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# Clinical and Risk Factor Profile of Acute Myocardial Infarction (Ami) in Young

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## Abstract

Researchers have conducted an evaluation and have reached the conclusion that AMI has considerable potential to impact a normal lifestyle, particularly among young adults. Therefore, our study was conducted to evaluate the risk factors and clinical characteristics associated with young patients diagnosed with ST-elevation myocardial infarction (STEMI). The study conducted was a cross-sectional study, spanning a total duration of one year. Patients between the ages of 15 and 40 who presented with a clinical history of ischemic chest pain and exhibited characteristic electrocardiogram changes were eligible for inclusion in the study. The prevalence of smoking as a risk factor was found to be the highest at 85%, followed by dyslipidemia at 80%. Diabetes was reported as a risk factor in 10% of cases, while hypertension was identified in 5% of cases. Additionally, a positive family history of myocardial infarction was present in 15% of cases. Hence, it is imperative to establish Regional Systems of STEMI and PCI care to ensure efficient management of cases. Additionally, the implementation of educational programs focused on smoking cessation practices and the establishment of clinics dedicated to this purpose are necessary.

## 1. Introduction:

"According to various past studies , although AMI has been found to be less frequent in younger adults than at 45 years of age patient, yet its clinical interest is increasing for young adults due to its ability for premature death and long-term disability".[1-3] "Previously it was concluded that its incidence for young people were upto 2–6%,  but now researchers have proved its increment". [1, 2] " In addition to this , according to studies, this can increased in risk for coronary artery disease (CAD), impaired glucose tolerance and obesity".[4]

Thus, studies have concluded that, " mechanism and pathology of AMI in young patients are different from older population . Therefore, this can be an help to prevent the disease and improve the prognosis".[5]

Hence, our study was done to assess the risk factors and clinical features with young STEMI patients .

## 2. Methods:

Our study was an Cross Sectional type of Study with the period of 1 year intotal. After the informed consent, patients with in age group of years to15 to 40 years presenting with clinical history of ischemic type of chest pain and with characteristic ECG changes suggestive of myocardial infarction with raised cardiac biomarkers (Trop I) were included in the study

Detailed questionnaire and required investigations for assessing risk factors for myocardial infarction was done and data collected during the hospital stay.

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### 3.   Results:
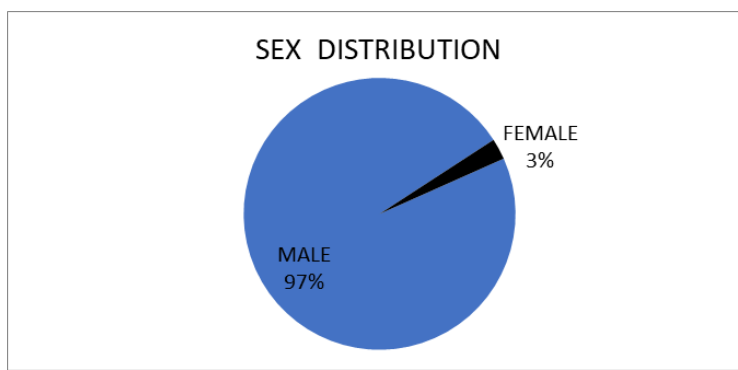


There were total of 39 men patients upto (97.5%) and 1 woman patient upto (2.5%).

"Various studies concluded that ,the prevalence of ischemic heart disease among young women were (≤ 45 years) varies within the range of 0.1-1% of the population".

The increased incidence of acute MI in men due to abnormal lipids and smoking and decreased risk in females is explained by the significant protective effect of estrogens in females demonstrated in many studies.
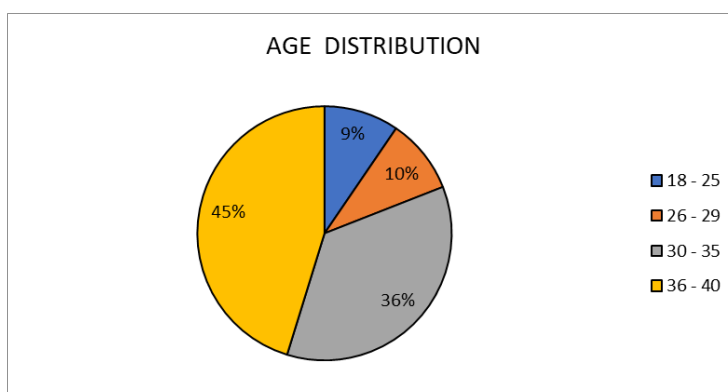


