

**PREVALENCE OF DEPRESSION AMONG POST MYOCARDIAL
INFARCTION PATIENTS ATTENDING CARDIOLOGY
OUTPATIENT DEPARTMENT**

Submitted

BY

Dr. NAVEEN KUMAR.S MBBS

Dissertation submitted to

THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY, CHENNAI,

In partial fulfillment of the requirements for the degree of

DOCTOR OF MEDICINE IN PSYCHIATRY

Under the guidance of

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Professor

DEPARTMENT OF PSYCHIATRY



PSG INSTITUTE OF MEDICAL SCIENCES AND RESEARCH

COIMBATORE

DECLARATION BY THE CANDIDATE

I hereby declare that this dissertation entitled “**Prevalence of depression among post myocardial infarction patients attending cardiology outpatient department**” is a bonafide and genuine research work carried by me under the guidance of Dr.I.Anand, Professor, Department of Psychiatry, PSG IMS&R, Coimbatore.

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At the outset, I thank God for giving me the strength to perform all my duties.

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ABSTRACT:

BACKGROUND:

Depression is more commonly seen following a myocardial infarction event and it is an important prognostic factor. It is associated with the increased risk of recurrent cardiovascular events or death and finally it is associated with the increased risk of suicide which remained high and persistent for more years. Quality of life, good treatment adherence is also affected in patients with depression in a myocardial infarction individuals. Literature predominantly includes studies addressing only the prevalence of depression in myocardial infarction patients and only few studies are done in Indian population and the data available is very scarce. Hence identifying and comparing the severity of depression in myocardial infarction patients based on their treatment received for their myocardial infarction and by addressing these early would improve treatment outcome for both psychiatric and cardiovascular events and overall wellbeing.

AIM OF THE STUDY:

- 1) To estimate the prevalence of depression among post myocardial infarction patients.

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July 21, 2014

To
Dr S Naveen Kumar
Postgraduate
Department of Psychiatry
PSG IMS&R
Coimbatore

Ref.: Proposal titled: *"Prevalence of depression among post myocardial infarction patients attending Cardiology outpatient department"*

Sub.: Ethics Committee Approval for the study

The Institutional Human Ethics Committee, PSG IMS & R, Coimbatore -4, has reviewed your proposal on 24th June, 2014 in its full board review meeting held at Research Conference Hall, PSG IMS&R, between 2.00 pm and 4.45 pm, and discussed your application to conduct the study entitled:

"Prevalence of depression among post myocardial infarction patients attending Cardiology outpatient department"

The following documents were received for review:

1. Duly filled application form
2. Proposal
3. Informed Consent forms (Ver 1.1)
4. Data Collection Tool (Ver 1.1)
5. Permission letter from concerned Head of Department
6. CV
7. Budget

The members who attended the meeting at which your study proposal was discussed are as follows:

Sl. No.	Name of the Member of IHEC	Qualification	Area of Expertise	Gender	Affiliation to the Institution Yes/No	Present at the meeting Yes/No
1	Dr. S. Bhuvaneshwari (Member-Secretary, IHEC)	MD	Clinical Pharmacology	Female	Yes	Yes
2	Mrs. Geetha S Kannan	+ 2	Lay person	Female	No	Yes
3	Mr Gowpathy Velappan	BA., BL	Legal Advisor	Male	No	Yes
4	Mrs G Malarvizhi	M Sc	Nursing	Female	Yes	Yes
5	Mr. R. Nandakumar (Vice-Chairperson, IHEC)	BA., BL	Legal Expert	Male	No	Yes
6	Dr. G. Rajendiran	DM	Clinician (Cardiology)	Male	Yes	No
7	Dr. V. Ramamurthy	Ph D	Biotechnology	Male	Yes	No



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8	Dr. M. Ramanathan	M Pharm, Ph D	Non-Medical (Pharmacy)	Male	Yes	Yes
9	Dr. P. Sathyan (Chairperson, IHEC)	DO, DNB	Clinician (Ophthalmology)	Male	No	Yes
10	Dr. Seetha Panicker	MD	Clinician (Obstetrics & Gynaecology)	Female	Yes	Yes
11	Dr. S. Shanthakumari	MD	Pathology, Ethicist	Female	Yes	Yes
12	Dr. Y.S. Sivan	Ph D	Social Scientist (Sociology)	Male	Yes	Yes
13	Dr. Sudha Ramalingam (Alternate Member-Secretary, IHEC)	MD	Public Health, Epidemiology, Genetics, Ethicist	Female	Yes	Yes
14	Mrs. K. Uma Maheswari	M Sc, M Phil. B Ed	Botany	Female	No	No
15	Dr. D. Vijaya	M Sc, Ph D	Basic Medical Sciences (Biochemistry)	Female	Yes	Yes

After due consideration, the committee has decided to approve the above proposal.

The approval is valid for one year.

We request you to intimate the date of initiation of the study to IHEC, PSG IMS&R and also, after completion of the project, please submit completion report to IHEC.

We hereby confirm that neither you nor any of your study team members have participated in the voting/ decision making procedure of the committee. The members of the committee who have participated in the voting/ decision making procedure of the committee do not have any conflict of interest in the referenced study.

This Ethics Committee is organized and operates according to Good Clinical Practice and Schedule Y requirements.

Non-adherence to the Standard Operating Procedures (SOP) of the Institutional Human Ethics Committee (IHEC) and national and international ethical guidelines shall result in withdrawal of approval (suspension or termination of the study). SOP will be revised from time to time and revisions are applicable prospectively to ongoing studies approved prior to such revisions.

PIs are required to send progress reports (in the form of an extended abstract with publications if any) to the IHEC every six months (and a month before expiry of approval date, if renewal of approval is being sought).

Request for renewal must be made at least a month ahead of the expiry of validity along with a copy of the progress report.



Dr S Bhuvaneshwari
Member - Secretary
Institutional Human Ethics Committee



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ABSTRACT:

BACKGROUND:

Depression is more commonly seen following a myocardial infarction event and it is an important prognostic factor. It is associated with the increased risk of recurrent cardiovascular events or death and finally it is associated with the increased risk of suicide which remained high and persistent for more years. Quality of life, good treatment adherence is also affected in patients with depression in a myocardial infarction individuals. Literature predominantly includes studies addressing only the prevalence of depression in myocardial infarction patients and only few studies are done in Indian population and the data available is very scarce. Hence identifying and comparing the severity of depression in myocardial infarction patients based on their treatment received for their myocardial infarction and by addressing these early would improve treatment outcome for both psychiatric and cardiovascular events and overall wellbeing.

AIM OF THE STUDY:

- 1) To estimate the prevalence of depression among post myocardial infarction patients.
- 2) To do a comparative analysis of prevalence of depression among patients who had received medical management, angioplasty and surgical management.

METHODS:

Cross sectional study involving consecutive patients with the diagnosis of myocardial infarction during their follow up from one month to within one year and other selection criteria were included after written informed consent. The overall sample consists of 183 patients. They were divided into three groups based on the treatment received such as angioplasty, medical management and surgical management group. Hamilton depression rating scale, a 24 item version scale which is administered to all the subjects. Socio demographic details and risk factors contributing to the illness were also included.

RESULTS:

Depression was observed in the post myocardial infarction patients included in the study. Among 183 patients, total number of depressed patients were 88 which was around 48% of study population. Mild depression is seen high in the post myocardial infarction patients than moderate and severe depression in all the three study groups. When comparing the prevalence of depression in the three study groups, the prevalence of depression is high in medical management group but this was not statistically significant. Based on the severity of depression, mild and moderate depression is high in the medical management group of patients. The comparative analysis of co-variables showed that diabetes mellitus has significant correlation with the depression in angioplasty group.

CONCLUSION:

Addressing depression after the myocardial infarction is important. Screening and identifying the depression during early stages results in educating life style modification, improving drug compliance and thereby improving the treatment outcome and preventing progression of depression from milder to severe ones.

INTRODUCTION

Depression as a number of adverse health consequences which also includes impairment of physical function, increased morbidity and increased risk of death². It has been found that cardiac illnesses play a major role in the development of these consequences. Depression is a potential risk factor for cardiac complications leading to death. Depression increases the risk of cardiac mortality in people with and without cardiac illness at the baseline.

DEPRESSION:

Depression is one of the common mood disorders. It is a disorder of major public health importance and common in women than men. This is the second leading cause of disability-adjusted life years next to ischemic heart disease in the world⁶.

The lifetime prevalence rate of major depression is around 5 – 17 %.

Mood: It is defined as the pervasive and sustained emotion or the feeling tone which influences one's behaviour and colours the perception of being in the world¹.

A depressed "affect" occurs usually in response to a particular situation and is defined as a transient and non-substantive state of feeling 'depressed', 'sad', or 'blue'¹.

A depressive condition or episode is generally distinguished from depressed affect by having a longer duration, more clinical features and significant social impairment.

The adjectives that are used to describe mood in depression are sad, depressed, distressed, irritable¹.

ICD -10 Classification of Mental and Behavioral disorders classifies the depressive episode into the following categories which comes under F32³.

1. Mild depressive episode
 - a. Without somatic syndrome
 - b. With somatic syndrome
2. Moderate depressive episode
 - a. Without somatic syndrome
 - b. With somatic syndrome
3. Severe depressive episode
 - a. Without psychotic symptoms
 - b. With psychotic symptoms
4. Other depressive episodes
5. Depressive episode, unspecified.

Depressed mood, loss of interest and enjoyment and increased fatiguability are usually regarded as the most typical symptoms of depression.

Duration required for the diagnosis is at least 2 weeks for depressive episodes of all the three grades of severity.

There are major criteria and minor criteria:

Major criteria includes the following symptoms:

1. Depressed mood.
2. Loss of interest and enjoyment.
3. Reduced energy leading to fatigability.
4. Marked tiredness after only slight effort.

Minor criteria includes the following symptoms:

- A. Reduced concentration and attention
- B. Reduced self-esteem and self confidence
- C. Ideas of guilt and unworthiness
- D. Bleak and pessimistic view of future
- E. ideas or acts of self-harm or suicide
- F. Disturbed sleep
- G. Diminished appetite.

The depressed mood may vary a little from day to day and is most often unresponsive to different circumstances. There may be diurnal variation as the day goes on which is a characteristic feature in depression.

The depressive symptoms varies markedly in each individual. In adolescence atypical presentation of depression is particularly common.

Some patients with depression presents with symptoms of anxiety, distress and motor agitation which are more prominent at times than the depression itself. In these patients depressed mood is masked by irritability, histrionic behaviour, excessive alcohol use, exacerbation of previously existing obsessional and phobic symptoms or by hypochondriacal preoccupations.

Some of the symptoms mentioned above may be marked and leads to development of characteristic features which are regarded as having important clinical significance. These are called somatic symptoms³.

Somatic symptoms seen in depression include the following:

1. The loss of interest or pleasure in activities that are normally enjoyable
2. The lack of emotional reactivity to normally pleasurable surroundings
3. Waking 2 hours or more before usual time in the morning
4. Depression worse in the morning hours
5. Objective signs of psychomotor retardation or the agitation
6. Loss of appetite
7. Weight loss of 5 % in the past one month
8. Loss of libido which is marked

Somatic syndrome should comprise at least 4 of the above mentioned symptoms³.

