Original Article

A study of clinical profile and assess the modifiable and non-modifiable risk factors of acute myocardial infarction in young adults

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Abstract

Background: Cardiovascular diseases are one of the most important causes of morbidity and mortality in the world today. Along with classical risk factors like dyslipidemia, hypertension, Diabetes mellitus and familial history of Coronary Artery Disease (CAD) modifiable risk factors like smoking and alcohol are significantly contributing to the statistics in young adults with acute myocardial infarction (AMI). Objective: To study the clinical profile and assess the modifiable and non-modifiable risk factors of AMI in young adults. Methods: All patients aged ≥18yrs and ≤40yrs hospitalized with Acute Myocardial Infarction (AMI) from 2013 to 2015 are evaluated for clinical profile, risk factors & outcome. Results: Of the 50 patients mean age was 37.44yrs (±3.69), and males were more than the females with a ratio of 21:4. All patients presented with the chief medical symptom of chest pain and most patients had a combination of risk factors like dyslipidemia, hypertension, and diabetes mellitus. Smoking is found to be the most important independent risk factor in young males (93%). Anterior wall AMI was the predominant diagnosis, complications were very less with mortality of only 3%. The LVEF was very good on 2-D-Echocardiography (76% > 40). Conclusion: Younger patients have an excellent long-term and short-term prognosis because of their better baseline characteristics, thus requiring a different line of management concerning the older age group. Therefore it is important to highlight the modifiable and non-modifiable risk factors in young adults so as to have a better prognosis and higher life expectancy.

Keywords: Coronary Artery Disease, Acute Myocardial Infarction, Younger Patients.

I. INTRODUCTION

Cardiovascular diseases are the most important causes of morbidity and mortality in the world today, most importantly adding to statistics are coronary artery diseases. Though AMI is not uncommon in young adults, especially below the age 40yrs in developing countries like India, the incidence is fast raising1,2. Many of the patients may not have classical risk factors for ischemic heart disease (IHD) excluding smoking and a large portion of them have normal coronary arteries3. Obesity is significantly associated with AMI independent of the classical coronary risk factors in young and middle-aged males5. Young patients with AMI have a stronger family history of cardiovascular diseases and a high prevalence of smoking4,5. Smoking and alcohol consumption are the most important modifiable risk factors in young adults6. Young patients have a better outcome because of their better baseline characteristics, therefore they require a different line of management than the older age group7. Therefore this study aims at identifying the important risk factors and clinical presentation of AMI in young adults, to highlight the importance of modifiable and non-modifiable risk factors and changes in lifestyles, to have a better prognosis and higher life expectancy8.

II. Materials and Methods

Young adults with AMI were admitted to the Cardiac Care Unit of Meenakshi Medical College Hospital and Research Institute, Enathur, Kanchipuram. From 2018 to 2021 and proved by cardiac enzymes and ECG findings. The patient is followed up during the hospital stay. All the patients were included in age between 18-45 years and AMI was proved by clinical features, cardiac enzymes and ECG. A detailed history was taken in all the patients and a thorough physical examination was done as per the

proforma.

The first ECG along with right-sided chest leads was recorded at the earliest after admission and subsequently at 8 hourly intervals on the first day, daily ECG for the duration of the stay in ICCU and thereafter as per need. If thrombolytic therapy was given, 12 lead ECG was recorded with right ventricular leads before and after 2 hours of the thrombolytic therapy. Patients were monitored for any clinical changes and ECG changes. Standard lead II was used to monitor and record rhythm disturbances. Modified chest lead I was used whenever necessary. In addition, 12 lead ECG was also recorded during the occurrence of arrhythmias. Cardiac enzymes (CK-MB & or Troponin) were done in all the patients.

III. Results

In the present study, it is observed that the age ranged from 18yrs to 40yrs, most patients were in the age group 33-40yrs constituting 41 patients(82%). It was also observed that males were more than females 41:9(84%:16). (Table.1)

