International Journal of Pharmaceutical Research and Applications
Volume 9, Issue 1 Jan-Feb 2024, pp: 786-794www.ijprajournal.com ISSN: 2249-7781

An Observational Study on High Risk of Myocardial Infraction in Diabetes Mellitiusand Itsprevention.

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Submitted: 10-01-2024 Accepted: 20-01-2024

ABSTRACT

Background:-Myocardial infarction (MI) is the primary causeof death in type 2 diabetes mellitus patients, and the risk of major coronary events in type 2 diabetes mellitus patients without a history of coronary artery disease (CAD) is equal to that in patients with CAD, with the >20% risk of a first MI within 10 years of developing type 2 diabetes mellitus. We conduct this study to identify the patients who are at higher risk of developing myocardial infarction in patients with type 2 diabetes mellitus and noted down there preventive measures.

METHODOLOGY The study was conducted in Olive Hospital Nanalnagar for a period of 6 months . It is specialised multi-speciality Hospital. A total of 200 patients of different age groups were considered . Informed consent was obtained for all the subjects. Enrolled in the study where from in-patients and out-patients department . The study shows the high risk of myocardial infarction in diabetes mellitus patients and its prevention. The data was assessed by using the study .

RESULTS The study on high risk of MI in DM patients and its prevention out of 200 patients , 139(69.5%) where found to be males and 61(30.5%) was found females . The patients with age group ranging from 46-60 years which is late middle aged in both males and females were suffering from MI . It has been shown that 139 males among 200 and 61 females among 200 . Among 200 patients the 129 had hypertension, 46 patients DM around 10,13,15,10 showed Thyroid , liver diseases, renal disease and COPD

CONCLUSION We conducted an observational study on myocardial infarction with diabetes mellitus patients for a period of 6 months. we conducted our study by taking sample size of 200 patients out of which 69.5% were male and 30.5% were female. according to the age wise distribution, patients in the range of 46-60 years were more in number suffering with myocardial infarction many patients also have co-morbid conditions like hypertension, diabetes mellitus hypothyroidism and others

KEYWORDS:-Hypertension, Diabetes mellitius, Congestive Cardiac Failure, Myocardial Infarction, Coronary Artery Disease, Arrhythmia.

I. INTRODUCTION

Myocardial infarction is a cause of morbidity and mortality all over the world which is more common in patients with diabetes mellitus than those without diabetes. Acute myocardial infarction is with a higher incidence of critical complications, more frequent mortality, in spite of all possible care and clinical presentations. Thus there are requirements for special attention for diagnosis and skill in management. There is epidemiologic and clinical data to suggest there is at least twice common in men and four fold atherosclerotic coronary artery diseases in women with diabetes. According to records, myocardial infarction (MI) and sudden death is estimated to be greater by 50% in male and 150 to 300% in female, mean while silent MI data during autopsy of patients with hospital record is 3 times more common in diabetes patients compared to others. It is seen in premenopausal female and in males in their 4^{th} an 5^{th} decades of life.

The process of atherosclerosis forms the plague which is responsible for acute coronary syndrome, which leads to coronary artery thrombosis. These condition precipitate myocardial infarction. Tissue factor is a substance which is located inside of the plaque. This substance when exposed to bloodstream, activates the clotting cascade, leads to thrombosis. Tissue factor isexposed, when 'plaque rupture occurs. Plaque rupture and plaque erosion (ulceration) can resultin coronary thrombosis. STEMI or NSTEMI has a higher incidence of coronary thrombosis.Plaque rupture (most common) or erosion resulting in coronary occlusion is the important mechanism in