We found that , youngest patient was 21 years old. The men age was 33.7 years and the majority of the patients were from 36-40 years of age group.
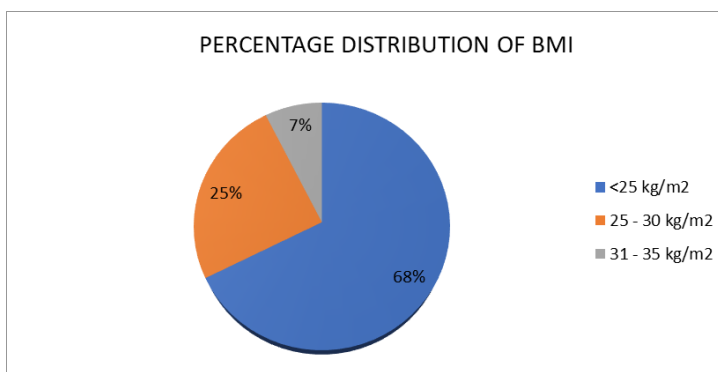


Majority, 27 (67.5%) out of 40 patients had normal BMI Waist circumference was found to be > 90 cm in 7 male patients and > 88 cm in 1 female patient.

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PRESENTING FEATURES:

| FEATURES | NO. OF PATIENTS | PERCENTAGE |
|---|---|---|
| Typical chest pain | 34 | 85% |
| Sweating | 15 | 37.5% |
| Breathlessness | 8 | 20% |
| Vomiting | 5 | 12.5% |
| Epigastric pain | 2 | 5% |
| Diarrhea | 2 | 5% |
| Sudden loss of consciousness | 1 | 2.5% |
| Giddiness | 3 | 7.5% |

RISK FACTORS PROFILE
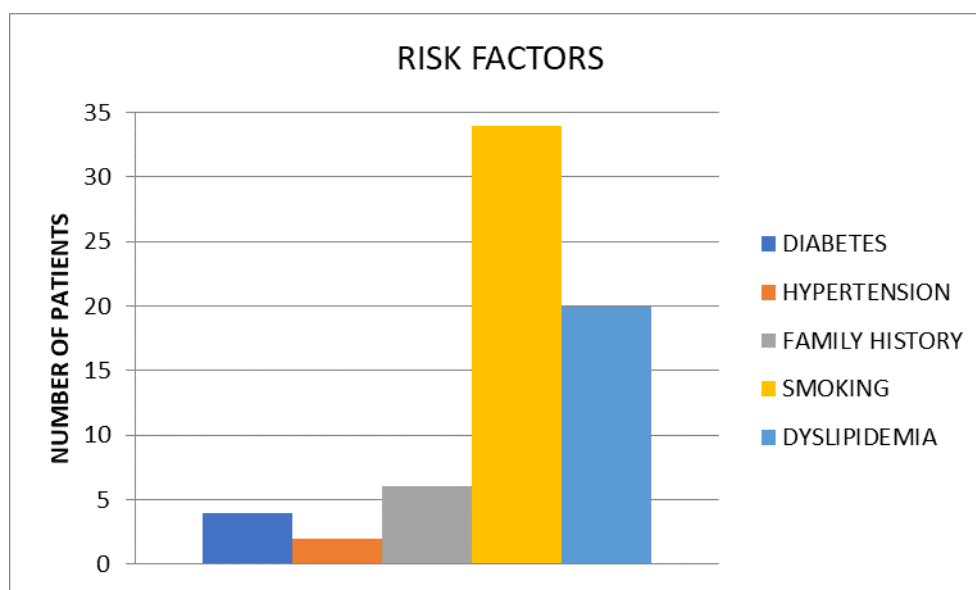


In our study , we found that smoking was the most common risk factor (85%) followed by dyslipidemia (80%) diabetes (10%), hypertension (5%), positive family history of MI (15%).