Psychotic symptoms occurs in severe stage of depressive illness which includes delusions and hallucinations. The delusions characteristic for depressive episode include delusion of nihilism, delusion of guilt, Cotard syndrome¹. The delusions can also be persecutory and referential in nature.

Auditory hallucination is the most common modality seen in depressed patients. The voices can be commanding in nature. At times the patients may act out according to the hallucinations which can lead to suicide or homicide.

Suicidal thoughts and attempts are more common in depressed patients and assessment of suicidal risk is a major task for any psychiatrist and physician.

Suicide is among the top three causes of death in youth population and depression is one of the common cause for suicide. Suicide worldwide was estimated to represent around 2.4% of the total global burden of disease in 2020⁵. Recently, WHO data rated the range of suicide from 0.7/100,000 in the Maldives to 63.3/100,000 in Belarus.

India ranks around 43rd in the descending order of rates of suicide and the rate is 10.6/100,000 as reported in 2009.

Young adults are a vulnerable group than elderly people and currently show the highest rates of suicide worldwide. Developed countries show a second peak of increased rate of suicide in the elderly age group, (i.e) above 60 years⁴. There is a global trend towards increased suicide rate in late life, especially in men. In India there is low prevalence of suicide among elderly which may be because their life expectancy in late life is lower in India. The ratio of completed suicide to attempted suicide is about 1:7. This may reflect the poorer ability of the elderly to recover from the suicidal attempt which has caused bodily insult⁵. It also correlates with the presence of physical illness in the elderly such as cardiovascular diseases.

Attempted suicide is commoner in women and completed suicide is common in men. Men use more lethal modes than women for suicidal attempt.

Divorced, separated, widowed and single people are more likely to commit suicide than married people who are said to be protected by the effect of marriage and family integration⁵.

Among psychiatric disorders depression and alcohol use disorders are a major risk factor for suicide. In India studies show varying results with rates of mental illnesses ranging from 9.5 to 24.9 %. Suicidal attempt has been found to be positively correlated with the severity of depression. Underlying dysthymic disorder is common in suicidal behaviour⁵.

About one-fifth of the suicide attempters were found to be having a physical illness. Hypertension is correlated to have a positive effect in suicidal attempt.

Predicting suicide is one of the most important task for any psychiatrist and also physician. Hopelessness is a feature seen in depression which has been found to an important correlating factor for suicide. Hopelessness scale can correctly identify 91% of suicides. Hamilton Depression Rating Scale used in our study also focuses on eliciting the symptom of hopelessness thereby helping us to predict any suicidal ideas⁵.

Suicide is an important and largely preventable public health problem. Hence early detection and adequate treatment of the primary psychiatric disorder is of paramount importance in the current situation.

The depressive episodes which occur for second time or more should be classified as recurrent depressive disorder. Recurrent depressive disorder also has similar subdivisions. In our study recurrent depressive disorder patients are excluded.

MYOCARDIAL INFARCTION

Myocardial infarction is an ischaemic heart disease. It is the major cause of death and disability in the world⁷.

The incidence of myocardial infarction is 5/1000 per year. 50% of deaths due to myocardial infarction occur in the first 1 – 2 hours following the onset of symptoms.

The term acute myocardial infarction is used when there is evidence of myocardial necrosis in the clinical setting and it is consistent with the acute myocardial ischaemia. Onset of myocardial ischemia is the initial presentation of the myocardial infarction.

Myocardial infarction can be seen by the clinical features, ECG findings, biomarkers of myocardial necrosis, imaging and by the pathology findings.

Clinical features of myocardial infarction include the following signs and symptoms:

Symptoms include chest pain associated with sweating, nausea, vomiting and the patient is in extreme distress. Diabetics and elderly patients can experience painless infarcts which is due to autonomic neuropathy.

Signs of myocardial infarction include the following:

- Tachycardia, bradycardia, gallop
- Hypertension or hypotension
- Cyanosis

- Cold clammy extremities
- Features of complications such as left ventricular failure, arrhythmias and pulmonary oedema.

ECG findings:

- Initially ECG may be normal and hence serial ECGs should be taken.
- ST elevation, T wave inversion along with pathological Q waves are seen in leads which are adjacent to the infarcted segment.
- In the opposite leads there is reciprocal ST depression or T wave inversion.
- A non Q wave infarct can occur which has high risk of mortality.

Biomarkers of myocardial necrosis:

The following are the biomarkers which are abnormally raised in myocardial infarction:

- CPK-MB
- AST
- LDH
- Troponin T

Management of myocardial infarction involves

Medical management by thrombolysis with fibrinolytic therapy initiated within 30 minutes of the presentation.

Primarypercutaneous intervention like angioplasty.

Surgical management by coronary bypass graft surgery.

Commonly used drugs for the treatment of myocardial infarction include:

- Nitrates
- Beta blockers
- ACE inhibitors
- Morphine sulphate
- Warfarin
- Calcium channel blockers

REVIEW OF LITERATURE

Recent studies show that depression and cardiovascular disease has bidirectional relationship. The prevalence rate of Cardio Vascular diseases like myocardial infarction, and psychiatric illnesses like depression are independently high.

The incidence rate of myocardial infarction is 64 per 1000 population in India¹⁵. It causes the significant decrease in the quality of life of the patient and becomes an economic burden to the patient.

Depression is a common comorbidity in myocardial infarction. When compared between depressed individuals and non-depressed, the depressed individuals were more likely to develop the recurrences and doubles the risk of coronary artery disease.

In a large prospective community-based study, it was noted that patients with a history of depression had relative risk of 4.5 for having an acute myocardial infarction when compared with non-depressed subjects. This is assessed independent of other cardiovascular risk factors contributing for the myocardial infarction.

The prevalence of depression ranges from 16 to 45 %. In the ENRICHD study they examined around 9279 patients and said about 20% of the prevalence rate of depression following cardiovascular disease¹⁶.

20% of the patients had depression who were hospitalized with acute coronary syndromes either found out at the admission or immediately after follow-up period recovery from coronary heart disease.

Cross-sectional studies have reported depressive and anxiety symptoms between 19 and 66% of the patients with myocardial infarction and 17–44% had major depression¹⁷. Major depression was common among unstable angina and coronary bypass graft surgery patients.

The prevalence rate of depression in myocardial Infarction individuals is higher than in general population. The prevalence of depression is higher following myocardial infarction.

In one study of stable coronary heart disease patients, prevalence rate of depression was approximately around 18% in a well proved angiographically confirmed coronary heart disease.

Depression following coronary artery bypass graft has the negative impact on the survival rates¹⁸.

Presence of depression at baseline prior to Coronary artery bypass graft was an independent predictor of cardiovascular mortality after a post-coronary artery bypass graft which was reported in two studies¹⁹.

Studies reported that dose–response relationship between depression and death was reported to the adverse cardiac events and the baseline increased depression scores has the risk of cardiac mortality.

In the Indian Population, research done on this area is very sparse. Agarwal et al reported depression in individuals after acute myocardial infarction was 23.7% of patients following 4 to 6 weeks of acute myocardial infarction¹⁵. 20.7% patients were noted to have Sub-syndromal depression.

Depression following myocardial infarction (MI) is becoming more common, persistent and it increases the risk independently for an early cardiac morbidity and mortality and finally lead on to death. It predicts morbidity and mortality in patients with coronary artery disease. It causes poor prognosis¹⁷.

Depression remains unrecognised and underdiagnosed condition. Depression developed after myocardial infarction patients are slower and are less likely to return to their work. It increases the emotional distress. Hence early identification of depression in myocardial infarction patients is important to predict the work outcomes.

Depression is likely to impair health related quality of life of the patient and it increases the risk of suicide. Quality of life of patients with coronary artery disease can be improved by treating the depression as early as possible.

Studies reporting that somatic symptoms of depression has increased risk than the cognitive part of depressive symptoms.

Women has a greater affinity for protection against fat accumulation in the coronary region than men. After myocardial infarction mortality rate was higher in women than men and it results in poor prognosis.

Depression requires screening because of the significant morbidity. Screening can be done in low cost and there is no risk related to it.

Lichtman JH et al states that, 2008 AHA Science Advisory concluded that screening tests for depressive symptoms should be done for post MI patients. Screening can identify patients who require further assessment and treatment to improve outcomes²².

There is an association between the depression and the cardiovascular disease but the mechanism is still unclear. Studies have reported several biological mechanisms.

There are four areas which explain the mechanisms are

1. Autonomic nervous system dys-regulation
2. Blood clotting and endothelial dysfunctions
3. Inflammation
4. Neuroendocrine abnormalities

Autonomic nervous system dysfunction:

The autonomic imbalance is seen between depression and coronary heart disease. Changes in the autonomic tone is seen in depression and ischaemic heart disease. Increased parasympathetic tone and increased sympathetic tone is seen in the autonomic imbalance. Increased sympathetic tone will reduce the threshold for ventricular tachycardia, finally causing death²⁶.

Elevation of urinary and plasma noradrenaline levels are seen in both depression and heart disease.

The elevation of resting heart rate is seen in increased sympathetic tone of depressed and coronary artery disease patients. Heart rate variability is seen in autonomic nervous system dysfunction. Heart rate variability means beat to beat changes in heart rate as the heart responds to external and internal stimuli²⁹.

Low heart rate variability indicates the excessive sympathetic activity. In a recent study of myocardial infarction individuals, the correlation between the depression related mortality and the low heart rate variability was 30%²³.

Increased basal heart rate is a predictive of mortality and morbidity of cardiovascular disease. Both heart rate variability and turbulence found in the mortality of depression patients.

The baro-reflex reduction sensitivity was associated with depression and coronary artery disease²⁵.

QT variability is seen in post myocardial infarction and depressed patients along with sudden cardiac death is seen.

Blood clotting and endothelial dysfunction:

Relationship between depression and the cardiovascular disease is the imbalance between thrombotic, pro-thrombotic and endothelial dysfunction.

Depression is associated with the increased platelet activation causing increased serotonin induced calcium mobilisation.

The levels of platelet factor-4, beta-thromboglobulin, platelet reactivity to serotonin was increased. Decreased platelet reactivity to adenosine diphosphate has been seen in both depression and coronary artery disease individuals.

In the brachial artery ultrasound there is a reduced endothelium dependent flow mediated vasodilation seen in depressive patients²⁵.

The marker of endothelial activation is the circulating levels of intercellular adhesions soluble seen in depressed and recent myocardial infarction patients and which is not seen in the non- depressed patients. Nitric oxide production was decreased causing increased reactivity of platelet and endothelial dysfunction.

Production of decreased nitric oxide is seen in the increased platelet reactivity and vasodilation dependent of the reduced endothelium in the depressed individuals. It also inhibit adhesion and aggregation of the platelets.

Platelet endothelial iso- form and metabolites of nitric oxide is decreased in depression.

Inflammation

Atherosclerosis causes rupture and thrombosis in coronary artery disease. Now it is considered as an inflammatory disease and there is a connection between depression and coronary artery disease²⁷.

The acute phase inflammatory proteins like IL 6, TNF alpha, IL beta 1 is increased in depression. When administration of TNF alpha and alpha interferon were introduced exogenously the depressive symptoms were seen²⁴.

The circulating levels of C reactive protein and IL 6 is a strong predictor of ischaemic events along with smaller contributing factor of inflammatory process. Increased levels of intercellular adhesion molecule-1, eselectin and monocyte chemoattractant protein-1 are present in depressed individuals causing atherosclerosis formation.