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NSTEMI and STEMI.The rupture of an atherosclerotic plaque with thrombotic occlusion of an coronary artery andtransmural ischemia resulting in acute myocardial infarction. The infarct starts from thesubendocardial layers in the middle of the area at risk and expand into the subepicardiallayersand to the border zones of area at risk with continuing duration of coronary occlusion.In humans, 30 to 50% of the area of risk is still feasible and therefore salvageable by reperfusionafter 4-6 hours from the beginning of angina symptoms, as evaluated from magnetic resonanceimaging (MRI) and biomarker analysis of myocardial salvage. The reperfusion is necessary tosalvage ischemic myocardium from nearing infarction, reperfusion also result in additional injury which may bereversible or irreversible andmanifest increased antarct size and micro vasculardysfunction.Irreversible injuryschematic diagram of mechanisms in the cardiomyocyte and coronary vascular compartmentwhich interact and contribute to irreversible ischemia/reperfusion injury.explains a schematic diagram of mechanism contributing to myocardial infarction andreperfusion injury to the cardiomyocyte and coronary vascular compartment. The infractedmyocardium is distinguished by swollen mitochondria, rupture in sarcolemma, hemorrhage,micro vascular destruction. These signs indicate necrosis which typically becomes more obviousand it is accelerated during repertusion.However, tissue necrosis is considered to be an unconditional mode of cell death and theirquantitative contribution to the infarct size is not clear. The sarcolemmal receptor and release of cytochrome c from damaged mitochondria initiates apoptosis, which is a energy dependent modeof cell death. Opening of the mitochondrial permeability transition pore (MPTP) is important fornecrosis and apoptosis. Ischemia or reperfusion injury in the coronary circulation recognized asmicro vascular dysfunction, which is creased by capillary permeability and edema and release ofplatelet, leucocytes and erythrocyte aggregates in the micro circulation from the atherosclerotiClesion and lastly capillary destruction and hemorrhage. Impairment of myocardial blood flowregardless of restoration of epicardial coronary patency was first reported by Krug et al., andKloner et al. They characterized the most severe form of myocardial ischemia of reperfusioninjury is no-reflow phenomenon. The delay to reperfusion increases the incidence of no reflow.The no-reflow and intramyocardialhemorrhage are the most important adverse prognostic factors

II. METHODOLOGY

This is a Retrospective cohort study which evaluates the prevention and effectiveness in patients with myocardial infarction along with diabetes mellitus who were presented to olive hospital for treatment. The study will be done after getting permission from the HR of the hospital to obtain the patient's data from the medical record department (MRD), all the eligible participants data will be collected in data collection form which includes demographic data such as name, age, gender, address, social habits, chief complaints, date of admission, IP number, personal history, family history, diagnosis, past medications, co morbidity conditions, lab reports and prescribed medications to recognize whether the patients with diabetes mellitus are at high risk of myocardial infarction. Also to evaluate the risk factors of myocardial infarction in patients with diabetes mellitus, therapeutic actions in patients with myocardial infarction and how to prevent myocardial infarction in diabetes mellitus patients.

STUDY DESIGN
The study is single center Retrospective cohort study.

STUDY SITE
Olive Hospitals, Nanal Nagar, Hyderabad, Telangana.

DURATION OF STUDY
Data will be collected from the medical record department (MRD) that fit the inclusion criteria for myocardial infarction patients with diabetes mellitus in a time period of 6 months.

STUDY POPULATION
SAMPLE SIZE- 200 Patients.

STUDY CRITERIA
INCLUSION CRITERIA
1. Men and women.
2. Patient's of age group above 30 years.
3. All patient's with pre existing co morbidity like diabetes mellitus.
4. All the patients are diagnosed with myocardial infarction.
5. Patient's residence in both urban and rural areas.

EXCLUSION CRITERIA
1. Pregnant or lactating women.

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2. Patient's having active pathological bleeding (peptic ulcer disease).
3. Patient's having history of intracranial hemorrhage.
4. Patients with severe hepatic impairment.

III. RESULTS

In our observational study, total 200 patients were assessed for 6 months in Olive Hospital, Nanalnagar. We included the patients who were diagnosed with Myocardial Infarction with diabetes mellitus and its prevention.