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| STUDY\n\nrisk factor | Our Study | Goornavar et al. | Al-Khadra et al. | Sricharan et al. | Tamrakar et al. |
|---|---|---|---|---|---|
| Smoking | 85% | 77.4% | 76.9% | 72% | 64.3% |
| Dyslipidemia | 50% | 54.5% | Low HDL -52.3%\n\nHigh LDL –33.8% | 23.5% | 9.6% |
| Diabetes | 10% | 27.2% | 30.8% | 25.3% | 15.6% |
| Family History of IHD | 15% | 36% | 15.4% | 15.6% | 9.6% |
| Hypertension | 5% | 46% | 18.5% | 11% | 27.8% |
| BMI >25 kg/m2 | 25% | 18% | 0 | 0 | BMI > 30kg/m2\n\n4.3% |

In our study, we found that , smoking or any form of tobacco consumption upto (85%) was most common followed by dyslipidemia (50%), positive family history(15%), diabetes(10%) and hypertension(5%). " Similar study found that , smoking upto (76.9%), followed by dyslipidemia (33.8%), and hypertension (18.5%)".[6] "Another study found that, with smoking (77.2%), dyslipidemia (54.5%), and hypertension (45%)".[7] "A study done in 2012 &2013 also showed similar results wherein smoking was most common risk factor upto (70% & 64.3%), respectively".[8,9] " In addition to this, study done on AMI patients <40 years showed to have 73% to 90% risk chances due to history of smoking habit".[10] "Various other studies have also found the presence of high rates of tobacco use among young patients who have AMI, with percentages ranging from 70% to >90%". [11-13]

"Therefore , studies found that smoking cause an increase of fibrinogen, platelet aggregation, impaired the activity of fibrinolytic , decreased the coronary flow and increased the vasospasm". "Furthermore, studies have also concluded that recurrent exposure to cigarettes with subsequent catecholamine surges leads to damage to endothelial cells, finally leading to endothelial dysfunction and injury of the vascular intima". "Various past autopsy studies in young adults have also showed that the extent of fatty streak lesions in the coronary arteries of young adults was higher in smokers than in nonsmokers".

Hence, all these evidences concluded that smoking as the most important modifiable factor in young adults.

It is well known that IHD risk factors synergize the effect of each other, and clustering of risk factors is important in causing premature CAD. In our study 52.5% of the patients had more than one risk factor excluding BMI.

MANAGEMENT

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**PERCENTAGE DISTRIBUTION OF DURATION OF CHEST PAIN**
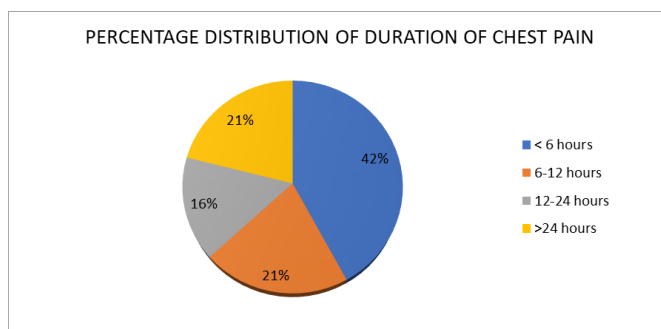


Research found , total of 18 (45%) patients presented within 6 hours of onset of symptoms upto 8(20%) patients presented after 6 hours. All the 24 patients were considered for thrombolysis. 14 patients presented after 12 hours. Among these patients 7 patients were considered for thrombolysis considering risk/benefit ratio, and ongoing symptoms.

**PERCENTAGE DISTRIBUTION  ECG FINDINFS**
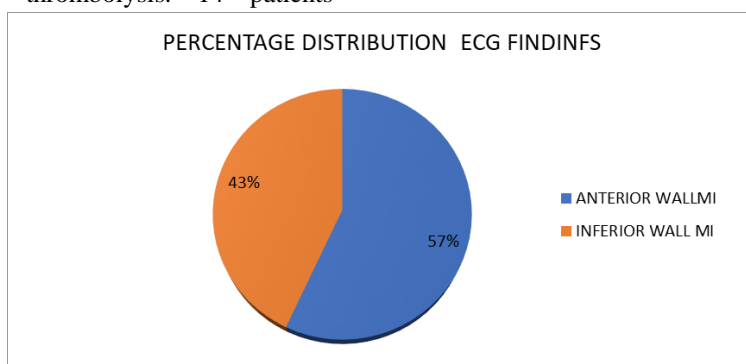


The culprit artery was localized by ECG data is as follows:

23(57.5%) patients presented with anterior wall MI among which 8 patients had antero-septal wall MI in ECG, 5 had anterolateral wall MI, due to occlusion of left anterior descending artery (LAD) before and after septal branches respectively. 4 patients had extensive anterior wall MI in ECG due to proximal LAD occlusion.