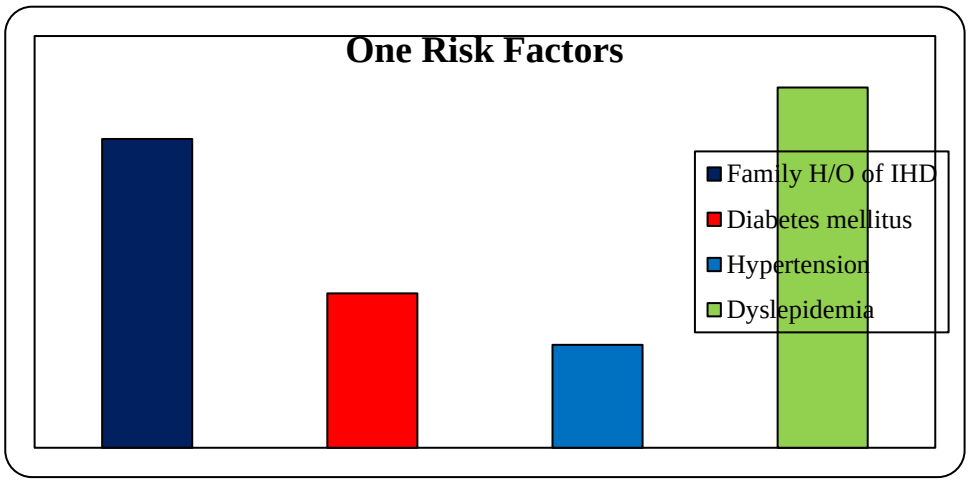
Table-1: showing age & sex wise distribution

Age	Males	Females	Total
18-23	0	0	0
23-28	0	1	1
28-33	7	1	8
33-40	33	8	41
Total	40	10	50

Risk factors

One risk factor

In the present study there are 18 cases with one risk factor out of them 8(44%) are dyslipidemia, there are 5(28%) cases with Family H/O of IHD, and Hypertension alone 1(6%). (Figure.1.)



Two risk factors

In this study, it is observed that there are totally 15cases with two classical risk factors constituting FH+DM 1(7%), FH+HTN 2(13%), FH+DYS 5(34%), DM+HTN (0), DM+DYS 2(13%), HTN+DYS 5(33%). (Table.2)

Table-2: shows two risk factors

Two risk factors	Cases
FH+DM	1
FH+HTN	2
FH+DYS	5
DM+HTN	0
DM+DYS	2
HTN+DYS	5
Total	15

Three Risk factors

In the present study it is observed that there are a total of 2 cases with three risk factors and there are FH+HTN+DYS 1(50%), and DM+DYS+FH 1(50%). (Table.3)

Table-3: Showing Three Risk Factors

Three risk factors	**Cases**
FH+DM+HTN	0
FH+HTN+DYS	1
DM+HTN+DYS	0
DM+DYS+FH	1
Total	**2**

Substance Abuse

In this study out of 42 males, 39(93%) were substance abusers like smoking and alcohol. Among these abusers smokers were 30(77%) and both smokers and alcoholics were 9(23%).Female patients were neither smokers nor alcoholics. (Table.4)

Table-4: showing substance abuse

Substance abuse	**Male**	**Female**
Smoker	30	00
Alcohol	00	00
Both(SM/AL)	09	00
Total	39	00

Clinical Features

In this study there were 15(30%) cases who presented with chief complaints of chest pain(CP) without any associated symptoms(ASS SYMP),and 35(70%) patients presented with chest pain and associated symptoms like nausea, vomiting and sweating. (Table.5)

Table-5: Showing clinical features

Clinical feature	**Male**	**Female**	**Total**
Only cp	10	05	15
Ass symp	32	03	35
Total	42	8	50

Thrombolysis

In this study it was observed that out of the 50cases of AMI 34(68%) patients were thombolysed and 16(32%) patients were not thombolysed. therefore the males were more likely to thrombolysed compared to the females. (Table.6)

Table.6. Thrombolysis status

Status	**Male**	**Female**	**Total**
Thrombolysis	30(71%)	4(50%)	34
No Thrombolysis	12(29%)	4(50%)	16
Total	**42**	**08**	**50**

Diagnosis

In this study it is observed that out of 50 patient,40(80%) patient suffered from Anterior Wall AMI(AWMI) and 10(20%) patients were diagnosed to have Inferior wall AMI(IWMI).out of the 40 AWMI 33(79%) were males and of the total 10 IWMI 9(21%) were males. (Table.7)

Table.7. Showing Diagnosis

Diagnosis	**Male**	**Female**	**Total**
AWMI	33(79%)	07(87%)	40(80%)
IWMI	09(21%)	01(18%)	10(20%)
Total	**42(100%)**	**08(100%)**	**50(100%)**

Two-dimensional Echocardiography

In this study it is observed that young patients with AMI had good EF-78% >40, 14% between 30-39, 10% <30. (Table.8)

Table.8. Showing Echocardiography

E	No. of cases	%
40 or more	38	76
30-39	7	14
<30	5	10
Total	**50**	**100**

Complications

In the present study, it was observed that out of the 50 patients only 9 (18%) had a complication during their stay in the hospital or at the time of presentation. (Table.8)

Table.9. Complications

Complication	**(%)**
Present	18
Absent	82
Total	**100**

IV. Discussion

This prospective study is conducted on 50 young adults with Acute Myocardial Infarction patients who were admitted to Meenakshi Medical College Hospital and Research institute, Enathur, Kanchipuram, Tamil Nadu, India.