DESCRIPTIVE ANALYSIS

BASED ON GENDER

GENDER	NO OF PATIENTS	PERCENTAGE (%)
MALE	139	
FEMALE	61	

Table Distribution of patients based on gender

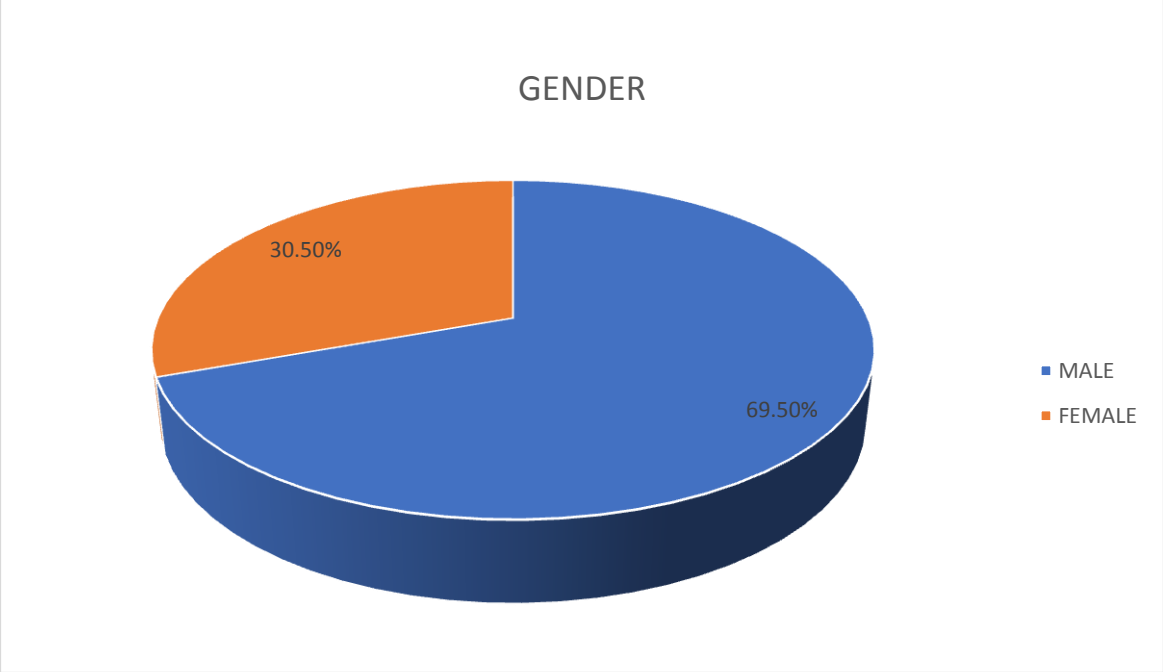

Figure distribution of patients based on gender

Out of 200 patients 69.5 patients were male and 30.5% patients were female.

BASED ON AGE

AGE	NO OF PATIENTS	PERCENTAGE(%)
31-45	36	18%
46-60	82	41%
61-75	66	33%
76-90	16	8%

Tabledistribution of patients based on age.

