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Role of Clinical Pharmacist in the Management of Myocardial Infaraction: A Prospective Observational Study

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ABSTRACT

The aim of the present study was to analyze myocardial infarction- Age related risk factors, complications and management.Valuation of age related risk factors in MI patients, identification of frequent type of myocardial infarction, Evaluating the effectiveness of thrombolytic therapy and primary intervention in patients with MI, Assessment of complications of MI and Studying the impact of concomitant diseases on different types of complications. A Prospective observational case series study with 130 cases of patients with myocardial infarction and this study were conducted in department of cardiology in maharaja institute of medical sciences and our work conducted for a period 6 months and we have strictly adhere the Inclusion and exclusion criteria. We concluded that males were more prone to develop MI than females. Incidence of MI was high in age group 51-60 yrs. Cigarette smoking was identified as a major risk factor indicating that life style plays a dominant role than concomitant disorders for early incidence of MI in present generations. Younger population were predisposed to unhealthy life style like smoking, alcohol, fatty diet and we also find out that TLT was effective in treatment of MI. Also, TLT reduced the need for PTCA, and the reason behind subjects required PTCA even after receiving TLT was advanced age. Older subjects were primarily treated with PTCA.

Key words:
Myocardial Infarction,
130 Cases, Concomitant Diseases,
Life Style Management, Six Months.

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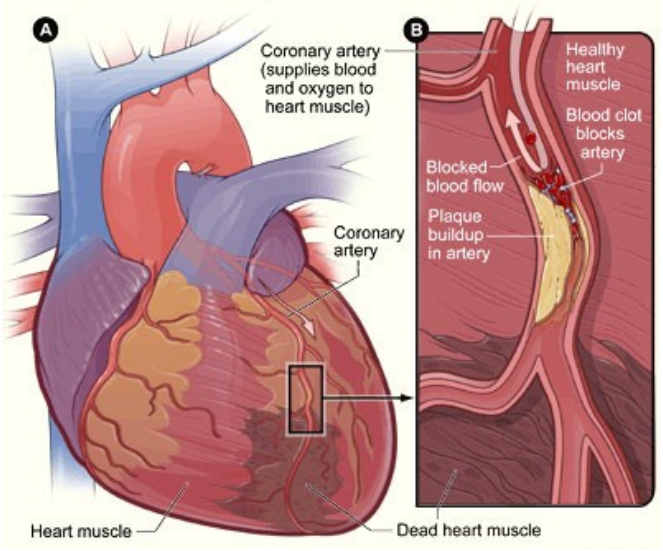
INTRODUCTION

Acute myocardial infarction with or without ST-segment elevation (STEMI or non-STEMI) is a common cardiac emergency, with the potential for substantial morbidity and mortality. The third universal definition of myocardial infarction, Myocardial infarction (MI), commonly known as a heart attack, is defined pathologically as the irreversible death of myocardial cells caused by ischemia. Clinically, MI is a syndrome that can be recognized by a set of symptoms, chest pain being the hallmark of these symptoms in most cases, supported by biochemical laboratory changes, electrocardiographic (ECG) changes, or findings on imaging modalities able to detect myocardial injury and necrosis[1].



The myocardium receives its blood supply from the two large c oronary arteries and their branches. Occlusion of one or more of these blood vessels (CORONARY OCCLUSION) is one of the major causes of myocardial infarction. The occlusion may result from formation of a clot that develops suddenly when an atheromatous plaque ruptures through the sub layers of a blood vessel, or when the narrow roughened inner lining of a scleroses artery leads to complete thrombosis.Coronary artery disease is the most common type o f heart disease in the United States and many other countries. The risk rises rapidly with age, women tending to develop the disease 15 to 20 years later than men[2].

