

ORIGINAL ARTICLE

STUDY OF YOUNG ADULTS WITH ACUTE MYOCARDIAL INFARCTION IN REFERENCE TO RISK FACTORS AND SHORT-TERM OUT COME.

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STUDY OF YOUNG ADULTS WITH ACUTE MYOCARDIAL INFARCTION IN REFERENCE TO RISK FACTORS AND SHORT-TERM OUT COME.

ABSTRACT

BACKGROUND: CAD is a major health problem world wide and it's incidence is increasing in young population which is estimated to be 12-16%,in compared to western population ,up to 5%.The current study was carried out to assess the incidence, risk factors and short term out comes of patients with young MI.

METHODOLOGY: All patients aged 40 years or less admitted to ICCU of our hospital, diagnosed with MI were studied. Total 50 patients' data were analysed statistically using computer software.

RESULTS: Incidence of young MI is 13% during study period,more common in males(88%) than females(12%) with mean age of 35 years. In our study anterior wall MI(50%) is more common than inferior wall(34%), hyperhomocysteinemia(100%),smoking (82%) and elevated lipo-protein(78%) are leading risk factors.

CONCLUSION: Hyperhomocysteinemia and smoking are major risk factors for young MI, though short term outcome is relatively uneventful in our study.

INTRODUCTION

Coronary artery disease causing myocardial ischemia is a major health problem worldwide and a leading cause of death not only in western world but also in India nowadays. It was considered to be third common cause of mortality after road traffic accident and cancer.

WHO has estimated 7.22 million deaths due to CHD globally in 2002 and has predicted 11.1 million by 2020. Acute MI is a major contributor for morbidity and mortality. It is an established fact that acute myocardial infarction usually occurs in a patients older than 45 years. However recently more and more patients are found to be suffering from coronary artery disease and having a significant morbidity, psychological stress and financial burden. The risk of CAD in Indian is 3-4 times higher than white Americans, 6 times higher than Chinese and 20 times higher than Japanese. In western population incidence of CAD in young is up to 5% as compared 12-16% in Indians. However in some studies from India incidence of young MI is reported as high as 25-30%. ⁽¹⁾This may be due to changing lifestyle, increasing mental stress, smoking, obesity and consumption of unhealthy junk food along with changing genetic and constitutional factors.

The disease carries significant morbidity, psychological effects and financial constraints for the person & family when it occurs at younger age. In western world, obesity is considered as major risk factor for MI, while in our setup most people from lower socioeconomic class are normosthenic or thin and lean and are still found to be having ischemic heart disease. Many research reports have been published so far highlighting the differences in risk factors, presentation and outcome of myocardial infarction in young patients like presence of classical symptom of angina before MI in elderly people, chronic diseases diabetes and hypertension are common risk factor in elderly while smoking, obesity, hyperhomocysteinemia are more common in young MI patients.

Many clinical studies all over world and in various part of India have been conducted and many unrecognized aspects regarding clinical presentation and risk factor have been reported,

which are very important if utilized in a patient and community education in risk stratification and risk reduction in young population. Hence we consider it worthwhile to study young patients with acute myocardial infarction getting admitted in our tertiary care center to get first hand information regarding risk factor and early outcome of the disease. As this is a short -term study on limited number of patients, the findings may not be extrapolated to general population at large, but this may serve as a pilot projects and may help in future studies on same subject or some other related subjects.

MATERIAL AND METHODS

All the patients aged 40 years or less admitted with acute myocardial infarction in ICCU of our hospital during the period of 22/10/2010 to 4/9/2012 were studied in present work.

The diagnosis of acute MI was considered by presence of 2 of following criteria.

- 1) Ischemic chest pain.
- 2) Evidence of MI on ECG
- 3) Increase in S.CKMB level at the time of admission.

Detail clinical history was recorded in each patient with specific attention to the risk factor for coronary artery disease.

All patients were examined thoroughly and investigations like ECG, Blood Sugar , Blood urea and creatinine level , Serum CPK-MB level, S.Lipid profile, S.Lipoprotein(a),S.Uric acid level, S.Homocysteine level done in all patients.

As this is a cross sectional observational study only, we did not intervene in treatment of the Patients and they were treated as per the opinion of the consulting doctor in charge. But we

did observe the patient for development of any complication and outcome at the time of discharge from hospital.

Observation of the study were analyzed statistically by appropriate software .

OBSERVATION

Total 384 patients were admitted with acute MI in our ICCU during the period of 22/10/2010 to 4/9/2012. Among them 50 patients (13%) were below the age of 40 years and were studied in present study. We observed all the 50 patients for risk factors and outcome during their hospital stay and observations are recorded as follows:

Table I. Showing age and gender distribution of patients in present study.

Age	Gender	
	Male	Female
20-30	5(10%)	-
30-40	39(78%)	6(12%)

As seen in above table, we found young MI as more of a disease of male gender (88%). 10% of patients in our study were below 30 years of age - all of them were males. Our youngest patient was 20 year old male patients. The mean age of our patients was 35+/-4.62 years. M:F in our study was 7.1:1.