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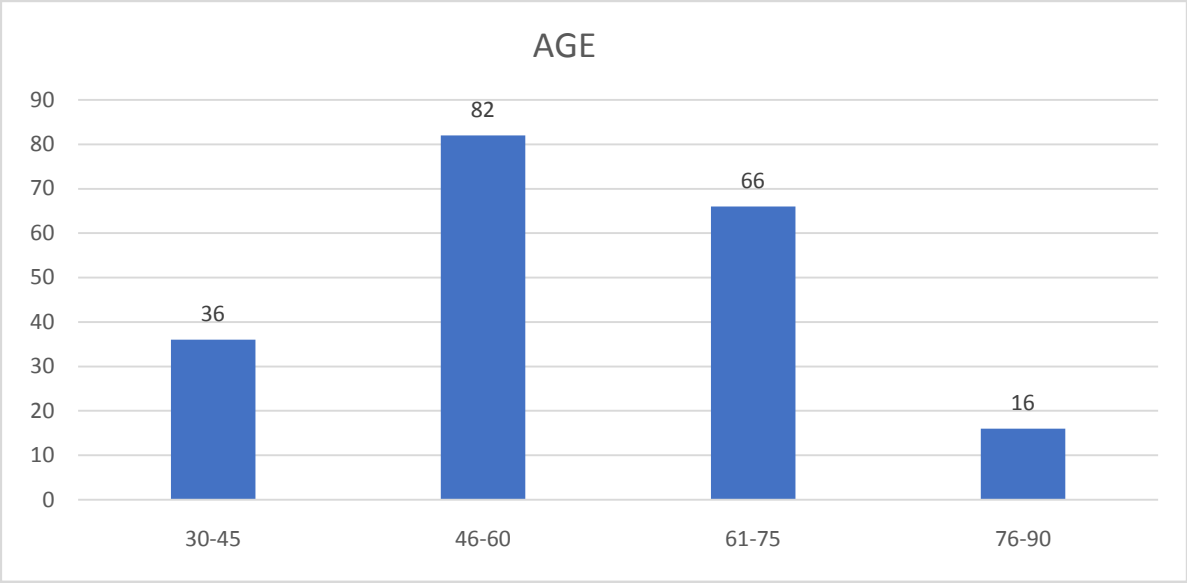

Fig distribution of patients based on on age.

Among 200 patients around 41% (82) patients between the age group of 46-60 years were having myocardial infarction with diabetes where as 33%, 18% and 8% patients between the age groups of 61-75, 30-45 and 76-90 years were having myocardial infarction with diabetes.

BASED ON ADDICTIONS

ADDICTION	NO OF PATIENTS	PERCENTAGES (%)
SMOKERS	15	7.5%
ALCOHOL	70	35%
OTHERS (TOBACCO CHEWERS)	25	12%
NONE	90	45%

Table distribution of patients based on addiction.

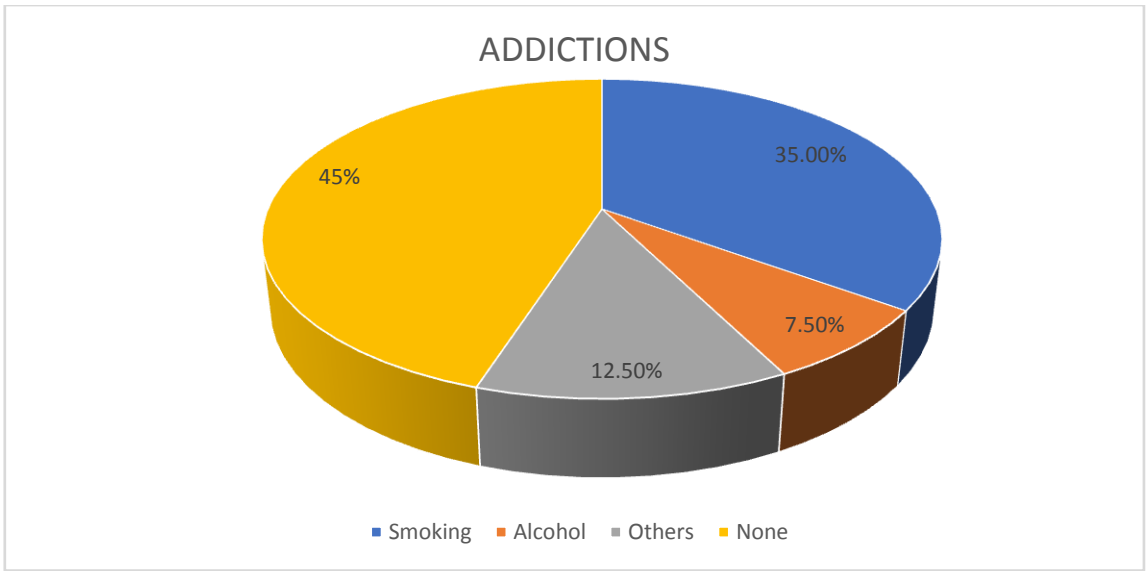

Fig distribution of patients based on Addiction.