Incidence of myocardial infarction

Worldwide, about 15.9 million myocardial infarctions occurred in 2015[3]. The incidence of MI in India is 64.37/1000 people these results call for several comments[4]. In the ARIC study, no overall change was detected in the incidence of hospitalized myocardial infarction between 1987 and 1994[5].There were divergences in the trends by race and sex with an alarming increase in myocardial infarction among black women. In the Minnesota Heart Survey, between 1985 and 1995, the rates of hospitalization for acute myocardial infarction declined[6, 7]. In both MHS and ARIC, published data do not include persons older than age 74 and is thus not accounting for a growing segment of the population. In the Worcester Heart Attack Study, analyses spanning a 20-year period until 1995 indicated qualitatively flat trends in incidence from the mid 1980s to the mid 1990s[8]. The trends between 1975–88 underscored the importance of examining age and sex-specific patterns in addition to overall rates. Indeed, larger declines in myocardial

infarction incidence were noted among elderly individuals along with an increase in incidence among some but not all age groups in women. In Olmsted County, there was little change in the incidence of hospitalized myocardial infarction between 1979 and 1998. However, important age and sex-specific patterns were noted as trends diverged with an increase in myocardial infarction incidence in women and the elderly [9, 10]. It is important to underscore that in the Olmsted County Study, like in the Worcester Heart Attack Study, the absence of an upper age limit enables the detection of age and sex-specific disease patterns that denote a shift in the burden of myocardial infarction towards women and the elderly. These findings have important clinical and public health implications.

Data from the Framingham Heart Study, which pertain to earlier time periods since the inception of the cohort, indicated that the incidence of myocardial infarction and other manifestations of coronary disease declined over a twenty year period starting in the 1950's. The Corpus Christi Study reported important data comparing and contrasting the incidence of myocardial infarction in Mexican American and non-Hispanic White men and women indicating that the incidence of myocardial infarction was greater among Mexican Americans than non-Hispanic Whites for both men and women. MONICA reported seminal data illustrating a wide variation in the incidence of myocardial infarction and other coronary events across populations. Incidence of myocardial infarction in selected community studies.

AIM AND OBJECTIVES

AIM

To assess certain the age related risk factors and management in patients with myocardial infarction.

Objectives

- Valuation of age related risk factors in MI patients.
- Identification of frequent type of myocardial infarction.
- Evaluating the effectiveness of thrombolytic therapy and primary intervention in patients with MI.
- Assessment of complications of MI.
- Studying the impact of concomitant diseases on different types of complications.

METHODOLOGY

Study Design

Prospective observational case series study.

Study Population

130 cases of patients with myocardial infarction.

Study site

The study was conducted in department of cardiology in maharaja institute of medical sciences.

Study period

The study was conducted for a period 6months.

Inclusion Criteria

- Patients with MI aged above 20years.
- Patients with any type of myocardial infarction.
- Patients with complications of myocardial infarction.

Exclusion Criteria

- Patients with MI aged below 20years.
- Patients with previous history of MI.

Study Content:

The project consists of the following steps:

a. Obtaining the permission from the ethics committee in MIMS.
b. Enlisting the patients into the study as per inclusion criteria.
c. Assessing the patients according to objectives.
d. The data would be analysed and interpreted to produce fruitful results.

Place of Investigation

Collection of case information would be carried out at Maharaja Institute of Medical Sciences, Vizianagaram.

RESULTS

A total of 130 patients diagnosed with myocardial infarction were included in our study.

Several parameters were assessed, and results were produced with emphasis on age- related risk factors, complications and their association with comorbid conditions, management strategies in MI patients.

Incidence of Mi in Different Age Groups

Patients aged 30 years and above were categorised into 5 different age groups (30-40, 41-50, 51-60, 61-70, >70). Results of our study showed majority of the subjects in the age group 51-60yrs with 40 (30.76%) subjects followed by 37 patients (28.46%) in age group 61-70yrs with minimal difference. The subjects in the age groups 30-40yrs, 41-50yrs and >70yrs numbered 13 (10%), 26 (20%) and 14 (10.76%) respectively.

Tab 1: Incidence of Mi in Different Age Groups

Age group (yrs)	No. of subjects	% of subjects
30 – 40	13	10%
41 – 50	26	20%
51 – 60	40	30.76%
61 – 70	37	28.46%
> 70	14	10.76%