Table II: Showing type of MI

Type of MI	Male	Female	Total
Anterior wall	21(42%)	4	25(50%)
Anterolateral wall	4(8%)	2	6(12%)
Anteroseptal wall	2(4%)	-	2(4%)
Inferior wall	17(34%)	-	17(34%)

Majority of young patients had anterior wall MI (50%) including all female patients.

However the difference between anterior and inferior wall MI was not statistically significant as 34% had inferior wall MI.

Table III : Showing killip's classification.

KILLIP CLASS	No.	Percentage
I	45	90
II	5	10
III	-	-
Iv	-	-

None of the patients in present study was in class III or IV, majority of them were in class I as shown in table.

Table 4: Showing presence of risk factor for CAD in patients of present study:

Risk factor	Male	Female	Total
Elevated S.Homocystine	44(88%)	6(12%)	50(100%)
Elevated Lipoprotine(a)	39(78%)	6(12%)	45(90%)
Smoking	41(82%)	-	41(82%)
Family h/o IHD at young age	7(14%)	-	7(14%)
Obesity	15(30%)	3(6%)	18(36%)
Elevated S.uric acid	13(26%)	5(10%)	18(36%)
Tobacco chewing	14(28%)	-	14(28%)
History of HTN	1(2%)	1(2%)	2(4%)
History of DM-II	1(2%)	-	1(2%)
Previous h/o IHD	1(2%)	-	1(2%)

All 50 of our patients had hyperhomocysteinemia with mean value of 45.14 \pm 12.36 ranging between 16 to 90. Second most common risk factor was elevated lipoprotine(a) level (90%) followed by smoking(82%), while p/h/o HTN, DM ,IHD were found in few patients only.

All our patients who smoked, were heavy smokers (on an average 300 pack years of smoking).

All 6 female had dyslipidemia, hyperhomocysteinemia and 5 of them had hyper uricemia also.

Obesity is an important risk factor for CAD, was present in 38% of the patients with mean value of BMI 45.14+/-12.37, ranging between 16.54 TO 31.1.

Total S. Cholesterol>200mg% was found in 58% of patients (mean value 206.1+/-19.2420) while S.LDL>100mg% and S.HDL<40mg% were present in 66% and 84% respectively.

Table 5: Categorization of homocysteine level

S.homocysteine level(umol/L)	Male	Female	Total
Moderate(10-30)	3(6%)	-	3(6%)
Intermediate (31-100)	41(82%)	6(12%)	47(94%)
Severe(>100)	-	-	-

All 50 patients had hyperhomocystinemia (100%), majority of them were in intermediate class (94%), including all females.

OUTCOME AND COMPLICATIONS

All patients were observed in hospital for a period of about 7 to 10 days. immediate outcome in form of complication and /or death was recorded in all patients.

Though majority of our patients had anterior wall MI which is considered to be having comparatively worse prognosis, immediate short term outcome in term of mortality and complication was found to be more or less uneventful in all but two patients in our study had Ventricular tachycardia which was reverted with treatment. None of our patients died due to MI during Hospital stay and all of them had good uneventful recovery at the time of discharge.

DISCUSSION

This is an observational study of clinical profile of 50 patients aged 40 years or less admitted with diagnosis of acute MI.

Incidence of young MI in our study duration from 22/10/2010 to 4/9/2012 was found to be 13%. Klein et al noted that clinically manifested CAD in the young adult is relatively uncommon and, implied that these patients are atypical of the general population. However, it must be noted, those patients who come to medical attention owing to symptomatic disease may well represent the tip of iceberg when considering manifested and sub clinical disease together. ⁽²⁾ In this study MI in young was found to be more common in males (88%) with the M:F ratio of 7.1:1. Other studies of young MI, done by chun pong wong et al(96,6%), Al-khadra AH (90%) have also conclude that Mi in young is predominantly disease of men. ^(3,4) This finding corroborates the fact that circulating ovarian hormones i.e estrogen, progesterone and other physiological differences like presence of less amount free radicals in circulation due to periodic iron loss in menstruation dose have protective role against CAD.

In our study Majority of patients (90%) were in the age of 31-40 years, with the mean age of 35 years.

Majority of patients were found to be presented with typical ischemic chest pain in our study with an average duration of 4 hours. Lija chen et al in their study conclude that younger patients with CAD commonly present with an ACS without history of angina. ⁽⁵⁾ it has been reported that young patients had most of the time plaque rupture and acute coronary embolisation with less collaterals as compared to elder CAD patients , as DM, HTN ,Dyslipidemia and resultant atherosclerosis, would not to be there or if present, comparatively of lesser duration thus collateral vessels would not be opened. This may results in sudden cardiac death rather than clinical presentation of recurrent angina culminating in to MI as in elderly patients. This also might be the cause for less number of young patients coming to

hospital and hence the Incidence of 13% may be a false projection. Further community based studies required like verbal autopsy to find out the cause of death may be complimentary to find out exact prevalence.

