	36	36
Lower class	60	60

Risk factors

Among the major risk factors, excluding the age and sex, following observations were made.

Table 6: Showing the coronary risk factors.

Risk factors	No. of cases	Percentage
Smoking	76	76
Hypertension	23	23
Diabetes mellitus	21	21
Hypercholesterolemia	22	22
Obesity	7	7
Family history of IHD	7	7

Among the 100 patients studied, 92 patients (92%) had atleast on of the risk factors mentioned above and 46 patients (46%) had more than one risk factors.
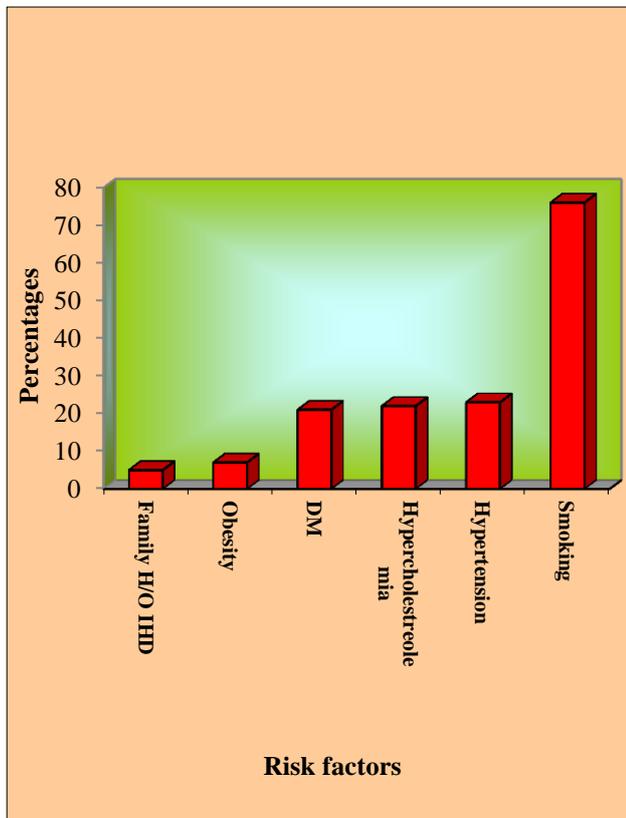
Figure 3: Showing the coronary risk factors.

Clinical presentation

Table 7: Showing the symptoms present at time of admission.

Symptoms	No. of cases	Percentage
Chest pain	96	96
Sweating	81	81
Vomiting	30	30
Breathlessness	17	17
Giddiness	13	13
Palpitation	7	7
Pain abdomen	4	4
Weakness of right upper and lower limb	1	1
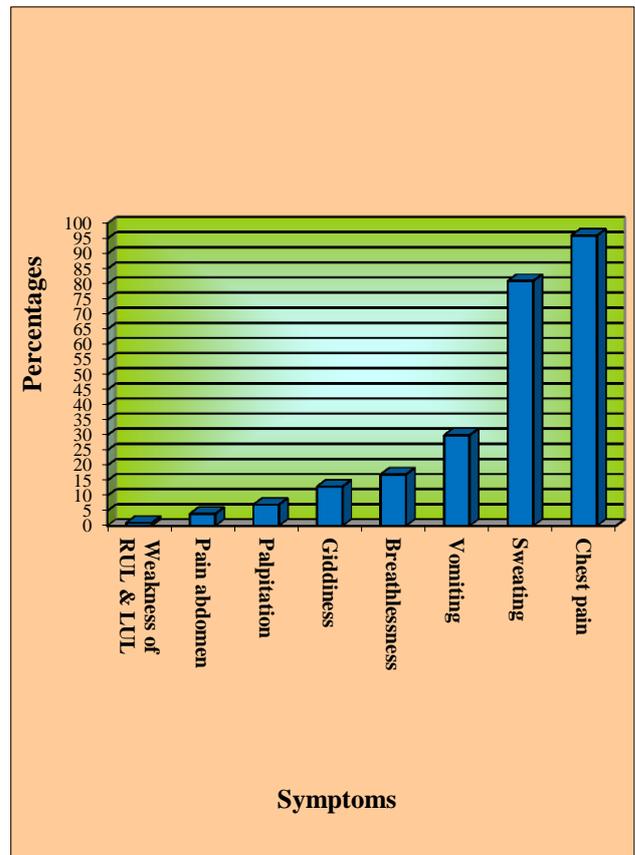
Figure 4: Showing the symptoms present at time of admission.