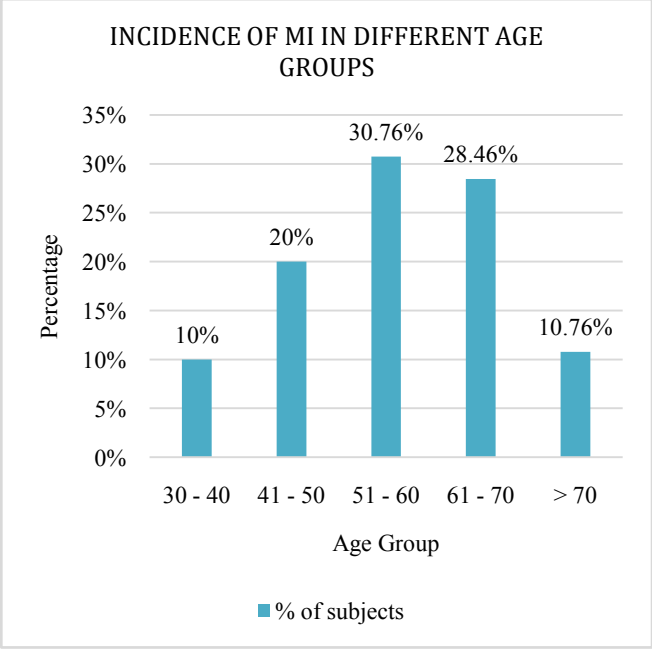


Fig 1: Incidence of Mi in Different Age Groups

GENDER

Like in most of the studies on MI, male subjects in our study were significantly higher (77%) than female subjects (23%).

Tab 2: Gender Analysis of MI Patients

Gender	No. of subjects	% of subjects
Male	100	77%
Female	30	23%
Total	130	100%

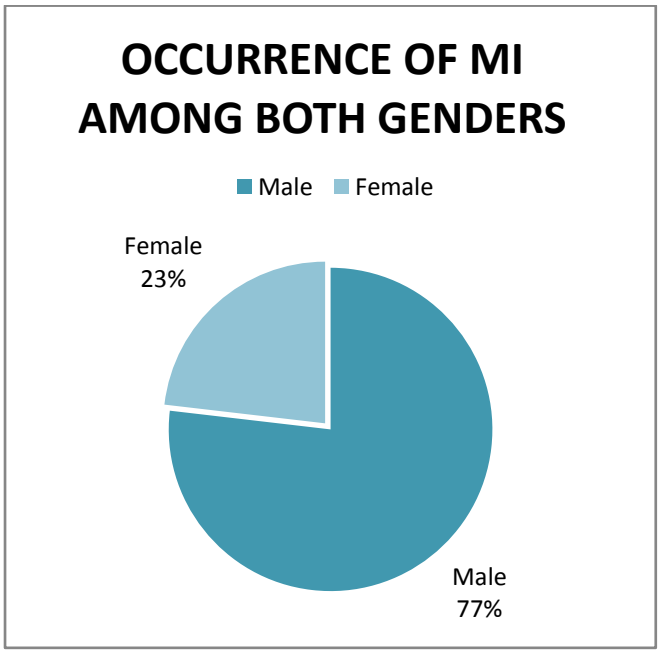


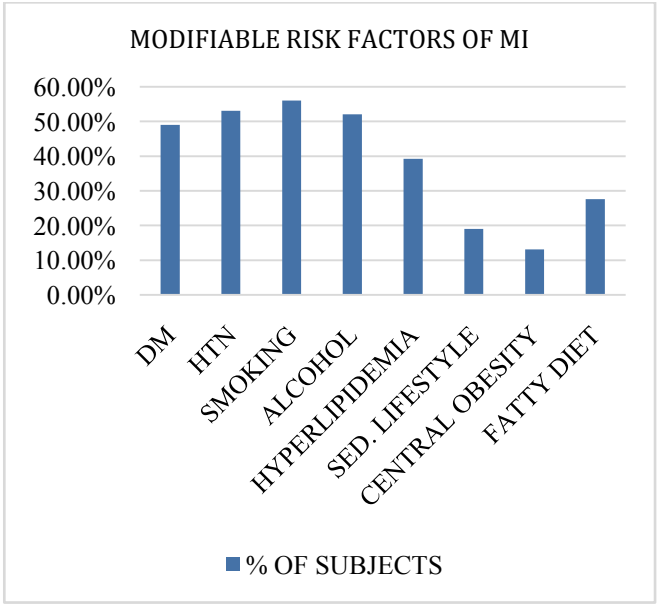
Fig 2: OCCURRENCE OF MI AMONG BOTH GENDERS

RISK FACTORS

Among the modifiable risk factors, cigarette smoking was identified as the leading risk factor found in 56% (74 of 130) of study population accompanied by hypertension (53.07%) and alcohol (52.05%) having similar significant impact. Irrelevant to previous studies, alcohol was found as one of the major risk factor that lead to MI. The other risk factors diabetes mellitus, hyperlipidaemia, sedentary lifestyle and fatty diet were found in 49.04%, 39.20%, 19% and 27.60% of study population respectively. The least significant risk factor was central obesity found in 13.07% of total subjects.