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Out of 200 patients 35% of the patients were addicted to smoking , 7.5% patient were addicted to alcohol and 12.5% patient were addicted to Tobacco chewing and other where as 45% patients were had no addiction.

BASED ON DIAGNOSIS

DIAGNOSIS	NO OF PATIENTS	PERCENTAGE(%)
NSTEMI	49	24.5%
STEMI	5	2.5%
UA	17	8.5%

Table distribution of patients based on diagnosis

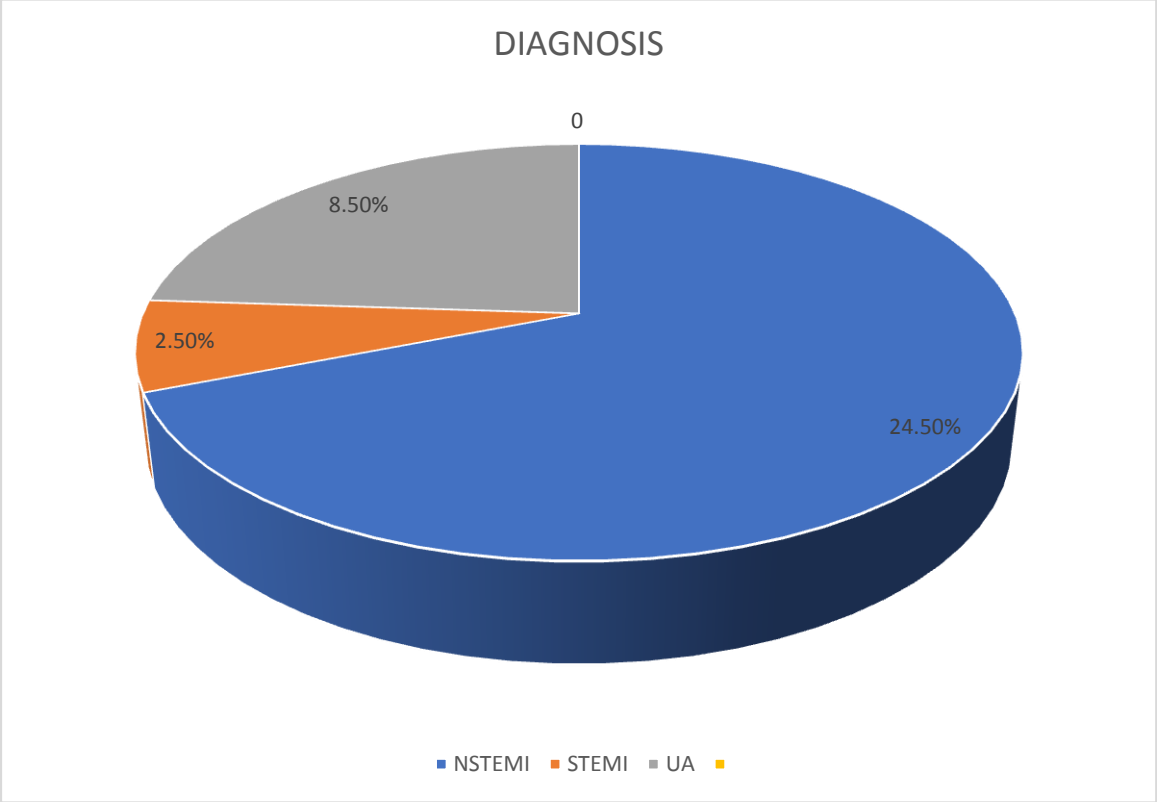

Fig distribution of patients based on diagnosis

Out of 200 patient who were having myocardial infarction with diabetes mellitus 24.5% (49) were diagnosed with Non ST elevated myocardial infarction (NSTEMI), 2.5% (5) were diagnosed with ST elevated myocardial infarction , 8.5%(17) were diagnosed with Unstable Angina(UA).