One patient had ST segment elevation in both anterior and inferior leads without ST elevation in aVR suggesting wrap around LAD occlusion.

17 patients (43.5%) had inferior wall MI, among which 10 patients had ECG suggestive of left circumflex artery occlusion and rest showed ECG suggestive of right coronary artery occlusion.
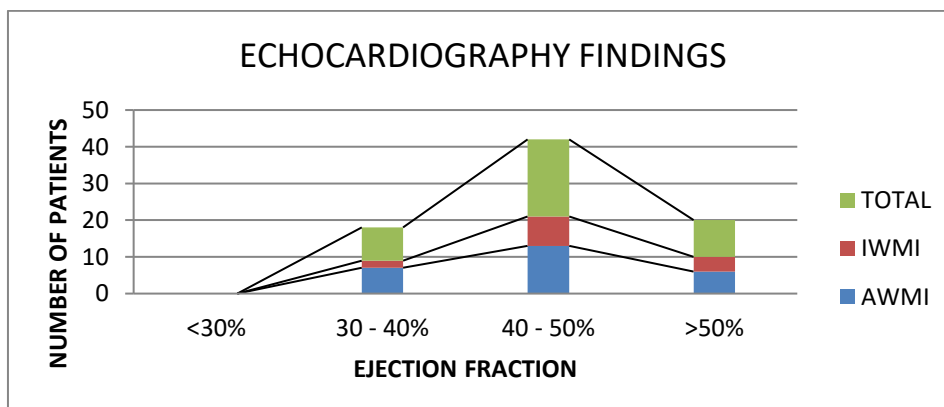


Through our study we found that, for echocardiogram all patients showed regional wall motion abnormality.
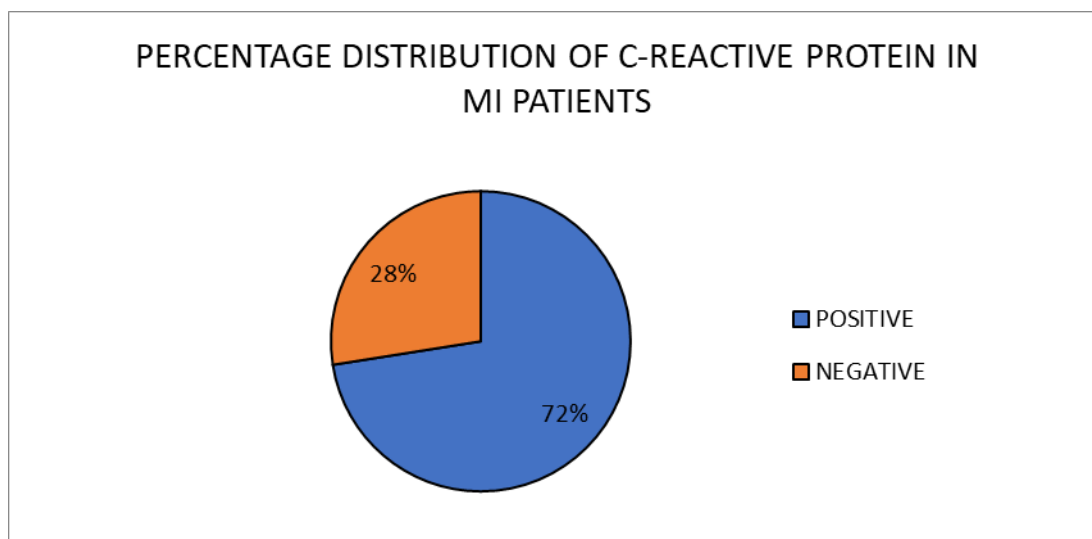
Furthermore, left ventricular ejection fraction was 30-40 % (moderate LV systolic dysfunction) in 9 patients

(22.5%), 41- 50% (mild LV systolic dysfunction) in 21 patients (52.5%) and >50 % (normal) in 10 patients (25%) at the time of presentation.