Tab 3: Modifiable Risk Factors of Myocardial Infraction

Risk Factors	No. Of Subjects	% Of Subjects
Diabetes Mellitus	55	49.04%
Hypertension	63	53.07%
Smoking	74	56.00%
Alcohol	59	52.05%
Hyperlipidaemia	51	39.20%
Sed. Lifestyle	22	19%
Central Obesity	17	13.07%
Fatty Diet	36	27.60%



NON MODIFIABLE RISK FACTOR

Family history of CAD was found in 31(24%) of total study population.

Tab 4: Non Modifiable Risk Factors of MI

Family History	No. Of Subjects	% Of Subjects
Yes	31	23.84%
No	99	76.15%

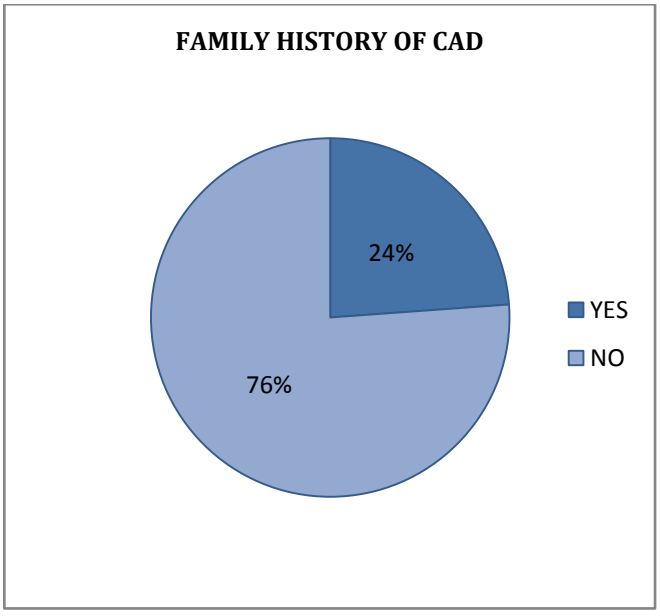


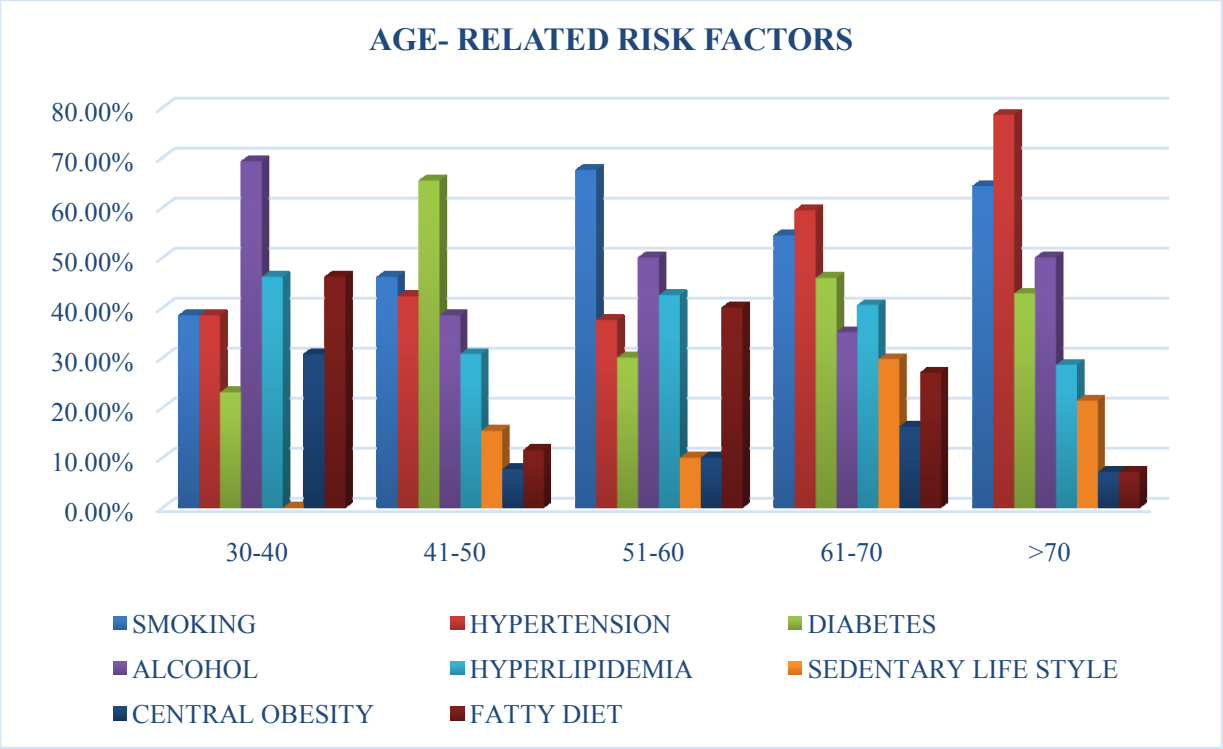
Fig 4: Family History of CAD

AGE RELATED RISK FACTORS

A noteworthy finding in our study was identifying the prevalence of risk factors in specific age groups. The risk factors were assessed individually in different age groups (categorised earlier). The leading risk factor in