Duration of chest pain

96 patients had chest pain at presentation and 4 patients had symptoms other than chest pain. The duration of chest pain before admission to ICCU varied from less than one hour to one week.

45 of the 96 patients (46.88%) percentage to the hospital within 6 hours of onset of chest pain (Table 8).

Table 8: Showing duration of chest pain before admission.

Duration (hours)	No. of patients	Percentage
Less than 1	5	5.21
1-6	40	41.67
7-12	18	18.75
13-24	12	12.50
25-48	7	7.29
49-72	7	9.37
More than 73	5	5.21

Physical findings at admission

Pulse: The pulse rate was within normal limits in 65 patients (65%). 26 patients (26%) had tachycardia at time of presentation and 9 patients (9%) had Bradycardia.

Blood pressure: In 29 patients (29%) blood pressure was more than 140/90 mm Hg and 15 patients (15%) had hypotension at time of presentation. In remaining 56 patients (56%) blood pressure was within normal limits.

Jugular venous Pressure (JVP): JVP was elevated in 6 patients (6%).

Heart sounds: Heart sounds were of normal intensity in 94 patients (94%) and muffled in 6 patients (6%). Two patients had varying intensity of first heart sound. Third heart sound was present in 17 patients (17%). 33 patients (33%) had fourth heart sound.

4 patients (4%) were in cardiogenic shock at the time of presentation and 13 patients (13%) were in left ventricular failure.

Killips' classification

Patients were classified according to Killips' classification as follows:

Table 9: Showing Killips' classification at admission.

Class	No. of patients	Percentage
Class I	83	83
Class II	11	11
Class III	2	2
Class IV	4	4

DISCUSSION

The observations made in 100 case of Acute myocardial infarction, admitted to the ICCU of McGann hospital, Shimoga between January 2014 to November 2014 is discussed here and the results have been compared with other studies.

Age

The age distribution of these patients ranged from 24 years to 85 years with maximum number of patients in the age group 51 to 60 years. There were 31% of patients in this age group. This is consistent with findings of other authors who have quoted a similar incidence in this age group [Julian et al. (1964)[11] - 32%; Bahl et al. (1969)[12] - 30.4%; Rajgopalan et al. (1972)[13] - 33.2% and Jacob et al. (1992)[14] - 32%].

21% of the patients were aged 40 years or below. This is comparable with study of Siwach et al. (1998)[15] who have quoted an incidence of 19.2%.

Sex

There were 82 males (82%) and 18 females (18%) in the present study. The male to female ratio was 4.5:1. This findings is consistent with that of Maggioni et al. (1993)[16] - 4.65:1; Prabhakar et al. (1998)[17] - 4.2:1 and Elizabeth GC (1998)[18] - 5.2:1.

Socioeconomic status

In this study highest number of patients were from lower income group (60%). Followed by 36% of patients from middle income group and only 4% of patients were from upper income group. This finding is not seen conformity with other studies (which show high incidence of MI in upper socio-economic group), probably because majority of patients admitted to Mc Gann Hospital hail from lower strata.

Secondly, it has been found by some authors that, over the years there has been a increase in incidence of MI in people from lower socio-economic class. Compared to a earlier study[19] during 1974-76, Aggarwal et al have found a three fold increase in incidence of MI in under privileged class during a study[20] done in 1982-83. They have attributed this mainly to an increase in the prevalence of smoking, started very early in this socio-economic group.

Risk factors

Smoking: Smoking was the commonest risk factor present in as many as 76 patients (76%). This figure is in accordance with the finding of Majeed et al. who have reported it to be present in 73.3% of the patients.

Diabetes mellitus: 21% of the patients were diabetics. This is comparable with studies of Aggarwal et al, Subramanyam et al and Bhattacharya et al who have reported diabetes as risk factor in 19%. 19.54% and 19.09% of patients respectively.

Hypertension: In this study hypertension was present in 23% of the patients. This finding co-relates with that of Kundu et al. and Subramanyam et al. who have reported

hypertension as a risk factor in 22.55% and 22.06% of the patient respectively.

Hypercholesterolemia: 22 patients (22%) in the present study had hypercholesterolemia [6 patients also had hypertriglyceridemia]. This co-relates with study of Bhattacharya et al., Parmeshwara V. and Majeed et al. who have reported it to be present in 21.43%, 20.8% and 21% of the patients respectively.

Obesity: 7 patients (7%) in this study were obese. According to Bhattacharya et al obesity is a risk factor in

7.4% factor in 7.4% of patients. Which is comparable to the present study.

Family history of Ischemic heart disease (IHD): 7 patients (7%) had family history of IHD. This is in conformity with study of Bhattacharya et al. - 7.65%.

