Evaluation of risk factors and pattern of coronary artery involvement in young myocardial infarction patients

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ABSTRACT

MI is rare in young age groups. The study is conducted to evaluate the incidence and clinical presentation of myocardial infarction in young adults presenting with chest pain to the emergency medicine department. Results are Young MI patients were 14.5% of all MI reporting to our ED. Ninety-two% were males. Tobacco, Alcohol and stress were important associations. Ninety-four% of patients presented with typical chest pain. 78% suffered from SVD. The study concludes that the incidence of myocardial infarction is on an increasing trend in <40 years age group is 14.9% of the total cases reported to Bharati Hospital with MI over a period of 12 months. A clear need for a multicentric trial on this issue exists.

Keywords— Young MI, Typical chest pain, Incidence

1. INTRODUCTION

Acute myocardial infarction is rare in teenagers and young adults. The pathophysiology of their infarcts is varied but not usually due to atherosclerotic plaque rupture except for those with genetically predetermined or familial hyperlipidemias. Appropriate treatment has to be adapted from adult management protocols, as there are no controlled trials to guide early treatment of myocardial infarction in this age group.

There is a relative paucity of information concerning the clinical features, natural history, and prognosis in young patients with acute myocardial infarction. Despite the relatively low frequency of myocardial infarction in the young population,' the potential for death and long-term disability make this entity an important clinical problem.

A number of studies have examined the epidemiologic features and the coronary arterial anatomy in young adults with evidence of coronary heart disease, and angiographic studies have demonstrated less extensive coronary artery disease

The incidence of CHD is declining in the UK in all age groups. The actual prevalence of the disease was found to be 0.5% in men and 0.18% in women between 35 and 44 years, 20.5% in men, and 17.1% in women over the age of 60 years.[1]

In fact, the figures in young patients may be lower than actual because of atypical presentation and reluctance to submit themselves for further investigations.[2] However, CHD in the younger population aged less than 40 years was found to represent only 3% of all patients with CHD.[3]

The mean age for the first presentation of acute myocardial infarction in Indians is 53 years[4]. Incidence of CAD in young Indians is about 12%−16%, which is higher than any other ethnic group[4]. Coronary artery disease that occurs at a younger age can have devastating consequences for an individual, the family, and society. Male sex is more prevalent and risk factors, such as tobacco use, overweight, hyperlipidemia, DM, and hypertension are more frequent in young patients with CAD.

As there is an increasing prevalence of young CAD in our country in recent times, this study aimed at studying the incidence and clinical presentation of patients with young CAD.

2. AIM

To evaluate the incidence and clinical presentation of myocardial infarction in young adults presenting with chest pain to the emergency medicine department

3. OBJECTIVES

- To calculate the incidence of patients with chest pain below 45years
- To describe the clinical features with which patient presents to the emergency department.
- To access the data of coronary angiography findings in young adults.
- To correlate the Vit-B12 and homocysteine with the disease.

4. METHODOLOGY

4.1 Study Design
This study will be conducted as a retrospective observational study.

4.2 Inclusion Criteria
- Chest pain patient below 45 years and above 18 years
- Patients with typical chest pain
- Patients with ECG changes and 2D echo changes in relation to a clinical condition.
- Troponin-I values if available.

4.3 Exclusion Criteria
- Patient with age >45 years and less than 18 years
- Patients with non-cardiac chest pain

4.4 Study duration
Duration of the study will be 1year.

4.5 Methodology of Study
(a) Patient data over one year is collected from the medical record room of the Bharati hospital from October 2015 to September 2016.
(b) Details of the patient's initial presentation, history, examination and investigations will be undertaken as per department protocol for patients coming to the hospital.
(c) Details of preadmission interventions if any and their responses will be noted.
(d) Management in the hospital by thrombolysis or Angioplasty or PAMI or combination of thrombolysis and angioplasty after preparing the patient.
(e) Correlating the lab values like Vit-B12 and homocysteine as per the data collected over the study period if available.
(f) Compilation of data and its analysis will be done.