AVERAGE NO OF DRUGS PER PATIENT

NO OF DRUGS	NO OF PATIENTS	PERCENTAGE(%)
0-5	70	35%
6-10	118	59%
11-15	8	4%
16-20	4	2%
	Mean	St Deviation
Average no of drugs per patient		

Table Average no of drugs per patient.

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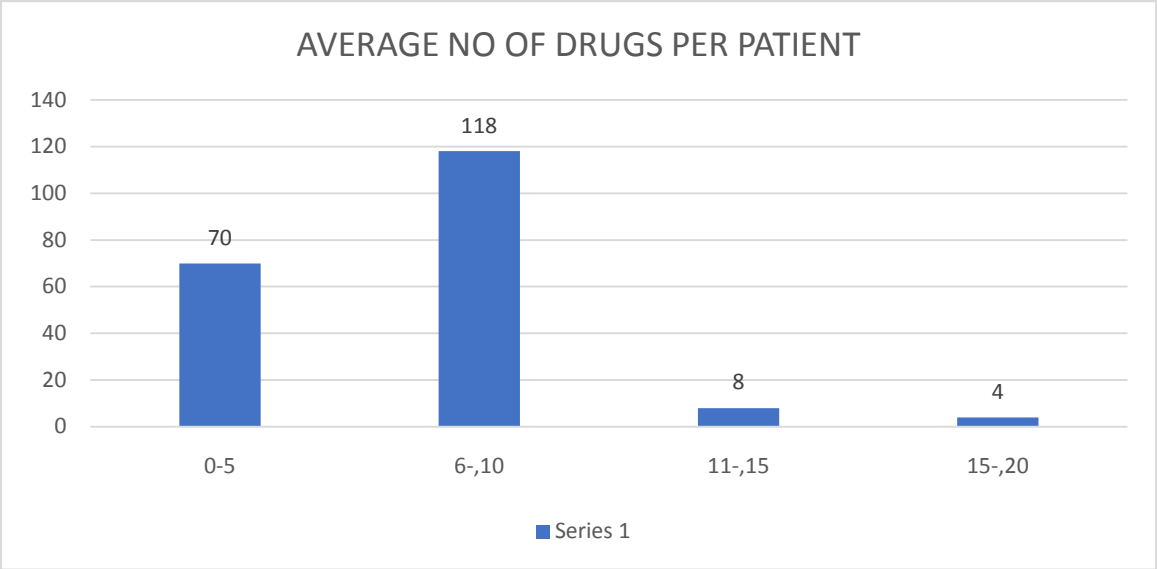