In a meta-analysis, CRP was found to be predicting recurrent myocardial infarction and death due to cardiac disease.

Depression has an association between decreased levels of omega 3 polyunsaturated fatty acids and homocysteine levels.

Coronary heart disease patients and depression have lower concentration of omega 6 and imbalance of omega 3 polyunsaturated fatty acids than myocardial infarction patients without depression.

Neuroendocrine abnormalities:

The pro inflammatory cytokines causing to stimulate Hypothalamic pituitary adrenal axis leading onto a cycle of atherosclerotic process and finally to ischaemia.

Psychological mechanism linking depression and the cardiovascular disease:

1. Sleepdisturbance
2. Physical inactivity
3. Smoking
4. Poor personal hygiene
5. Poor treatment adherence

Sleep disturbance

It is one of the depressive symptoms and it is seen as a common problem in both the conditions.

Reduction in sleep causes autonomic hyperactivity and results in worsening of cardiovascular risk factors. It also seen in conditions linked with diabetes, obesity and other risk factors. Increased risk of hypertension is seen in the short sleep duration.

Leptin, ghrelin levels seen in regulation of appetite is seen in the chronic sleep deprivation patients.

Karina W. Davidson et al. stated that anhedonia identifies and predicts the risk of major adverse cardiac events along with all-cause mortality²⁸.

Physical inactivity:

Increased physical inactivity is seen in both depression and cardiovascular disease and they are interlinked. Depressed patients are less likely to participate in the cardiac rehabilitation program such as adopting an exercise program which helps in decreasing the risk factor for the development of new episodes of cardiac event.

Regular physical activity shows decreased mortality from cardiac disease and also improvement in the cholesterol levels, blood sugar levels and hypertension. Depression will be increased in the physical inactivity.

Smoking:

Depressed patients are more likely to smoke than in the general population. They are less likely to quit and it precipitates depression.

In one study, depressive symptoms following cardiac disease has a relation to relapse smoking after discharge from the hospital and decrease in the rate of smoking stoppage after long term follow up.

Depressed individuals are likely to smoke because of the mood elevating effects of tobacco and experience reward from the smoking due to dysfunctional dopaminergic reward centre in the brain. Also, the activation of the reward system by d-amphetamine in turn releases dopamine in the brain.

Bupropion has added benefits of causing reduction in weight and smoking cessation and it is better than SSRI's

Poor hygiene:

Poor self-hygiene is seen in depressive individuals and can lead to periodontal disease which results in chronic inflammation and increased pro-inflammatory cytokines.

Depressed individuals will not give importance to the self-care and there will be a deterioration in their personal hygiene. Gingivitis is also seen in the chronic inflammation because of the reduced salivary flow along with the dental carries. Fibrinogen can also be increased due to periodontitis.

Poor treatment adherence:

Depression patients are associated with unhealthy lifestyle and are more likely to smoke and consume alcohol and they will be obese or overweight. There is non-compliance to medical treatment.

DiMatteo et al reported that depression was linked to non-adherence to treatment recommendations prescribed²¹.

Studies reported that non-compliant patients are almost three-times more likely to die in the first year of follow-up post-MI compared with those compliant patients.

Non-adherence includes the improper use of the cardiac drugs, not on proper diet, improper and irregular follow up to the doctor resulting in the risk of recurrences of cardiovascular disease.

Depressive patients have negative attitudes towards the cardiac treatment and the cost of the medication and fear of side effects and they have poor adherence and has increased mortality.

Social isolation:

Depression patients are socially isolated or withdrawn. Studies has shown that depression with heart disease has less social support and it is related to the mortality of the individuals.

Individuals who are staying alone has increased risk of death and mortality which is more common in men.

Low levels of social support and social isolation is seen in the depression and high levels of social support would help the individuals from the negative effects of depression.

Self-efficacy:

Low self-efficacy is seen in depression and cardiovascular disease and negatively affects the health of the patient.

Self-efficacy enhancing interventions has shown good results in the improvement of cardiac status of the patients. It can help to practise healthy life styles.

Treatment of depression following coronary artery disease:

The SADHART study examined the major depressive disorder patients on sertraline for safety and efficacy with a recent unstable angina and myocardial infarction patients.

Results showed a mild decrease in depressive symptoms in patients with sertraline than the placebo but they lacked statistical power for the clinical end points³⁰.

In another study, 284 patients of major depressive disorder and coronary heart disease patients compared citalopram versus interpersonal therapy and found no significant difference between management strategies. Citalopram was superior to placebo in reducing the depression scores in the Hamilton depression rating scale and showed the better remission rates.

Another study examined the impact of psychosocial intervention on outcomes in patients with depression and coronary heart disease and the results showed decrease in the depressive symptoms but there were no clear reporting on the survival of the patients.

In one recent randomized control trial, they introduced the concept of enhanced depressive care for patients with persistent depression in post-acute coronary syndrome for around 237 patients and the results showed significant reduction in depressive symptoms and mild improvement in their cardiac prognosis.

In ENRICHD study (2003) they studied 2481 patients of Myocardial infarction who underwent Cognitive Behaviour Therapy and Sertraline versus usual care. Results showed improvement in depression scores but no significant improvement in morbidity and mortality of myocardial infarction after 29 months of follow-up.

In the treatment resistant depression one or more of antidepressant drugs may be prescribed and is associated with a high risk of mortality and morbidity in patients with acute coronary syndromes with depression.

The ENRICHD study concluded that in treatment resistant depression by effective treatment of depression will reduce the mortality in the post myocardial infarction patients and it will improve the cardiac outcome.

Davidson et al suggested to improve effect by Behavioural activation intervention.

Expressing gratitude, kindness, regularly visualizing one's best possible self, forgiveness therapy may all be helpful for the patients' wellbeing and the improvement of depression.

Studies reporting that treatment with antidepressants (SSRI's & TCA's) in Coronary artery disease does not improve survival rate but the drugs improve the symptoms of depression and quality of life, but there was no evidence to say on the survival rate.

RATIONALE FOR THE STUDY

Studies have shown high prevalence of depression following myocardial infarction patients but these problems receive very less attention. They are often under explored and also ignored by the therapist and physician on few occasions during their follow ups. This might lead to problems with their compliance of cardiovascular drugs and following poor life style, worsening of medical comorbidities like hypertension and diabetes mellitus finally depression symptoms also got worsened and results in recurrent myocardial infarction and causes death.

Addressing the issue of depression following myocardial infarction is very important to improve the quality of life and good adherence to treatment.

Studies addressing depression following myocardial infarction in Indian population is sparse. Most of the studies have included only prevalence of depression following myocardial infarction. No study has compared depression among myocardial infarction patients according to their treatment received. Also, the prevalence of depression among post myocardial patients receiving various modalities of treatment for their myocardial infarction has not been studied.

The prevalence of depression among the myocardial infarction patients and the barriers caused by the depression in their treatment process needs to be further explored in our Indian population.

We considered doing an analysis of prevalence of depression following a myocardial infarction according to the treatment received such as medical management, angioplasty and surgical management. The prevalence of severity of depression such as mild, moderate and severe in these three groups of myocardial infarction is studied. Along with this other parameters such as socio demographic factors, hypertension, smoking, diabetes mellitus, coronary angiogram and dyslipidemia were also analysed.

AIM:

1. To estimate the prevalence of depression among post myocardial infarction patients.
2. To do a comparative analysis of prevalence of depression among patients who had received medical management, angioplasty and surgical management.

INCLUSION CRITERIA:

1. Patients who received the diagnosis of myocardial infarction by cardiologist.
2. Post myocardial infarction patients from one month to one year duration of their follow up.
3. Both sexes.
4. Patients who are willing to give written informed consent.

EXCLUSION CRITERIA:

1. Any known history of psychiatric illness except nicotine dependence syndrome.
2. Patients having psychiatric illness while on treatment prior to the onset of myocardial infarction.
3. Other medical comorbidities except diabetes mellitus, dyslipidemia and systemic hypertension are excluded.

METHODOLOGY

Study was conducted from July 2014 to July 2015.

The study proposal was presented and ethics clearance was obtained from the Institutional Human Ethics Committee.

Patients who had received a diagnosis of myocardial infarction, according to cardiologist during their follow up from one month to one year are selected for the study after obtaining written informed consent.

Patients are selected conveniently in the cardiology outpatient department and were explained about the nature of the study.

All recruited patients will be divided into three groups based on the treatment received for their myocardial infarction.

First group: patients who received medical management.

Second group: patients who underwent angioplasty.

Third group: patients who underwent surgical management.

All recruited patients were administered Hamilton Depression Rating Scale – 24 items by the principle investigator. Patient interview and observations were used to complete the rating. The time taken to complete the assessment was around 15 to 20 minutes.

The Hamilton depression rating scale HAM-D:

The Hamilton Depression Rating scale is one of the earliest scales that was developed for depression. It is a clinician rated scale. It is aimed at assessing the severity of depression among the patients.

The 24 item rating scale is used in our study .It is a well validated rating scale used in several studies for assessing depression and the severity of depression.

Application of the rating scale:

Administration method:

The HAM D rating scale is widely used in clinical practice and clinical trials. Generally it is administered once in a week. Our study being cross sectional study, we have administered once in patients with post myocardial infarction status during their follow up in the cardiology outpatient department.

Timing of administration:

The HAM D rating scale administration takes around 15 to 20 minutes. The time taken is considered adequate to assess the depressive symptoms. HAM D is used over the course of decades and is the most popular depression severity measure. It is also familiar to most researchers and practitioners in the area of depressive disorders.

Reliability and internal consistency:

The HAM-D is a multidimensional scale. This implies that the score of the specific item cannot be taken as a good predictor for the total score. Also, it means

that similar scores from two or three different patients can have variable clinical meanings. A moderate rating on many items can yield the similar score as a very high rating on few items.

A report from a recent study says that the internal consistency coefficient is 0.88 for HAM-D-24 item rating scale. A review of 70 studies on psychometric properties of the HAM-D shows that most of the HAM-D items have adequate reliability.

Inter-rater reliability:

A very high inter-rater reliability has been reported for HAM-D and is around 0.80 – 0.98. When the scale was administered, all the items showed adequate reliability.