age group 30-40yrs was found to be alcohol, present in 69.23% of total subjects, in age group 41-50yrs was diabetes (61.38%),in age group 51-60yrs was smoking (67.50%), in age group 61-70yrs is hypertension (59.45%) and in age group above 70yrs was hypertension(78.57%).

Tab 5: Age Related Risk actors Distribution

Age [Yrs]	Smoking	HTN	DM	Alcohol	HLPD	Sedentary Life Style	Central Obesity	Fatty Diet
30-40	38.46%	38.46%	23.07%	69.23%	46.15%	0%	30.76%	46.15%
41-50	46.15%	42.30%	65.38%	38.46%	30.76%	15.38%	7.69%	11.53%
51-60	67.50%	37.50%	30%	50%	42.50%	10%	10%	40%
61-70	54.45%	59.45%	45.94%	35.13%	40.54%	29.72%	16.21%	27.02%
>70	64.28%	78.57%	42.85%	50%	28.57%	21.42%	7.14%	7.14%



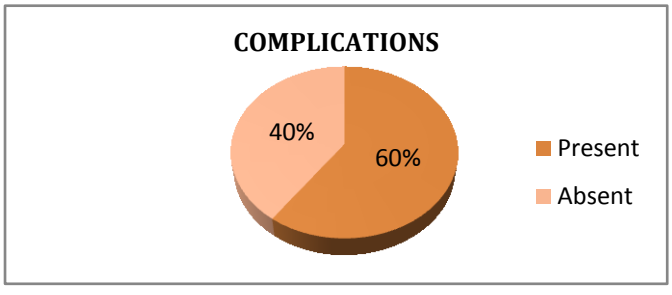
Graph 5: Age Related Risk actors Distribution

COMPLICATIONS

In the total study population, 60% of the subjects had complications.