Fig Average no of drugs per patient

BASED ON CO- MORBIDITIES

CO-MORBIDITIES	NO OF PATIENTS
HTN	129
DM	46
THYROID	10
LIVER DISEASE	5
RENAL DISEASE	13
COPD	10
OTHERS	10

Table distribution of patients based on Co- morbidities

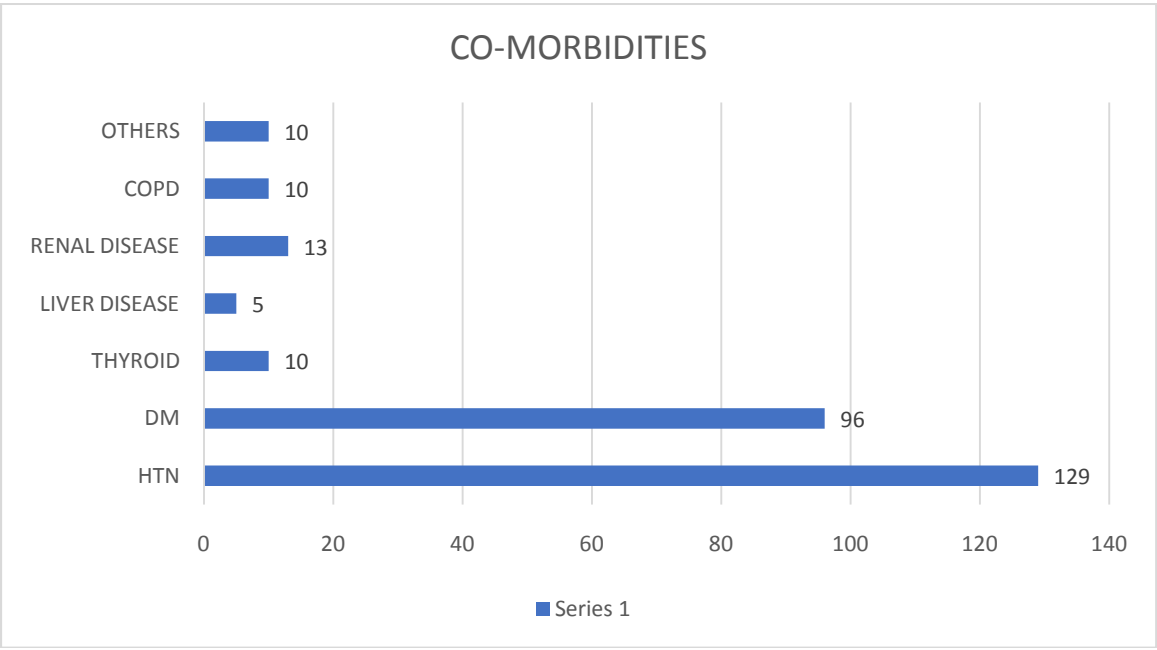

Fig distribution of patients based on co-morbidities

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Out of 200 patients majority of patients with myocardial infarction had co-morbidities of Hypertension and Diabetes melitus.