Symptomatology

The findings of the present study are comparable with that of below studies (Table 11).

Table 10: Showing comparison of present study with other studies with regard to coronary risk factors.

Risk factors	Aggarwal et al. (1978)[19]	Kundu et al. (1984)[21]	Subramanyam et al. (1984)[22]	Bhattacharya et al. (1986)[23]	Parameshvara V (1986)[24]	Majeed et al. (1998)[25]	Present study
No. of patients	200	305	2579	196	5040	60	100
Smoking	25.5	51.47	52.69	27.04	47.3	73.3	76
Diabetes mellitus	19	15.20	19.54	19.09	32.3	13.3	21
Hypertension	10.5	22.55	22.06	41.84	37.6	8.3	23
Hypercholesterolemia	-	60.95	-	21.43	20.8	21	22
Obesity	36	-	13.37	7.4	35.8	15	7
Family history of IHD	-	-	12.95	7.65	16.2	30	7

Table 11: Showing symptoms, as reported by various authors (percentage).

Symptoms	Subramanyam et al. (1984)	Jacob et al. (1992)[14]	Kudenchuk et al. (1996)[26]	Present study
No. of patients	2579	100	1097	100
Chest pain	94	91	99	96
Breathlessness	56	19	51	17
Palpitation	29	8	-	7
Giddiness	16	14	-	13
Sweating	-	83	72	81
Epigastric discomfort	-	3	10	4
Vomiting	-	11	55	30
Weakness of right upper and lower limbs	-	-	-	1

Duration of chest pain prior to admission

Table 12: Showing interval between onset of chest pain and hospitalization, as reported by various authors (percentage).

Duration (hours)	Datey et al. (1969)[27]	Kundu et al. (1982)[21]	Present study
No. of patients	100	305	100*
Less than 6	44	49	46.87
7-12	20	10.2	18.75
13.24	8	11.56	12.50
More than 24	28	29.2	21.87

*Only 96 patients had chest pain

In present study, 96 patients (96%) had chest pain as a presenting symptom. Of the remaining 4 patients, 1 presented with dyspnea, 1 with sweating, 1 with vomiting and 1 with weakness of right upper and lower limbs.

75 of 96 patients (78.13%) presented within 24 hours of onset of chest pain, with 46.87% presenting within 6 hours.

The findings of present study correspond with above studies.

Physical findings at admission

Pulse: 26 patients (26%) had tachycardia at presentation. 15 patients (15%) had bradycardia. Out of these, one

patient had complete heart block and remaining 14 patients had sinus bradycardia.

Blood pressure: 29 patients (29%) had blood pressure more than 140/90 mmHg at presentation. Out of these 8 patients (8%) were known hypertensives, detected prior to the acute episode.

15 patients (15%) had hypotension on admission; 4 of these were in cardiogenic shock and another 4 patients had inferior wall infarction with right ventricular infarction.

Jugular Venous Pressure (JVP): JVP was elevated in 6 patients when they presented to the hospital - 5 of these had inferior wall infarction with right ventricular infarction and 1 patient was in congestive cardiac failure.

Heart sounds: Heart sounds were of normal intensity in majority of patients and muffled in only 6 patients (6%). Two patients had varying intensity of first heart sound; these patients had complete heart block. 13 patients manifested with third heart sound, of which 4 were in cardiogenic shock and 13 patients had left ventricular failure. 33 patients (33%) had fourth heart sounds at time of presentation.

Killip classification

Table 13: Showing Killip classification at admission (percentage).

Killip class	Maggioni et al.* (1993)[16]	Present study
No. of patients	8676	100
Class I	82.8	83
Class II	15.2	11
Class III	1.6	2
Class IV	0.3	4

*GISSI - 2 results

The findings of present study co-relates with that of GISSI-2 study.

CONCLUSION

100 consecutive cases of acute myocardial infarction admitted to McGann hospital, Shimoga were selected for the study.

1. Age of the patients ranged from 24 years to 85 years. The mean age was 52.914 ± 13.19 years.

2. There was high male preponderance with male to female ratio being 4.5:1.

3. Majority of the patients belonged to lower socio-economic class (60%).

4. 92% of patients had at least one major risk factor and 46% had more than one major risk factors. Smoking (76%) was the commonest risk factor followed by hypertension (23%).

5. Chest pain (96%) was the most common presenting symptom follower by perspiration (81%) and vomiting (30%).

6. Majority (76%) of patients were admitted within 24 hours of onset of symptoms.

7. 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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