Test- Retest reliability:

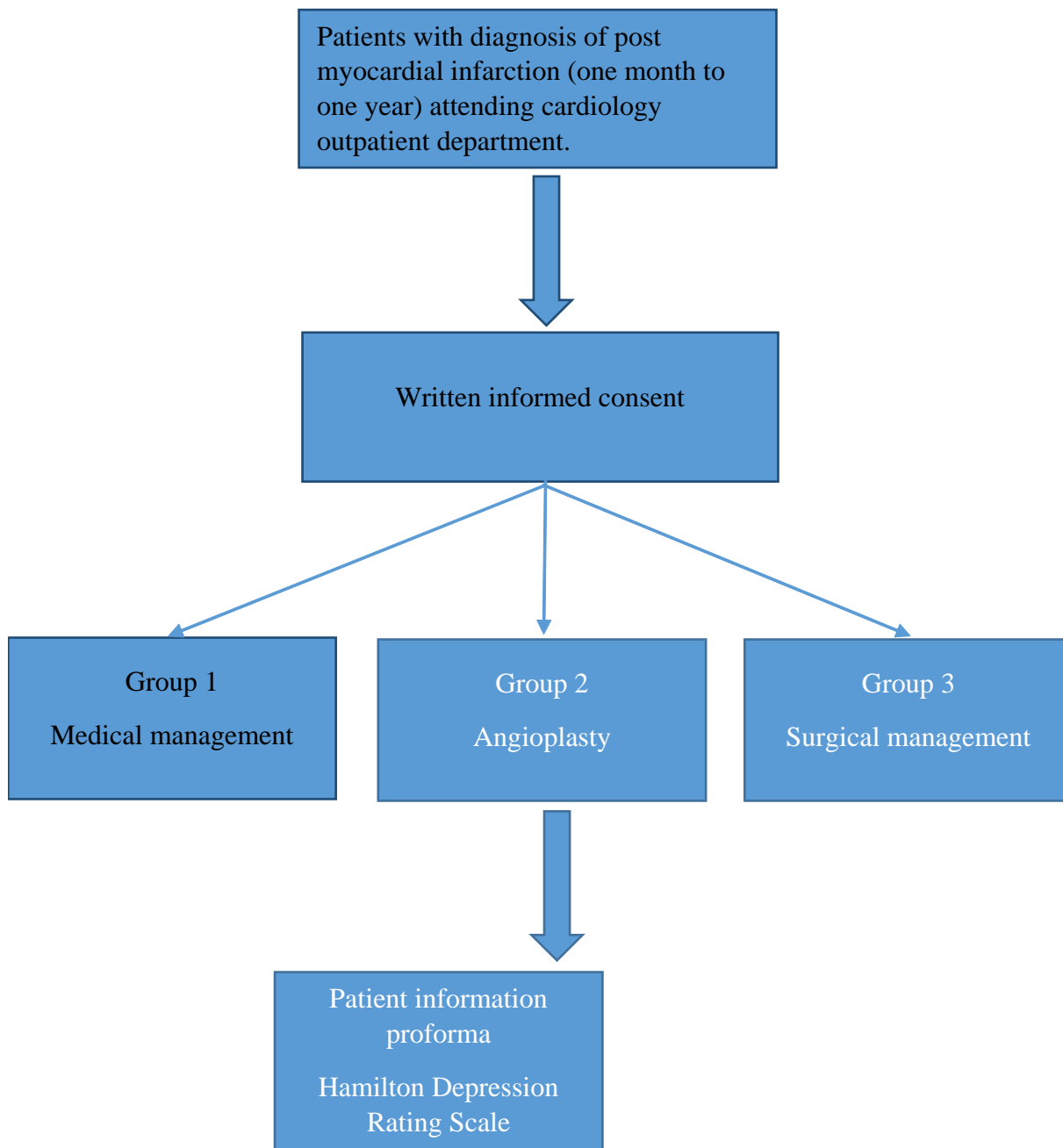
Test-retest reliability for the HAM-D is reported to be 0.81 which is considered as a high. This is the same even among minimally trained raters from various disciplines.

Validity:

HAM-D has been reported to have a validity score ranging from 0.65 to 0.90 with global measures of severity of depression. It is highly correlated with other clinician-rated measures such as MADRS – Montgomery – Asberg Depression rating scale.

Interpretation of HAM-D score:

Score	Severity of depression
7 or less	Normal
8-17	Mild
18-24	Moderate
25 and above	Severe



STUDY DESIGN:

Cross sectional study.

Convenient sampling.

STUDY PARTICIPANTS:

Patients attending cardiology outpatient department who qualify according to the inclusion and exclusion criteria mentioned.

STUDY LOCALE:

Cardiology outpatient department.

SAMPLE SIZE ESTIMATION:

Considering the previous similar studies and the number of patients attending cardiology outpatient department from the previous statistics we decided to have 180 patients.

SAMPLE SIZE:

First group – medical management: 69

Second group – angioplasty: 50

Third group – surgical management: 64

Total number of participants: 183

STATISTICAL ANALYSIS:

The data are reported as the mean +/- SD or the median, depending on their distribution.

The differences in quantitative variables between groups were assessed by means of the unpaired t test.

Comparison between groups was made by the Non parametricMann - Whitney test ANOVA was used to assess the quantitative variables.

A Chi Square test was used to assess differences in categorical variables between groups.

A p value of <0.05 using a two-tailed test was taken as being of significance for all statistical tests.

All data were analysed with a statistical software package (SPSS, version 16.0 for windows).

RESULTS

The overall sample consists of 183 patients. Among 183 patients, 69 patients received medical management, 50 patients received angioplasty and 64 patients received surgical management for their myocardial infarction.

First part of results include

- Study group distribution
- Age distribution
- Gender distribution

Second part of results include:

- Prevalence of depression in three groups
- Severity of depression in three groups
- Hamilton depression rating scale scores among three groups

Third part of results include:

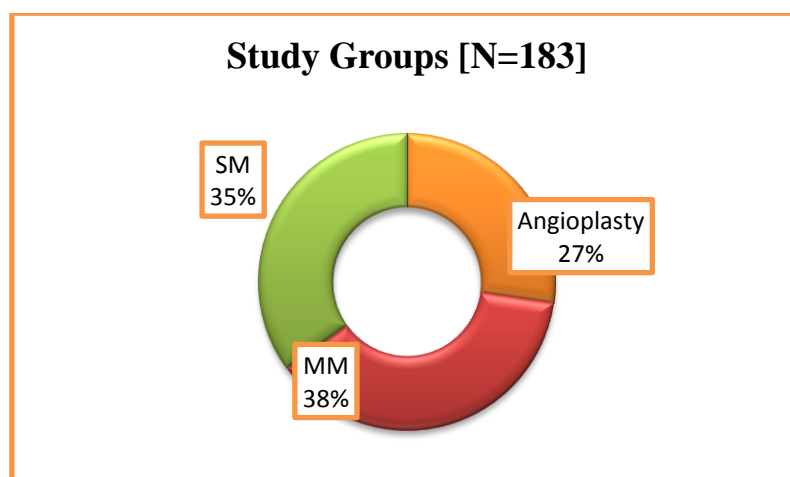
- Comparative analysis of co-variables such as socio-demographic features, dyslipidemia, hypertension, diabetes mellitus, coronary angiogram, left ventricular function and history of smoking among the three study groups.

STUDY GROUP:

Table 1: Number of patients in study group and their percentage

Study Groups	n	(%)
Angioplasty	50	27%
Medical Management	69	38%
Surgical Management	64	35%
Total	183	

Figures 1: Distribution of study groups in total population



In the study group, the total number were 183 myocardial infarction patients. Among them, 38 % received medical management, 27% received angioplasty and 35% received surgical management. In figure 2, SM indicates surgical management and MM indicates medical management.

AGE AND GENDER DISTRIBUTION:

Table 2: Age and gender distribution in total study groups

Age	Gender		Total	(%)
	Male	Female		
< 40	14	1	15	8%
41 - 60	81	14	95	52%
61 - 80	53	17	70	38%
> 80	3	0	3	2%
Total	151	32	183	100%

Above table 1 shows total of 15 individuals (8%) in below 40 years age group; 95 individuals (52%) in the age group between 41 to 60 years; 70 individuals (38%) in the age group from 61 to 80 years; 3 individuals (2%) in above 80 age groups.

Figure 2: Age distribution in male and female patients in the study groups

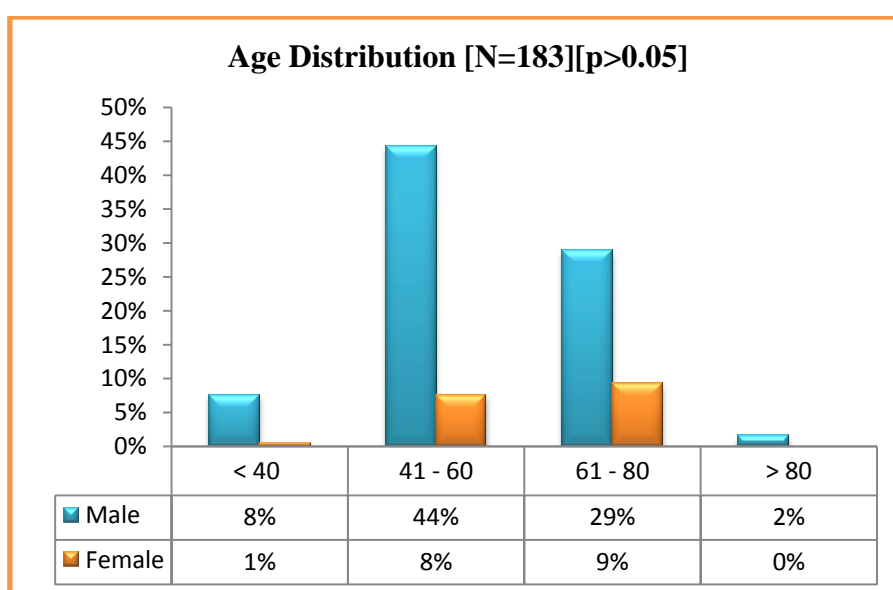


Figure 2 shows that among 183 patients, in the age group of less than 40 years 8% were male and 1% were female. In the age group 41 to 60 years 44% were male 8% were females. In the age group between 61 to 80 years the 29% were males and 9% were females. In the age group more than 80 years 2% males were present. There is no statistical significance between the three groups in relation to the gender.

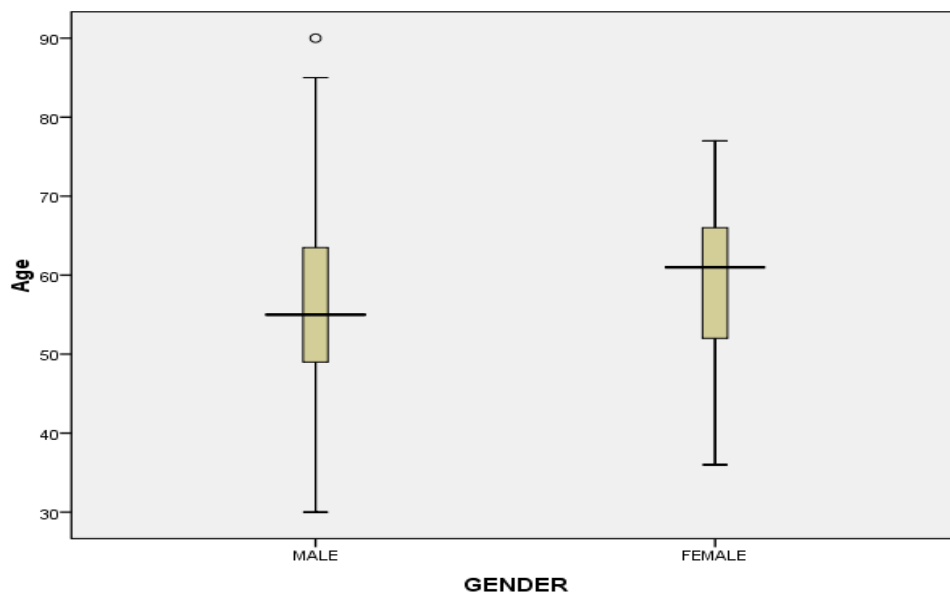
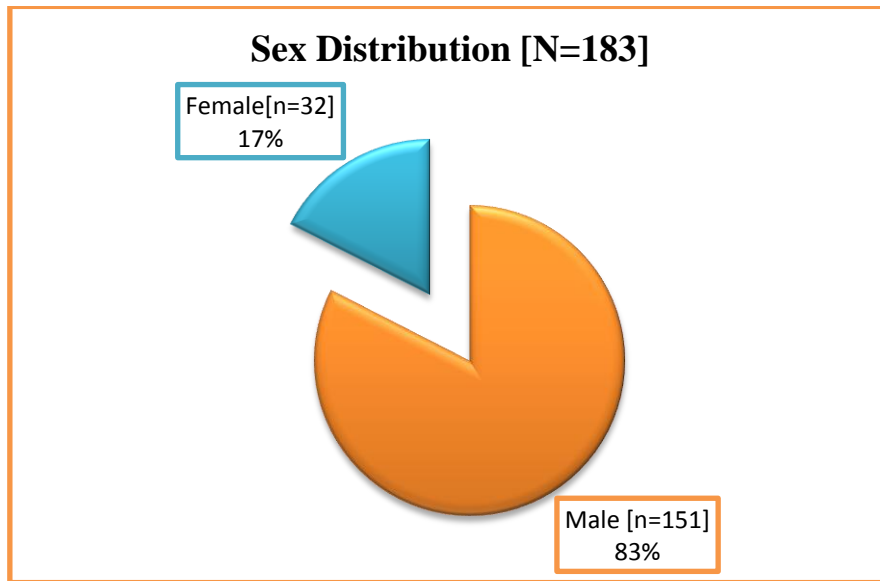


Figure 3: Age and gender distribution among the study population

Figure 3 shows, when compared with the male and female population the mean age for male is 56 and female is 59 and it is not statistically significant.