Hyperhomocystenemia (100%), elevated lipoprotein (a) level and smoking (82%) are most common risk factors found in present study. among 50 patients, 42(94%) of our patients had intermediate level of homocysteine, while study done by Naveed et al found that 58.3% patients had moderate and 41.6% had intermediate level of homocysteine. This mismatching results might be due to small numbers (12) of patients in their study. Very few of the patients had other risk factors like family h/o IHD, elevated uric acid, p/ h/o HTN, p/ h/o DM. the findings are consistent with other studies. However while chun pong wong found hypertension (28.5%) as second most common risk factor after smoking. ^{(6) (3)}

This study pointed that smoking and obesity are important and more prevalent risk factors and both are modifiable and preventable. So there is need to increase awareness among young population, stressing on modifiable risk factors in form of healthy diet, exercise, cessation and avoidance of smoking and screening for risk factors in those at high risk at an early age rather than neglecting this as a disease of an old age.

In this study , anterior wall MI(50%) was most frequent location of MI as notified by other researchers also. AL khadra AH has reported heart failure and cardiogenic shock(4.6%) as complications in young MI patients, but in this study anterior wall MI was 92.3%. ⁽⁴⁾

However, we observed neither fatal outcome nor any significant complication in any of our patients with anterior or inferior wall MI, despite the fact that anterior wall MI is associated with higher morbidity and mortality. Further long term studies with more number of patients are required to conclude emphatically on the outcome and severity of MI in young patients, as it has been reported in many other studies that acute MI in young patients had substantially worst inhospital outcome in form of complications like heart failure , serious ventricular

ectopic activity and inhospital death. While none of our patients had significant HF, as we observed that all our patients were in killip class I and II only.

Morccetti et al concluded that survival after MI is influenced by multiple factors of which age stands out as major nonmodifiable predictor of long term prognosis, while prognosis is excellent in young MI survivors⁽⁷⁾

Chronic diseases like HTN, DM, Dyslipidaemia etc are not prevalent in young patients as elderly, because they will take longer time for atherosclerosis of coronary arteries. But now because of obesity, they occurs at earlier age hence it is important to diagnose and treat these conditions at an early stage before they can lead to such devastating complications

Hyperhomocysteinemia and hyperuricemia are another important factors to be addressed earlier in life as simple measures like daily supplement of folic acid and increased amount of calcium and vitamin D3 in diet many help of to delay/prevent these two abnormalities and in turn CAD.

SUMMARY AND CONCLUSION

- (1) Out of 384 patients admitted with acute MI during a period of 22/10/2010 to 04/09/2012, 50 were below the age of 40 years. So the incidence in our setup is 13%.
- (2) Young MI is more common in males (88%), with mean age of 35 years, as compared to females(12%).
- (3) Anterior wall MI (50%) is more common than inferior wall MI (34%), and 90% of patients were in killip class I suggesting less prevalence of HF and pulmonary edema in young patients.
- (4) Hyperhomocysteinemia (100%) is a leading risk factor in young MI patients followed by smoking (82%) and elevated lipoprotein (a) level (78%).

(5) Short term outcome in all 50 patients were relatively uneventful, only 2 patients had ventricular tachycardia treated successfully. Overall no mortality has been recorded during hospitalization.

It is important not only to diagnose early and treat adequately, acute MI in young, it is also essential to identify, prevent and treat risk factor at primary and secondary level. Patients with family history should especially be screened for risk factors and life style modification with restriction of smoking, tobacco, weight reduction, exercises, avoidance of stress and indulgence in healthy diet rather than junk food are the most important health educational advice required to be given to young and adolescent population rather than to reserve for elderly population.

However further long term comparative studies with more number of patients would definitely help to establish and extrapolate these findings to community at large.

ABBREVIATIONS

ACS- ACUTE CORONARY SYNDROME

CAD-CORONARY ARTERY DISEASE

CHOL-CHOLESTEROL

CRP-C REACTIVE PROTEIN

CVD-CARDIO VASCULAR DISEASE

DM-DIABETES MELLITUS

ECG-ELECTROCARDIOGRAM

HF-HEART FAILURE

HDL-HIGH DENSITY LIPOPROTEIN

HTN-HYPERTENSION

IHD-ISCHEMIC HEART DISEASE

JVP-JUGULAR VENOUS PRESSURE

LDL-LOW DENSITY LIPOPROTEIN

LP(a)-LIPOPROTEIN (a)

MI-MYOCARDIAL INFARCTION

O.C.PILLS-ORAL CONTRACEPTIVE PILLS

PAI-PLASMINOGEN ACTIVATOR INHIBITOR

SLE-SYSTEMIC LUPUS ERYTHMATOSUS

TG-TRIGLYCERIDE

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