Table 6: Assessment of Complications

Complications	No. of subjects	% of subjects
Present	78	60.00%
Absent	52	40.00%



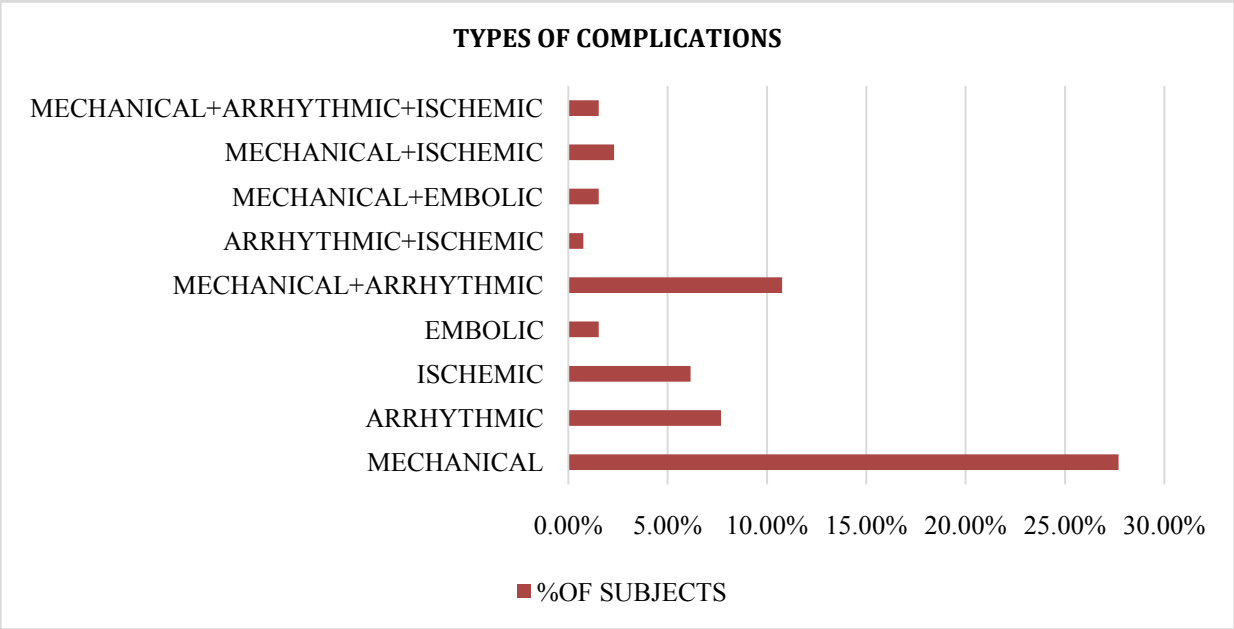
Graph 6: Assessment of Complications

TYPES OF COMPLICATIONS

Four types of complications were found in study population. Among those who had complication, mechanical complications were predominantly seen in 27.37 % of total population some of them had multiple complications. Mechanical +arrhythmic complications were seen in 10.76% of study subjects, arrhythmic in 7.69%, ischemic in 6.15%, mechanical +ischemic in 2.30%. Embolic, mechanical +embolic and mechanical +arrhythmic+ischemic complications were seen in similar percentage of subjects (1.53%).

Tab 7: Types of Complications

Complication Type	No. of Subjects	%Of Subjects
Mechanical	36	27.69%
Arrhythmic	10	7.69%
Ischemic	8	6.15%
Embolic	2	1.53%
Mechanical+Arrhythmic	14	10.76%
Arrhythmic+Ischemic	1	0.76%
Mechanical+Embolic	2	1.53%
Mechanical+Ischemic	3	2.30%
Mechanical+Arrhythmic+Ischemic	2	1.53%