Figure 4: Sex distribution in the study groups



In total study sample of myocardial infarction patients 151 patients were male which is 83% and the remaining 32 patients were female which is around 17%.

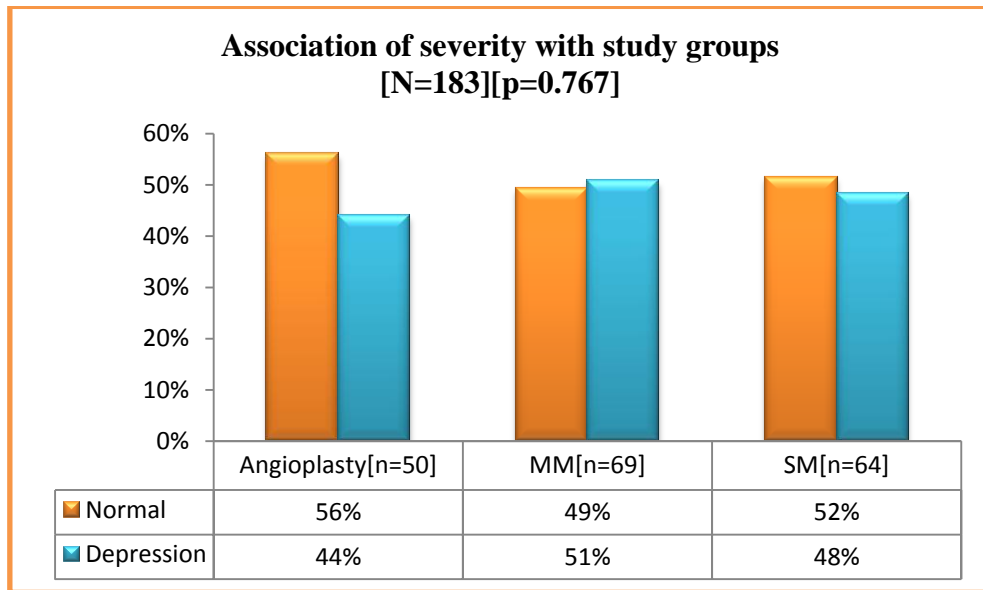
PREVALENCE OF DEPRESSION:

Table 3: Distribution of normal and depression patients in three groups and their percentage

	Study Groups			TOTAL	(%)
	Angioplasty	Medical Management	Surgical Management		
	Normal	28	34		
Depression	22	35	31	88	48%
Total	50	69	64	183	100%

Table 3 shows depression is seen in 22 patients from angioplasty group, 35 patients from medical management group and 31 patients from surgical management group. Total number of depressed patients is 88 which is around 48% of study population. Remaining 95 of the study population (52%) were normal that is they did not suffer depression.

Figure 5: Prevalence of depression in the study groups



This figure 5 shows depression is seen in 44% of angioplasty group, 51% of medical management group and 48 % of surgical management group. Normal patients that is who did not suffered depression were around 56% in angioplasty group, 49% in medical management group and 52% in surgical management groups. When compared between the normal and depression in these three groups the p value is around 0.767 which is not statistically significant.

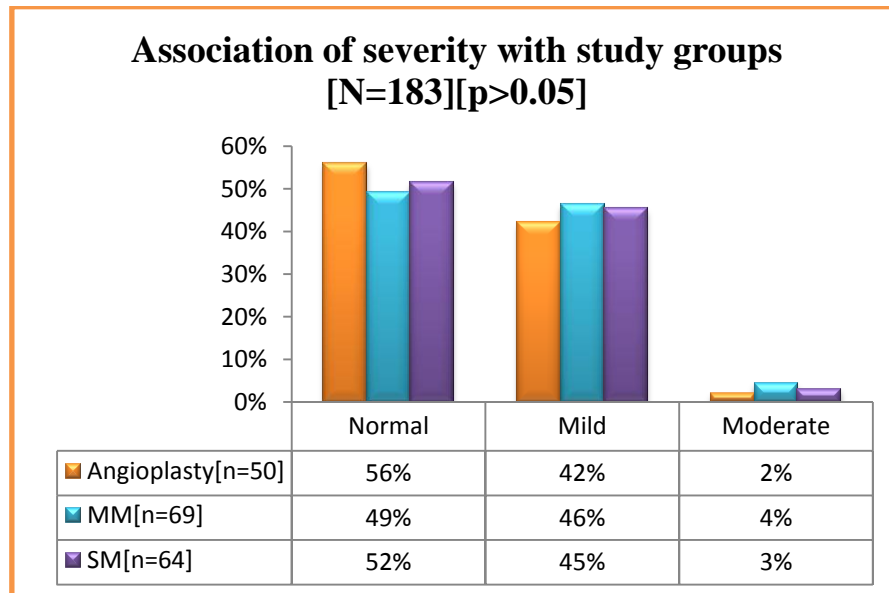
SEVERITY OF DEPRESSION IN THREE GROUPS

Table 4: Severity of depression in three groups

Severity	Study Groups			TOTAL	(%)
	Angioplasty	Medical Management	Surgical Management		
Normal	28	34	33	95	52%
Mild	21	32	29	82	45%
Moderate	1	3	2	6	2%
Total	50	69	64	183	

The above table shows mild depression is seen in 21 patients in angioplasty group, 32 patients in medical management group and 29 patients in surgical management group. The total number of patients with mild depression is 82 which is around 45% of patients. Moderate depression is seen in only one patient in angioplasty group, 3 patients in medical management group and 2 patients in surgical management group. The number of patients with moderate depression is 6 contributing around 2 %.

Figure 6: Association of severity of depression in three groups.



When compared between normal, mild and moderate depression in the three study groups, the p value is around 0.3 which is not statistically significant.

HAMILTON DEPRESSION RATING SCALE SCORES AMONG THREE GROUPS:

Table 5: Association of HAM D score in angioplasty patients

Severity	Mean	SD	95% CI for Mean		Minimum	Maximum	Sig
			Lower Bound	Upper Bound			
Normal	4.96	2.219	4.1	5.82	0	7	
Mild	9.86	1.982	8.95	10.76	8	14	
Moderate	19	.	.	.	19	19	<0.005
Total	7.3	3.61	6.27	8.33	0	19	

The above table shows the mean score in HAM D rating scale is around 5 in normal individuals, 10 in mild depression, 19 in moderate depression. When compared between normal, mild and moderate groups the p value is of less than 0.005 which is statistically significant and indicates moderate depression is lower than normal and mild depression group.

Table 6: Association of HAM -D score in medical management group

Severity	Mean	SD	95% CI for Mean		Minimum	Maximum	Sig
			Lower Bound	Upper Bound			
Normal	4.76	1.671	4.18	5.35	2	7	
Mild	10.62	2.524	9.71	11.54	8	17	
Moderate	19.33	0.577	17.9	20.77	19	20	<0.005
Total	8.12	4.289	7.09	9.15	2	20	

The above table shows the mean score in HAM D rating scale is around 5 in normal individuals, 10 in mild depression, 19 in moderate depression and when compared between the severity, moderate depression is significantly lower than the normal and mild depression groups and the p value is less than 0.005.

Table 7: Association of HAM- D score in surgical management groups

Severity	Mean	SD	95% CI for Mean		Minimum	Maximum	Sig
			Lower Bound	Upper Bound			
Normal	4.58	2.107	3.83	5.32	0	7	
Mild	10.72	2.89	9.62	11.82	8	16	
Moderate	21.5	2.121	2.44	40.56	20	23	<0.005
Total	7.89	4.623	6.74	9.05	0	23	

The above table shows the mean score in HAM D rating scale is around 4 in normal individuals, 10 in mild depression, 21 in moderate depression. When compared between the three groups, moderate depression is significantly lower than the other two groups and the p value of less than 0.005 which is statistically significant.

COMPARATIVE ANALYSIS OF CO-VARIABLES BETWEEN THREE GROUPS:

Comparative analysis of variables include the following:

Socio demographic factors:

- Age
- Gender
- Marital status
- Socioeconomic status

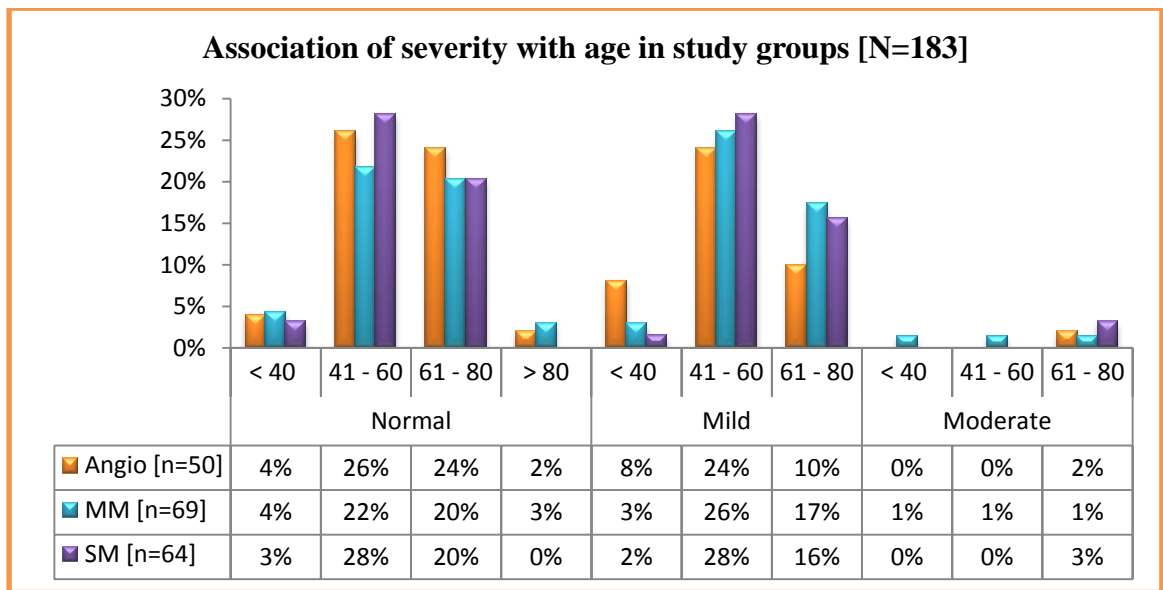
Other variables:

- Diabetes mellitus
- Hypertension
- Dyslipidemia
- Smoking
- Left ventricular function
- Coronary angiogram

SOCIO-DEMOGRAPHIC FEATURES AND THEIR ASSOCIATION WITH DEPRESSION IN THE THREE STUDY GROUPS:

AGE AND SEVERITY OF DEPRESSION:

Figure 7: Association of age and the severity of depression in the three study groups.