BASED ON NO OF DISEASED VESSELS INVOLVED

NO OF VESSELS	NO OF PATIENTS	PERCENTAGE(%)
SVD	14	7%
DVD	17	8.5%
TVD	27	13%

Table distribution of patients based on no of vessels involved

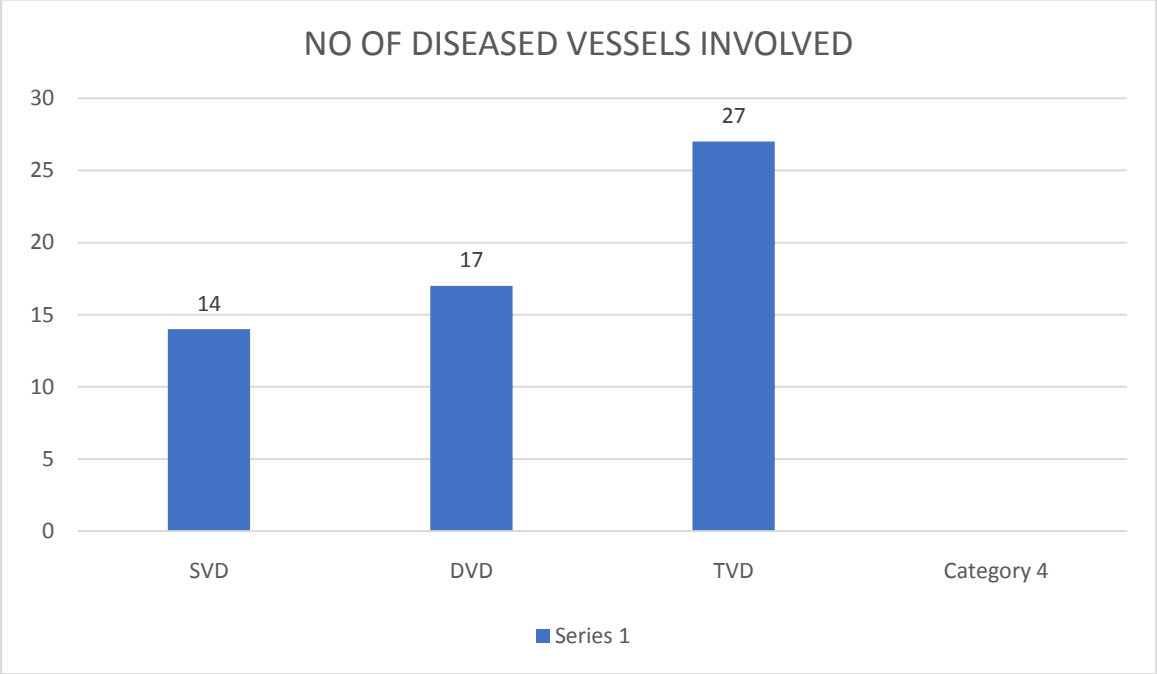

Fig distribution of patients based on no of vessels involve

Out of 200 patients who were on myocardial infarction with diabetes mellitus , 7% (14) were diagnosed with single vessel disease (SVD), 8.5%(17) were diagnosed with double vessels disease(DVD) and 13.5%(27) were diagnosed with triple vessel disease(TVD).

IV. DISCUSSION

We have conducted the study to asses the risk factor of myocardial infarction in diabetes mellitus patients and how to prevent it. In the prospective observational study, total no of 200 patients were considered based on the inclusion and exclusion criteria. The patients were having heart conditions along with co-morbidities like diabetes mellitus and Hypertension but most of the cases were myocardial infarction . The patients with age group of 46-60 years had maximum no of cases of myocardial infarction . Total 82 patients were in the age group of 46-60 years In which 53 were male patients and 29 were female patients. We have seen in study that male patients were more in number as compare to the female patients. We have also seen the patients of age group 30-45 years (36 patients), 61 -75 years (66 patients) , 76-90 years (16 patients) Apart from hypertension and diabetes mellitus the patient also had co-morbidities such as hypothyroidism, renal disease , liver disease and others . Depending upon diagnosis patients in the study they are divided NSTEMI , STEMI and UNSTABLE ANGINA. Where it has been done and shown the among 200 patients 49 patients were diagnosed with NSTEMI, 5 patients were diagnosed with STEMI and 17 patients were diagnosed with UNSTABLE ANGINA. NSTEMI are more common than STEMI. DISCUSSION AN OBSERAVATIONAL STUDY ON HIGH RISK OF MYOCARDIAL INFARTION IN DIABETES MELLITUS PATIENTS & ITS PREVENTION 31 The patients are further divided into no of vessels

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involved because patients have either single , double , triple vessels disease. In study 200 patients, we have seen 14 patients with single vessel disease , 17 patients were seen double vessels disease and 27 patients were seen triple vessels disease. Myocardial infarction can be prevented by small dosing of Aspirin (75-100mg) to the patient who is having major diabetes mellitus. Slow and small dosing of Aspirin prevents blood clotting and its prevent ACS(acute coronary syndrome) which in further could cause myocardial infarction. According to the study we have seen addiction in 200 patients , in which 70 patients of smoking addiction were seen , 15 patients were addicted to alcohol , 25 patients were addicted to tobacco , 10 patients were addicted to other types and remaining 80 patients were not addicted to anything . In the study we have seen that smoker have higher risk of developing myocardial infarction if they are also having co-morbidities like diabetes mellitus and hypertension. In the study we have seen that number of prescribe drugs in 200 patients were 6-10 type of drugs for 118 patients and highest number of drugs 16-20 types were given to 4 patients.

V. CONCLUSION

We conducted an observational study on myocardial infarction with diabetes mellitus patients for a period of 6 months . we conducted our study by taking sample size of 200 patients out of which 69.5% were male and 30.5% were female .according to the age wise distribution , patients in the range of 46-60 years were more in number suffering with myocardial infarction many patients also have co-morbid conditions like hypertension , diabetes mellitus hypothyroidism and others .

The patients are diagnosed as NSTEMI , STEMI and UA. Based on ECG TMT troponin1. More patients were diagnosed with NSTEMI many patients were having TVD . These patients were treated with aspirin and antiplatelets drugs before and after PTCA were performed .

Hence , further studies are required on larger sample size so that the people can be aware that those who are having diabetes mellitus have higher risk of developing myocardial infarction . But it can be prevented by some simple measures as we discussed .

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