4.6 Aspects which will be studied

4.6.1 Pre-admission
(a) History
- Complaints of patients are noted
- What treatment the patient received before reporting to the hospital?
- Significant past history like DM, HTN, CVS, others
- Data relating to habits like smoking, alcohol consumption.

(b) Examination
- Vitals of the patient like BP, PR, RR, and SPO2 are collected
- Systemic examination of respiratory, cardiovascular, abdomen, central nervous system,
- ECG, 2D echo and cardiac markers collected from the patient files.

4.6.2 In Hospital
- Data of risk factors for MI in young patient are collected from the medical record room
- Analysis of the patients with single-vessel disease, double vessel disease and triple vessel disease in young adults

5. STATISTICAL ANALYSIS
(a) Collected data will be coded and entered in Microsoft Excel sheet
(b) Statistical analysis will be carried out using software SPSS- statistical package for social sciences version 20.0
(c) Quantitative variables will be expressed by using mean, median and standard deviation.
(d) Qualitative variables will be expressed by using frequency and percentage (%)

6. RESULTS
The different results are shown in the figures below.

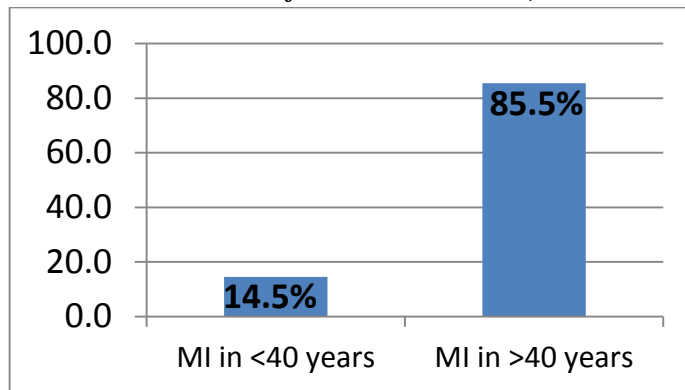In the age group below 40 years, incidence is 14.5% as seen in figure 1.

Fig. 1: Age groups

As seen in figure 2 MI is more in males in the younger age group. Sex distribution among males and females is 11.5:1 as per our study.
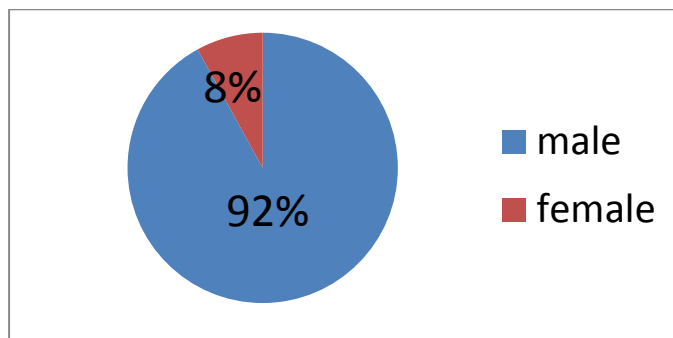

Fig. 3: Male and female ratio

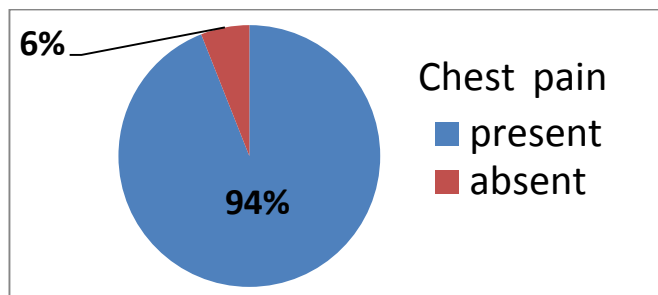Patients presenting with no complaints of chest pain are 6% as seen in figure 4.