The above figure 7 explains that in angioplasty group, the percentage of mild depression is seen in 8% of patients below 40 years of age, 24% of patients in between 41 to 60 years of age and 10% in 61 to 80 years of age. Moderate depression is seen only 2 % in 61 to 80 age group.

When compared between these age groups and severity of depression in angioplasty group the P value is 0.484 which is not statistically significant.

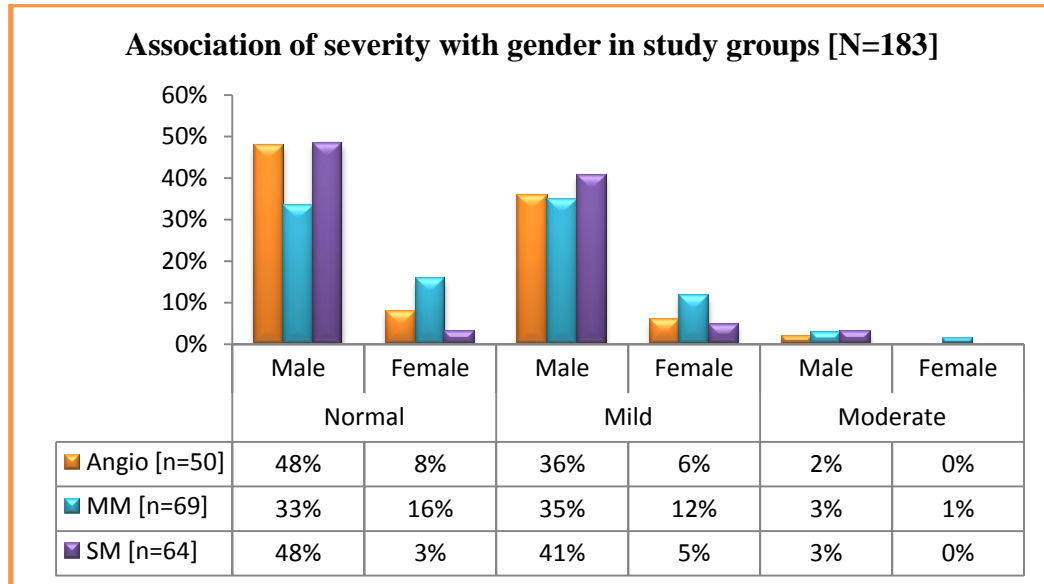
In the medical management group, the percentage of mild depression is seen in 3% of patients in below 40 age group, 26% in between 41 to 60 age group and 1% in 61 to 80 years age group. Moderate depression is around 1% in each group.

When compared between these age groups and severity of depression in medical management the P value is 0.53 which is not statistically significant.

In the surgical management group, the percentage of mild depression is seen in 2% of patients in below 40 age group, 28% of patients in 41 to 60 years age group and 16% patients in 61 to 80 years age group. Moderate depression is seen only 3 % in 61 to 80 age group. When compared between these age groups and severity of depression in surgical management group the p value is 0.449 which is not statistically significant.

GENDER AND SEVERITY OF DEPRESSION:

Figure 8: Association of gender and severity of depression in three study groups



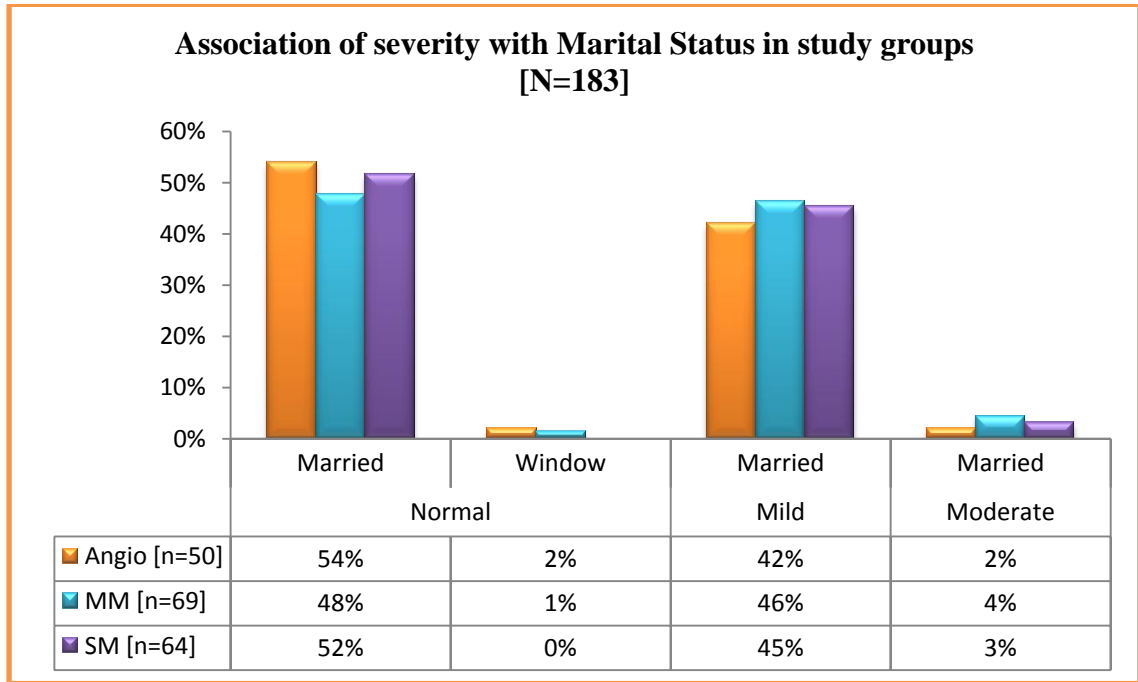
The above figure 8 shows that in angioplasty group, mild depression is seen in 36% of males and 6% of females and moderate depression is seen in 2% of males only. When compared between gender and severity of depression in angioplasty group the p value is 0.92 that is statistically not significant.

In medical management group, mild depression is seen in 35% of males and 12% of females and moderate depression is seen in 3% of males only. When compared between gender and severity of depression in the medical management group the p value is 0.794 which is statistically not significant.

In surgical management group, mild depression is seen in 41 % of males and 5% of females and moderate depression is seen in 3% of males only. When compared between the gender and severity of depression in the surgical management group the p value is 0.753 which is statistically not significant.

MARITAL STATUS AND SEVERITY OF DEPRESSION:

Figure 9: Association between the marital status and severity of depression in three study groups



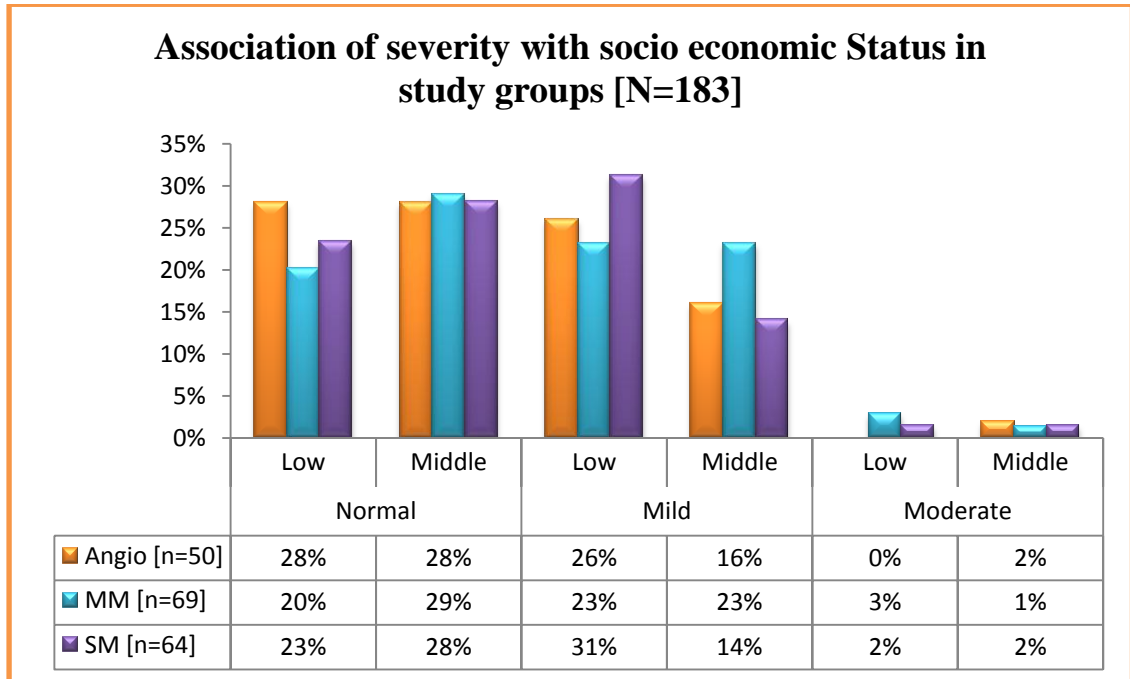
The above figure 9 shows that, in angioplasty group 42% of married patients have mild depression and 2% of them have moderate depression. When comparing the marital status and severity of depression in angioplasty group the p value is 0.67 which is statistically not significant.

In medical management group, married persons with mild depression is around 46%; moderate depression is seen in 4%. When comparing the marital status and severity of depression in angioplasty group the p value is 0.593 which is statistically not significant.

In surgical management group, 45% of married patients had mild depression, 3% of them had moderate depression. This is also not statistically significant.

SOCIOECONOMIC STATUS AND SEVERITY OF DEPRESSION:

Figure 10: Association of socio economic status with severity of depression in the three study groups



The above figure 10 shows, in angioplasty group 26% of patients in the low socio economic status were having mild depression and 16% of patients in the middle socio economic status were having mild depression. 2% had moderate depression who were in the middle socio economic status. The p value is around 0.39 which is not statistically significant between the low and middle socioeconomic groups.

In the medical management group, mild depression was seen in 23% of patients in each of the two socio economic status (i.e.) low and middle. 3% had moderate depression who belonged to low socioeconomic status and 1% had moderate depression in the middle socioeconomic status. The p value is around 0.596 which is not statistically significant.

In surgical management group, in the low socio economic status, mild depression is seen in 31 % and moderate depression is seen in 2%. In middle socio economic status mild depression were seen in 14% and moderate depression is seen in 2%. The p value is around 0.174 which is not statistically significant.