INFLAMMATORY MARKERS



In our study, association between WBC count and CHD in different populations varied in degrees of baseline risk. Their association appears to be independent to smoking. "Although we found that smoking was also associated with leukocytosis, yet studies have concluded that the predictive value of a high WBC count for CHD is independent of whether patients are smokers". [14]

"Multiple studies concluded presence of increase WBC count  directly associated with increased mortality rates in AMI patients" [15-17] & who undergos percutaneous coronary interventions and CABG. [18]

Additionally, study reveales,  55% of patients with an elevated level of total WBC count.
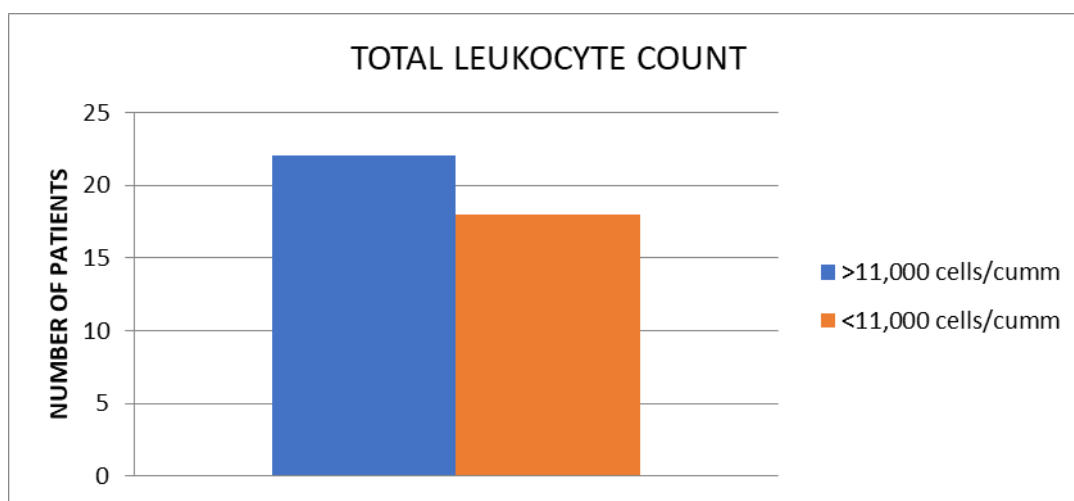


"Several reserachers have concluded that CRP have found to be related with several stages of atherogenesis, from its beginning to acute coronary syndromes". "Additionally , studies have also found the association between pathogenetic role both in CAD and ischemic strok". " Furthermore, according to studies it can be used as diagnostic marker to predict MI and stroke in healthy subjects, as well as their outcomes". "Various past studies also demonstrates that C-reactive protein levels reflect the severity of MI damage & high CRP level is associated with a worse outcome". [19-21]  Studies also concluded

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that , its level can be decrease of CRP with the help of statin therapy.

In our study 72.5 % of patients had an elevated CRP detected by qualitative card tests, showing a positive correlation of atherogenesis and inflammation.

TREATMENT OUTCOME

| TREATMENT OUTCOME | Successful thrombolysis | Unsuccessful thrombolysis | Referral to higher center |
|---|---|---|---|
| NO. OF PATIENTS | 29 | 3 | 8 |
| PERCENTAGE | 75% | 5% | 20% |

COMPLICATIONS

| | Anterior wall myocardial infarction | Inferior wall myocardial infarction |
|---|---|---|
| cardiogenic shock | 2 | 1 |
| Conduction abnormalities | VT/Vf - 2 | Heart blocks - 2 |
| Death due to VT/VF | 1 | |
| Acute renal failure | 1 | |
| Minor bleed after thrombolysis | 1 | |

## 4. Conclusion

1. In most of the young MI patient the commonest mode of presentation remains the typical anginal chest pain. However few present with uncommon symptoms like sweating, epigastric pain.

2. One of the most common risk factor for acute MI in younger patients is smoking which was followed by dyslipidemia in our study, there by indicating the need for awareness about hazards of smoking and early control and management of lipid abnormalities.

3. Commonest type of MI in our study is the anterior wall MI. Complications following MI in our study is about 20%. This may indicate the importance of primary intervention in the young MI patients

4. Majority of the young MI patients are male and smokers. Family history, diabetes mellitus and hypertension is present in minority of the patients.

5. C- Reactive proteins and leukocytosis in majority of young MI may indicate the independent predictive markers for coronary heart disease. These markers can also be used to predict the outcome of MI in young.

6. Most of the patients with young MI respond to thrombolytic therapy as proved in this study. Therefore in the absence of PCI, early initiation of thrombolytic therapy is crucial to the outcome.

7. This study signifies the importance of

a. establishment of Regional Systems of STEMI and PCI care for the effective management of cases

b. educational programs with smoking cessation practiceclinics need to be established.

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