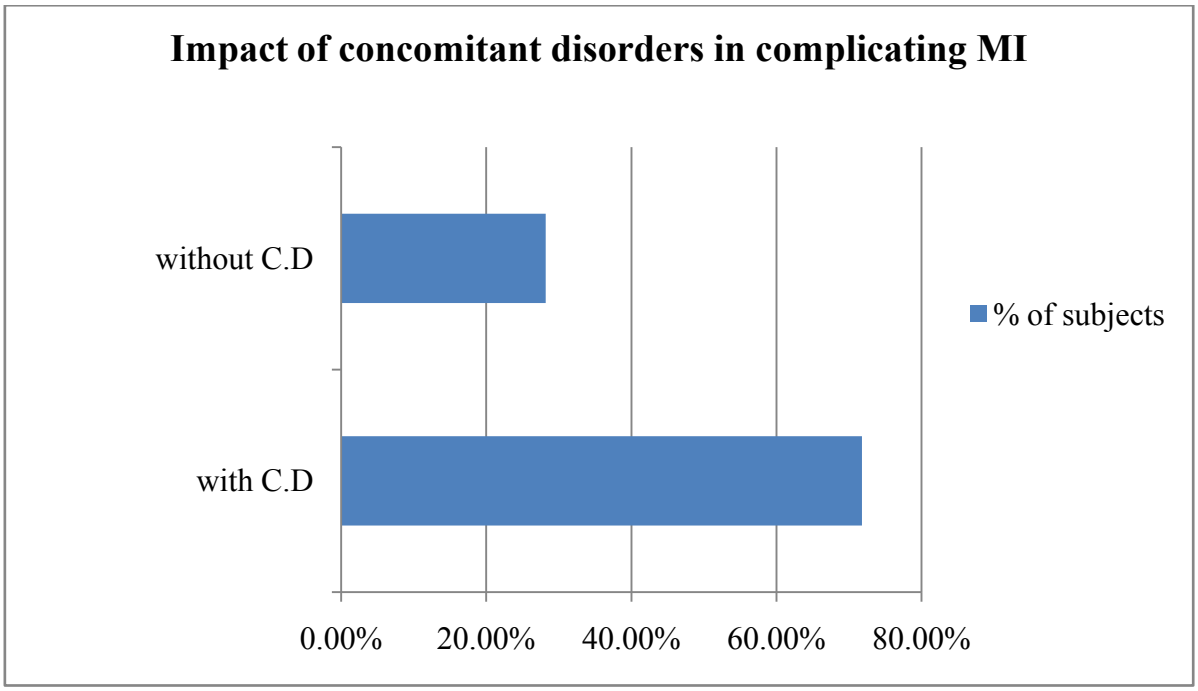
Graph 7: Types of Complications

CONCOMITANT CONDITIONS AND COMPLICATIONS

Concomitant diseases had a significant effect on MI subjects resulting in certain kinds of complications that increase the risk of mortality. Hypertension, diabetes mellitus and hyperlipidaemia were common concomitant conditions that worsen the prognosis of MI. Concomitant diseases were found in 72% of subjects with complications.

Tab 8: Concomitant Conditions and Complications

Pts. With Complications	% of subjects
with C.D	71.79%
without C.D	28.21%



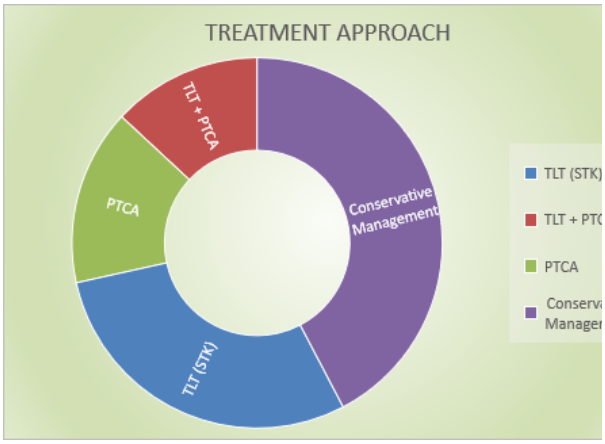
Graph 8: Concomitant Conditions and Complications

TREATMENT APPROACH

Different approaches were used in treating our study population. Among total population [130],37 subjects [28.40%] were treated with TLT alone and 20 subjects (15.3%) directly underwent PTCA for reperfusion. Those who underwent PTCA even after receiving TLT were 17 (13.07%). Remaining patients were given conservative management alone.

Tab 9: Treatment Approach

Treatment	No. of subjects	% of subjects
TLT (STK)	37	28.40%
TLT + PTCA	17	13.07%
PTCA	20	15.3%
Conservative Management	57	43.07%