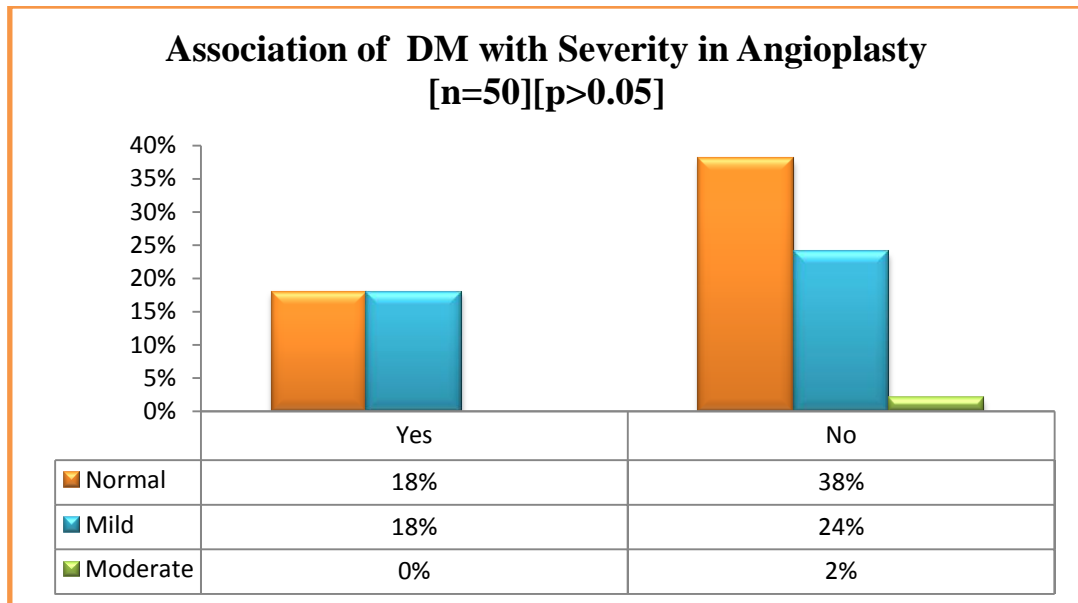
DIABETES MELLITUS AND DEPRESSION:

Table 8: Association between diabetes mellitus and severity of depression in angioplasty patients

DM	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	9	9	0	18	36%
No	19	12	1	32	64%
Total	28	21	1	50	100%

The above table shows that in diabetes mellitus individuals from angioplasty group 9 were mildly depressed and 9 individuals were noted to be normal. In the absence of diabetes 12 patients had mild depression and 19 patients were normal.

Figure 11: Association of diabetes mellitus and the severity of depression in angioplasty patients



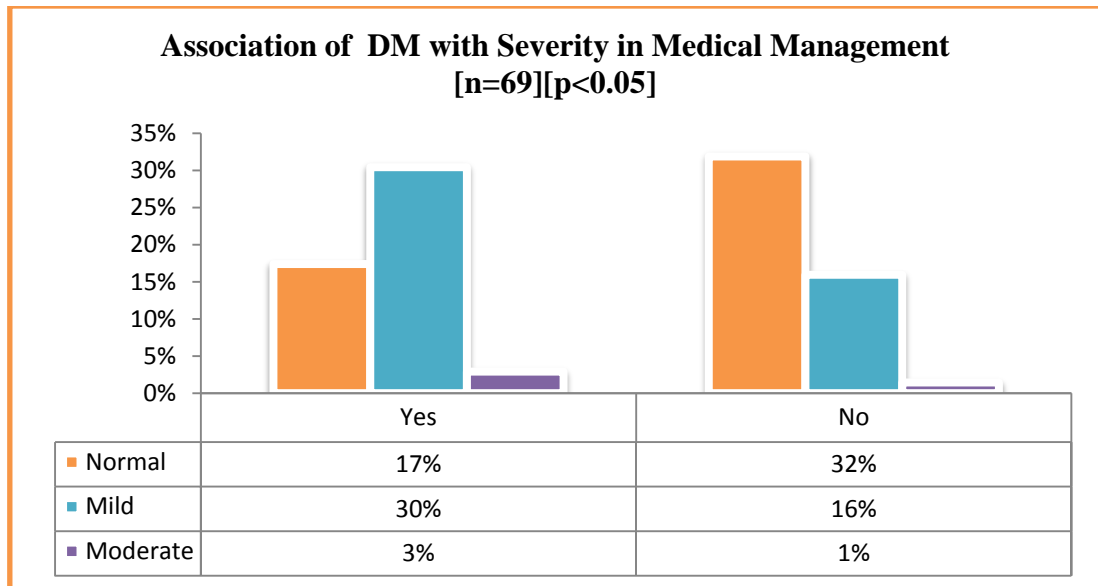
The above table shows, in the presence of diabetes among angioplasty group 18% were mildly depressed and 18% were normal. In the absence of depression 24% were mildly depressed, 38% were normal and 2% were moderately depressed. When compared between the diabetes mellitus and severity of depression p value is 0.557 which is not statistically significant.

Table 9: Association between diabetes mellitus and severity of depression in medical management patients

DM	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	12	21	2	35	51%
No	22	11	1	34	49%
Total	34	32	3	69	100%

The above table shows that in diabetes mellitus individuals from medical management group 21 were mildly depressed, 2 had moderate depression and 12 individuals were noted to be normal. In the absence of diabetes 11 patients had mild depression, 22 patients were normal and one had moderate depression.

Figure 12: Association of diabetes mellitus and the severity of depression in medical management patients



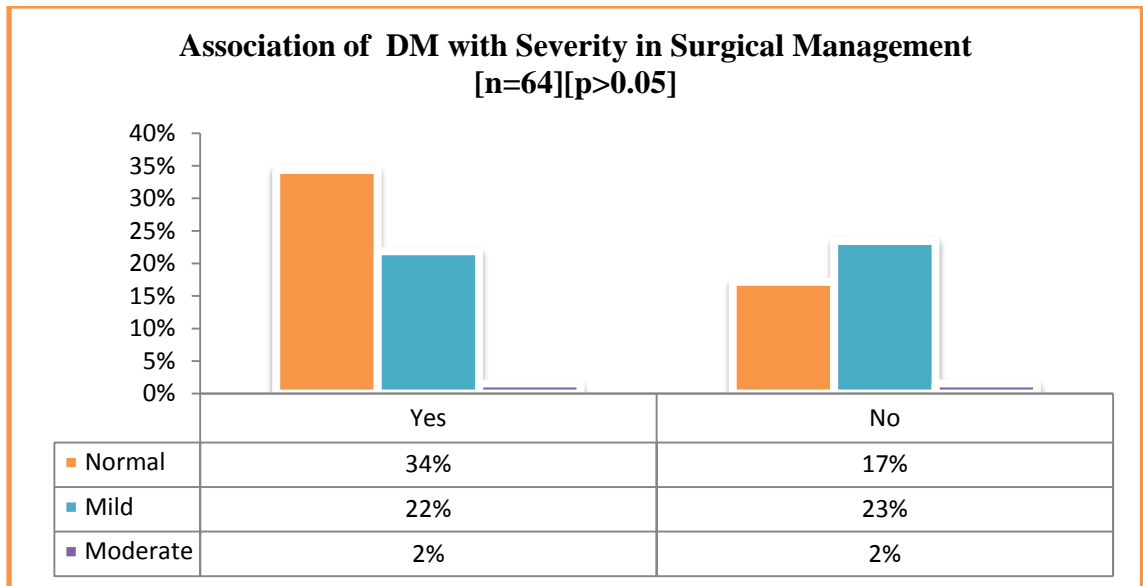
The above table shows that in the presence of diabetes mellitus in medical management group 30% were mildly depressed, 3% had moderate depression and 17% were normal. In the absence of depression 16% were mildly depressed, 32% were normal and 1% were moderately depressed. When compared between the diabetes mellitus and severity of depression p value is **0.041** which is statistically significant.

Table 10: Association between diabetes mellitus and severity of depression in surgical management patients

DM	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	22	14	1	37	58%
No	11	15	1	27	42%
Total	33	29	2	64	100%

The above table shows that in diabetes mellitus individuals from the surgical management group, 14 were mildly depressed, 1 individual was moderately depressed and 22 individuals were noted to be normal. In the absence of diabetes 15 patients had mild depression, 1 individual had moderate depression and 11 patients were normal.

Figure 13: Association of diabetes mellitus and the severity of depression in surgical management patients



The above table shows that in the presence of diabetes in surgical management group, 22% were mildly depressed, 2% were moderately depressed and 34% were normal. In the absence of depression 23% were mildly depressed, 17% were normal and 2% were moderately depressed. When compared between the diabetes mellitus and severity of depression the p value is 0.334 which is not statistically significant.

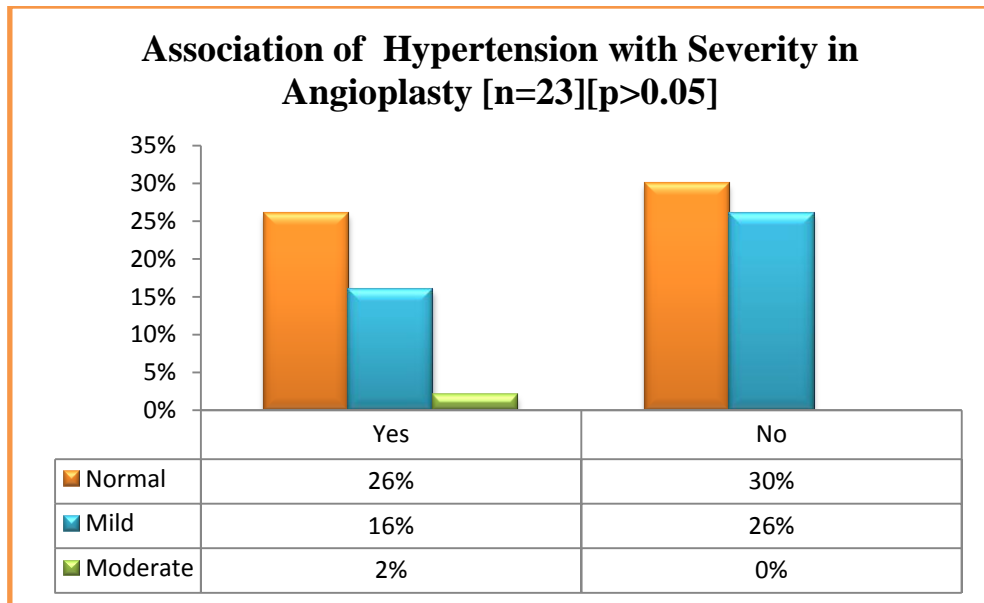
HYPERTENSION AND DEPRESSION:

Table 11: Association between the hypertension and severity of depression in angioplasty group

Hypertension	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	13	8	1	22	44%
No	15	13	0	28	56%
Total	28	21	1	50	100%

The above table shows the presence and absence of hypertension in the angioplasty group. Among 50 patients 22 suffered hypertension. Among the 22 hypertensive patients, 8 had mild depression, 1 had moderate depression and 13 individuals were noted to be normal. In absence of hypertension 13 were found to be mildly depressed and 15 were noted to be normal.