Fig. 4: Chest pain

Distributions of risk factors associated with MI in the study group are shown in **figure 5** of which diabetes and hypertension contribute a very less amount but it is more in age group between 31 to 40 years which is more than 21 to 30 years age group
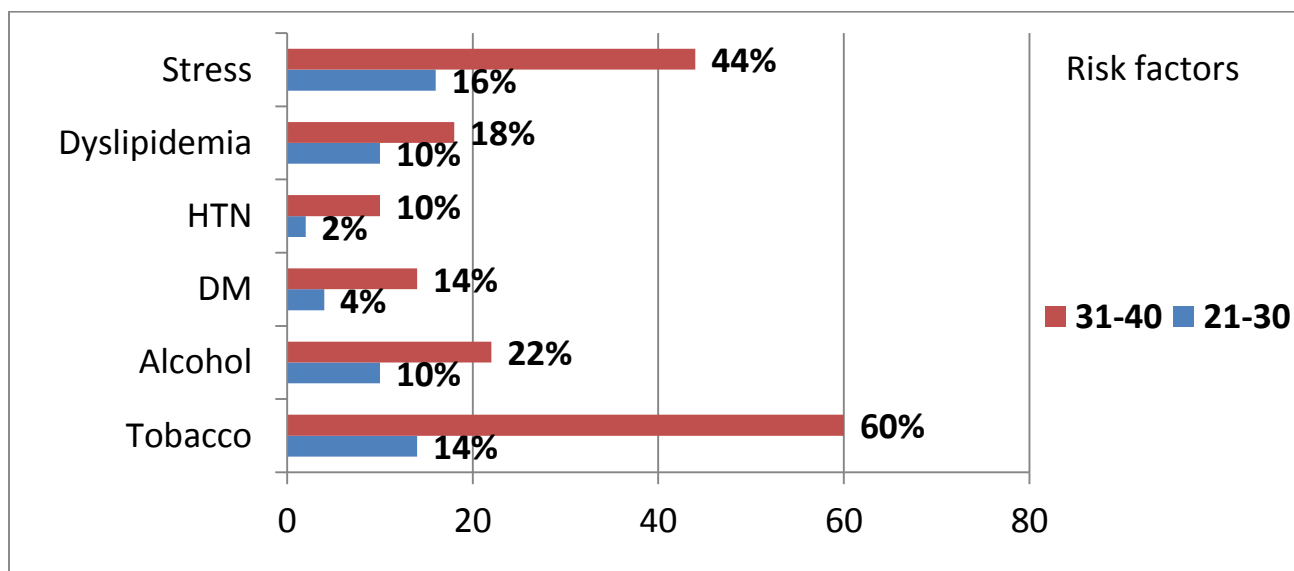

Fig. 5: Risk factors

Figure 6 shows the angiographic profile of 94% patients of which the majority of cases had single coronary vessel involved. In 6% of cases angiography was not done as they died before the procedure.
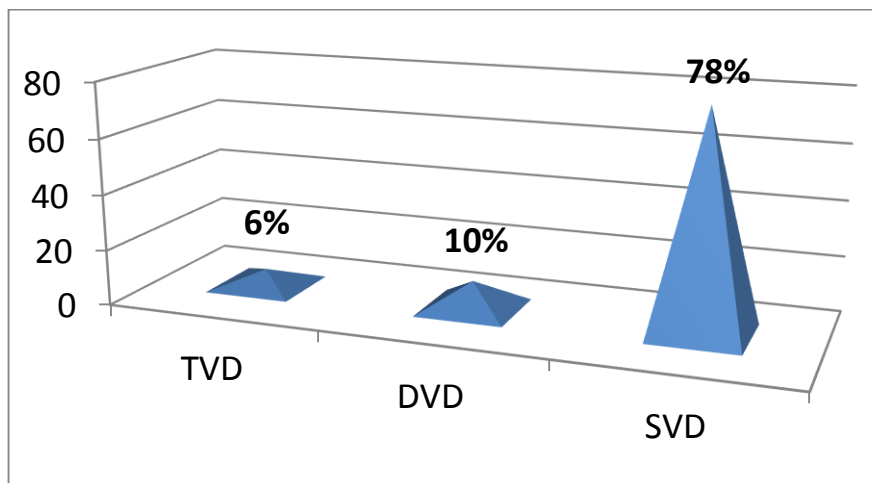