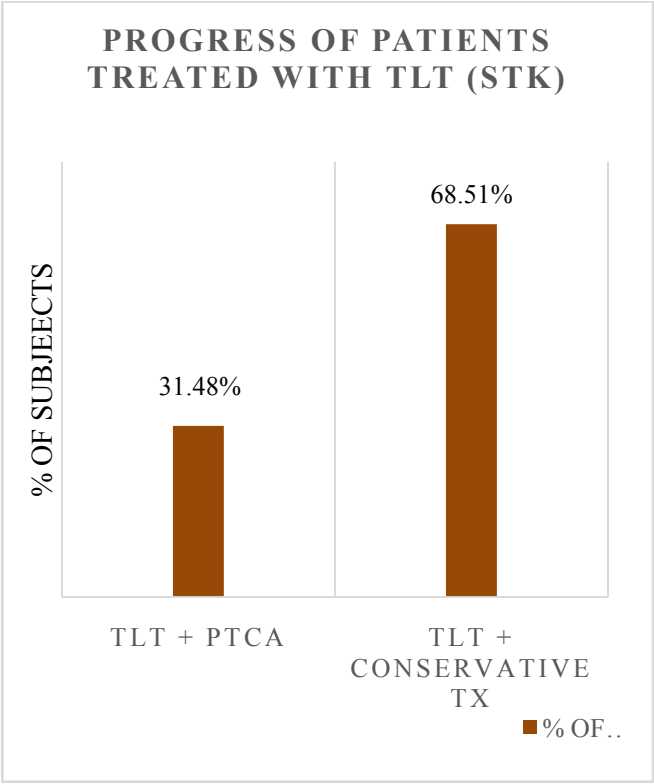
Graph 9: Treatment Approach

ROGRESS OF PATIENTS TREATED WITH TLT (STK)

Among those treated with TLT, 31.48% (17) of the subjects progressed to PTCA and the remaining of them 68.51% (37) were given conservative therapy. This demonstrates the efficacy of TLT.

Tab 10: Progress of Patients Treated With TLT (STK)

Treatment	No. of Subjects	% Of Subjects
TLT + PTCA	**17**	**31.48%**
TLT + CONSERVATIVE TX	**37**	**68.51%**



Graph 10: Progress of Patients Treated With TLT (STK)

DISCUSSION

The aim of the present study was to analyze myocardial infarction- Age related risk factors, complications and management among 130 subjects.

Firstly, discussing about association between age and MI, most of the subjects hospitalized with MI were of age 51-60 years [30.76%] followed by 61-70 years [28.46%], 41 -50 years [20%], >70 years [10.76%], 30 – 40 years [10%]. Subjects in our study were predominantly males, because of specific risk factors like smoking and alcohol. Most of the patients had ST elevated MI [93%]. Among those with STEMI, anterior wall MI was noted in 56% of subjects followed by inferior wall MI [20.66%], posterior-inferior [8.26%], antero-lateral [7.44%], anterio-inferior [3.31%], lateral and posterior [1.65%], inferio-lateral [0.83%].

Smoking was found as major risk factor accounting for upto 74 [56%] of total 130 MI subjects. Hypertension [53%], diabetes mellitus [44%] and hyperlipidemia [39%] were significantly more common in MI subjects. Alcoholism was found in half of the study population [56%] showing a significant impact over occurrence of MI. Sedentary lifestyle [19%], central obesity [13%] and unhealthy diet [27%] were among the other risk factors which are less significant. Family history was present in 23% of subjects. There were different leading risk factors for MI in different age groups. Younger patients were predisposed to live an unhealthy lifestyle (alcohol, fatty foods). Diabetes was most common in group-2(41-50yrs). Proportion of hypertension increased from younger to older patients and it is the major risk factor in subjects of age 61years and above.

Concomitant disorders had significant effect on MI, complicating 43% of total MI population. This shows the need to control of these conditions that include hypertension, diabetes mellitus, hyperlipidemia which improve patient lifespan.

Association between location of infarct and type of conduction blockade was studied. AV block was mostly found in patients with inferior infarct, IV block that includes RBBB, LBBB, LAFB, LFFB and bifasicular block was found mostly in patients with inferior infarct. Treatment of MI consists of 2 approaches, one is TLT and the other is PTCA (invasive therapy). These two were given to patients based on specific criteria.

In this study TLT was given to 41% of patients. TLT was found to an effective treatment, as only 31% of those who were given TLT required PTCA. 15% of total population underwent PTCA alone due to contraindication to TLT or other reasons like hospitalized within defined window period.

CONCLUSION

In our study we concluded that males were more prone to develop MI than females. Incidence of MI was high in age group 51-60 yrs. Cigarette smoking was identified as a major risk factor indicating that life style plays a dominant role than concomitant disorders for early incidence of MI in present generations. Younger population were predisposed to unhealthy life style like smoking, alcohol, fatty diet. There was a significant increase in the proportion of hypertension with increasing age. Concomitant disorders had a significant effect on development of complications posing an increased risk of mortality in MI patients. we found out that TLT was effective in treatment of MI. Also, TLT reduced the need for PTCA, and the reason behind subjects required PTCA even after receiving TLT was advanced age. Older subjects were primarily treated with PTCA.

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