Age & Sex

In this study, the age of the patients ranged from 27yrs to 40yrs, though the study selected was between 18yrs to 40yrs, and no patients were below 27yrs. Most patients were between 35-40yrs of age in both sexes (mean age-37.44(±3.69)). It was found that males were more than females. Out of the 50 patients, 42(84%) were males and 8(16%) were females. These observations were inconsistent with the study conducted by, Azar et al9(2007) concluded that females were 17% in their younger group compared to the older group(51.5%), Ricardo Augusto Slaibi Conti et al10(2002) concluded that the mean age in their studies was similar in males and females(F- 41±3.3yrs, M-40.7±3.8yrs).

Risk Factors

In this study it was observed that the majority of the patients had one or a combination of classical risk factors like Hypertention (HTN), Dyslipidemia(DYS), Diabetes Mellitus(DM) & Family history of Coronary Artery Diseases. There were 36% with one only risk factor, 30% with two independent risk factors 4% with three risk factors. All these observations were in consistent with the studies in the past namely Chan M. Y. et al11 (2006).

Substance Abuse

In this study out of the 42 male patients, 39(93%) were smokers and out of this 9(21%) patients were also alcohol abusers. no female patients were either smokers or alcoholics. Smoking in this study is found to the most significant independent risk factor among young individual AMI. These observations are co- related with several studies previously like Chan M. Y. et al11 (2006).

Clinical Feature

In the current study all of the 50(100%) patients presented with chief clinical symptom of chest pain and 35(70%) patients had associated symptoms like nausea, vimitting and sweating.No other symptoms like breathlessness, palpitations, syncope etc manifestated in any of the symptoms. These observations were consistent with the studies earlier;like, Israel Godsman et al12(2003) where chest pain was the chief symptom in 100% of the cases, V C Woon et al13(2003) where chest pain was the chief symptom in 93% of the young patients.

Diagnosis (Territory)

In the current study, it was found that among the 50 patients Anterior Wall MI was the most common diagnosis accounting for 40(80%), followed by Inferior wall MI in 10(20%) of the patients. These observations were inconsistent with the previous studies done by Sanchez Calle JM et al14(1991) observed in their study that out of 80 patients aged under 40yrs, 35 had Anterior wall MI and 9 had Lateral wall MI, 26 had Inferior wall MI and 10 were non-QAMIs.

Thrombolysis

In the current study it was observed that out of the 50 patients, 34(68%) were thrombolysed and females had less frequent thrombolysis compared to their male counterparts. These observations were in consistent with the previous studies; Ricardo Augusto Slaibi Conti et al10(2002) concluded that the use of thrombolytic agent and angioplasty was less frequent in the females than the males(p=0.01; p=0.03,respectively)

Two Dimensional Echocardiography

In the current study it was observed that on 2-D-Echocardiography, the overall EF of the patients with young MI was good. >40 76%, 30-39 14%, <30 10%, these were consistent with studies done previously by Schiller NB et al15(1989).

Complications

In the current study, it was observed that only 9(18%) patients out of 50 had complications during their hospital stay. Left ventricular failure accounted for 5(55.5%), cardiogenic shock and AV-block had 2(22.22%) each, therefore suggesting that long and short-term prognosis in young patients with AMI was excellent. These findings were inconsistent with other studies of Israel Gotsman et al12(2003) done previously.

Coronary Angiography

Out of the 50 patients nine patients came back for follow-up after having undergone angiography at a higher center, and the reports were as follows- Micro vascular Angina(2), CAD-Single artery disease(3), CAD-Double vessel disease/PTCA(1), Normal coronary angiogram(3).(in bracekets are the number of patients).

V. Conclusion

This study was concluded that younger patients had typical anginal chest pain as their chief medical symptom, which may be associated with nausea, vomiting and sweating. Lifestyle habits like smoking was the single most important modifiable risk factor in young adults. There was a combination of classical risk factors (dyslipidemia, hypertension, DM and family history) in many of the patients. Younger patients have an excellent long term and short term prognosis because of their better baseline characteristics thus requiring a different line of management concerning older age group. Therefore it is important to highlight the modifiable and non modifiable risk factors in young adults to have a better prognosis and higher life expectancy.

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