Fig. 6: Angiographic Profile

Management of cases shown in figure 7, of which the majority were managed by angioplasty.
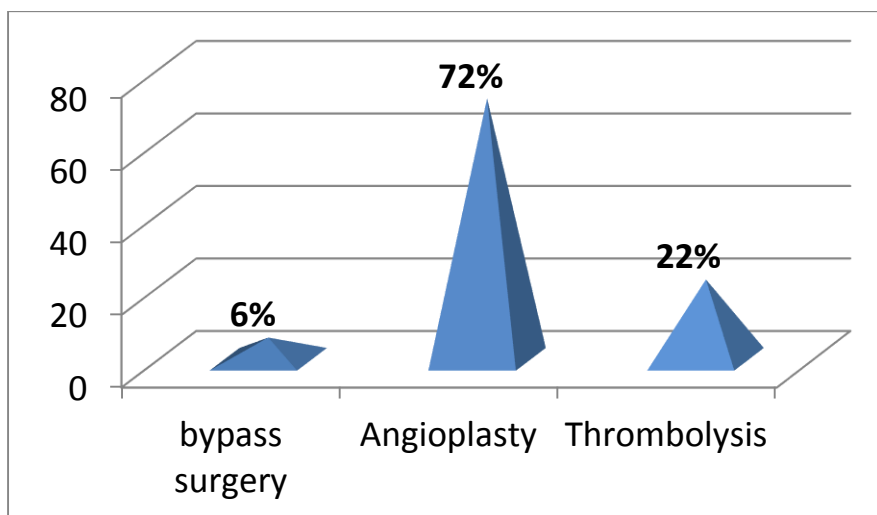

Fig. 7: Management

7. DISCUSSION
- MI is the leading cause of death all over the world. Its incidence is more in the elderly population but MI in young age groups that are less than 45 years is also an increasing trend nowadays.
- In our study, we took people below 40 years for young MI. The incidence of young MI as per our study is 14.5 % among all the MI cases seen and treated in the hospital which shows young MI is on an increasing trend.
- Mark G. Kanitz et al., in their study conducted in 1996 'Myocardial Infarction In Young Adults: Risk Factors And Clinical Features'[5] the mean age of MI patients was 34.8 years (range 17-39); 81% were male. In our study Male to female ratio of MI cases below 40 years was 11.5:1
- Among MI Patients presenting with no complaints of chest pain were 6% as seen in figure 2.
- Distributions of risk factors associated with MI in the study group are shown in figure 5 of which diabetes and hypertension contribute a very less amount but it is more in the age group between 31 to 40 years which is more than 21 to 30 years age group
- In our study diabetes and hypertension contribute very less percentage as risk factors for MI when compared to patients with age group more than 40 years in other studies.
- Figure 6 shows the angiographic profile of 94% patients of which the majority of cases had single coronary vessel involved. Mark G. Kanitz et al in their study conducted in 1996 'Myocardial Infarction In Young Adults: Risk Factors And Clinical Features'[5] observed that single vessel disease is seen in 79% cases and 46% cases in angiography without prior thrombolysis and angiography after thrombolysis respectively.

8. LIMITATIONS
- This study had a small sample size
- Investigations like Vitamin B12, Serum Homocystenine and Vitamin D levels were not done for all patients[6].
- Stress and physical activity are subjective complaints.
- They cannot be definitively called as risk factors.

9. CONCLUSION

- Incidence of myocardial infarction is on an increasing trend in <40 years age group is 14.9% of the total cases reported to Bharati Hospital with MI over a period of 12 months.
- A clear need for a multicentric trial on this issue exists.
- The requirements of investigations like vitamin B12, Serum Homocysteine and vitamin D levels as baseline investigations does exist.

10. REFERENCES

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