Figure 14: Association between the hypertension and severity of depression in angioplasty patients



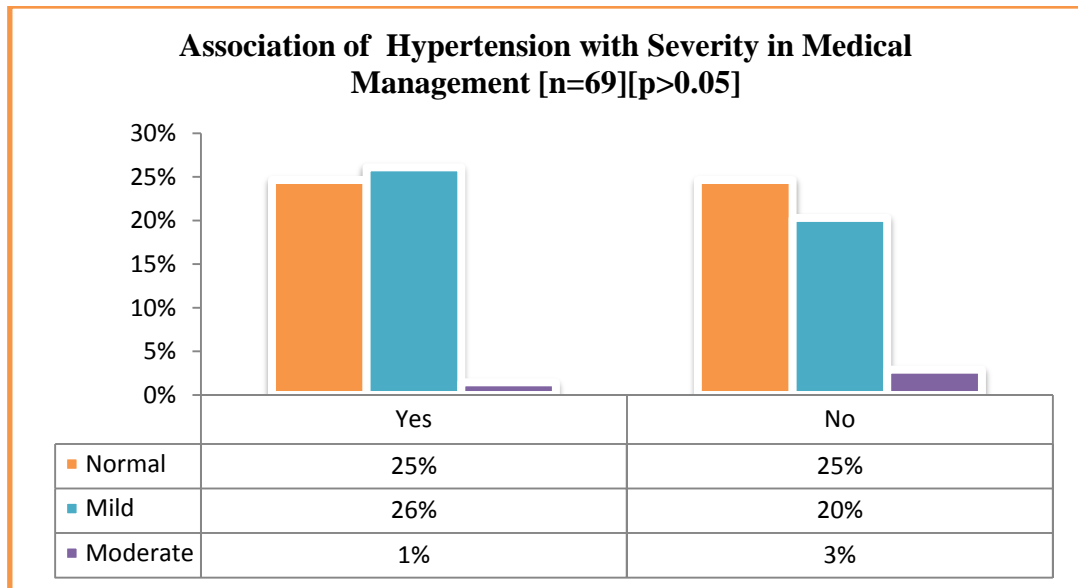
In the presence of hypertension in angioplasty group 16% were mildly depressed, 26% were normal and 2% had moderate depression. In the absence of hypertension 26% were mildly depressed and 30% were normal. When compared between hypertension and severity of depression the p value is 0.441 which is not statistically significant.

Table 12: Association between the hypertension and severity of depression in medical management group

Hypertension	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	17	18	1	36	52%
No	17	14	2	33	48%
Total	34	32	3	69	

The above table shows in this medical management group with hypertension, 17 had mild depression, 1 had moderate depression and 17 individuals were noted to be normal. In absence of hypertension 14 were found to be mildly depressed, 17 were noted to be normal and 2 had moderate depression.

Figure 15: Association between the hypertension and severity of depression in medical management patients



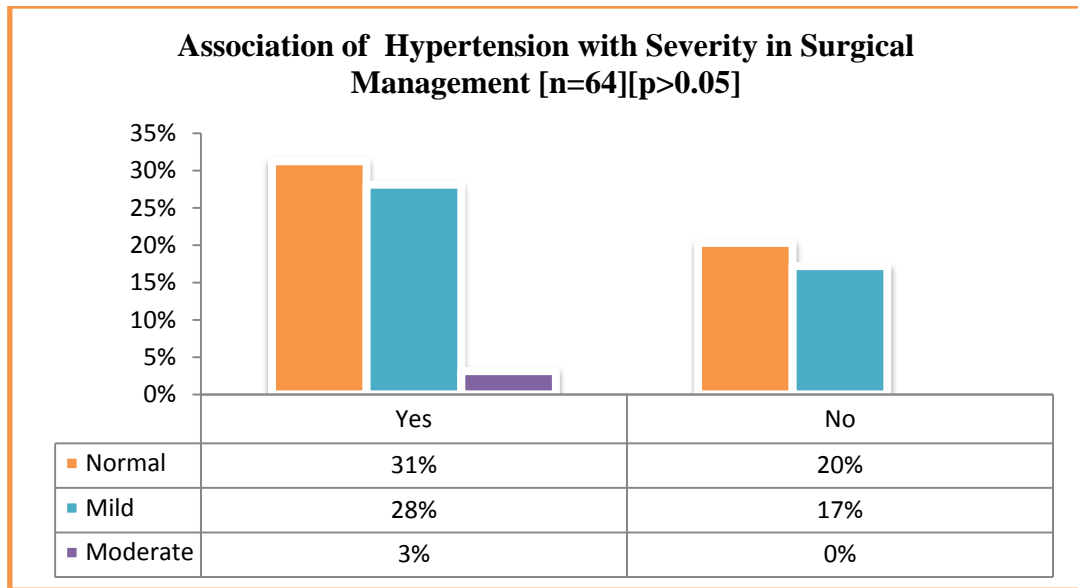
In the hypertension patients from medical management group 26% were mildly depressed, 25% were normal and 1% had moderate depression. In the absence of hypertension 20% were mildly depressed and 25% were normal. When compared between hypertension and severity of depression the p value is more than 0.005 and hence is not statistically significant.

Table 13: Association between the hypertension and severity of depression in surgical management patients.

Hypertension	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	20	18	2	40	63%
No	13	11	0	24	38%
Total	33	29	2	64	100%

The above table shows the surgical management group with hypertension in which 18 had mild depression, 2 had moderate depression and 20 individuals were noted to be normal. In absence of hypertension 11 were found to be mildly depressed and 13 were noted to be normal.

Figure 16: Association between the hypertension and severity of depression in surgical management group



In the hypertension patients from surgical management group 28% were mildly depressed, 31% were normal and 3% had moderate depression. In the absence of hypertension 17% were mildly depressed and 20% were normal. When compared between hypertension and severity of depression the p value is 0.525 which is not statistically significant.

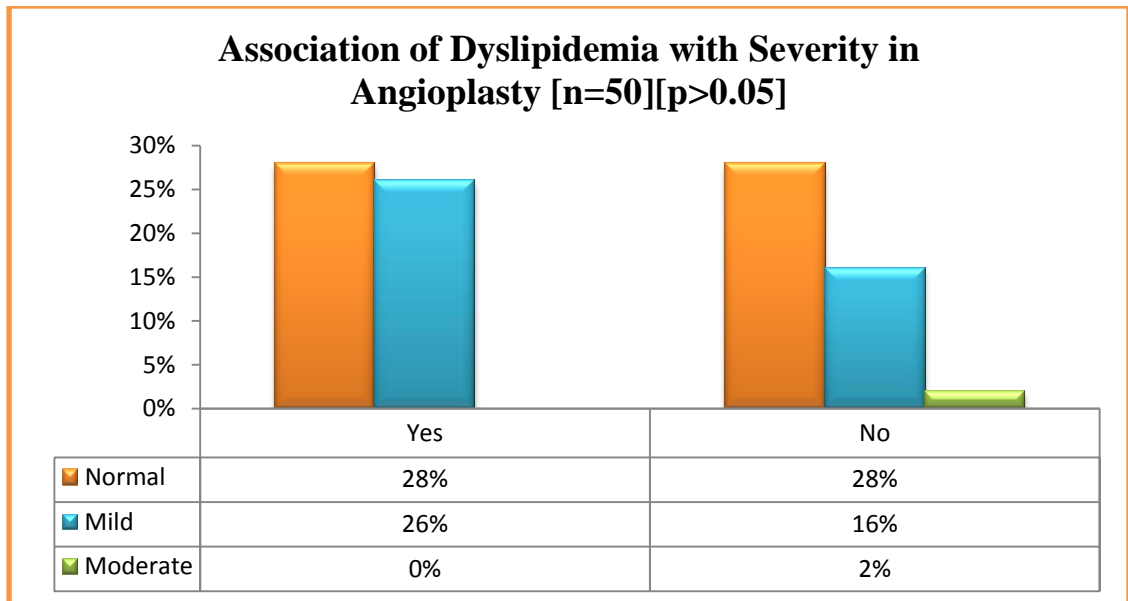
DYSLIPIDEMIA AND DEPRESSION:

Table 14: Association between dyslipidemia and severity of depression in angioplasty patients

Dyslipidemia	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	14	13	0	27	54%
No	14	8	1	23	46%
Total	28	21	1	50	100%

The above table shows that 13 mild depression and 14 normal individuals were seen in patients with dyslipidemia. 8 mild depression, 1 moderate depression and 14 normal individuals were seen in the absence of dyslipidemia in angioplasty patients.

Figure 17: Association between dyslipidemia and severity of depression in angioplasty patients



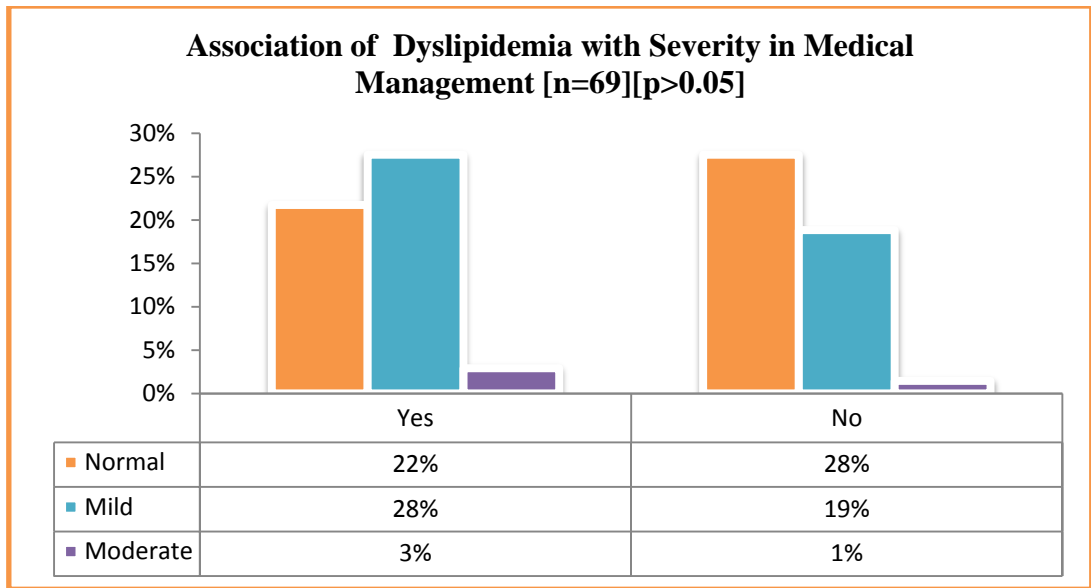
In the angioplasty group with dyslipidemia, 26% were mildly depressed, 28% were normal. In the angioplasty group without dyslipidemia, 16% had mild depression, 2% were moderately depressed and 28% were noted to be normal. When compared between dyslipidemia and severity of depression in the angioplasty group the p value is 0.474 which is statistically not significant.

Table 15: Association between dyslipidemia and severity of depression in medical management patients

Dyslipidemia	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	15	19	2	36	52%
No	19	13	1	33	48%
Total	34	32	3	69	100%

The above table shows the presence and absence of dyslipidemia in the medical management group. Among 69 of them, 36 patients had dyslipidemia. In the medical management group with dyslipidemia, 19 had mild depression, 2 had moderate depression and 15 were normal. In the above group without dyslipidemia 13 had mild depression, 1 had moderate depression and 19 were not depressed.

Figure 18: Association between dyslipidemia and severity of depression in medical management patients.



In the medical management group with dyslipidemia, 28% had mild depression, 3% had moderate depression and 22% were normal. In the above group without dyslipidemia 19% had mild depression, 1% had moderate depression and 28% were not depressed.

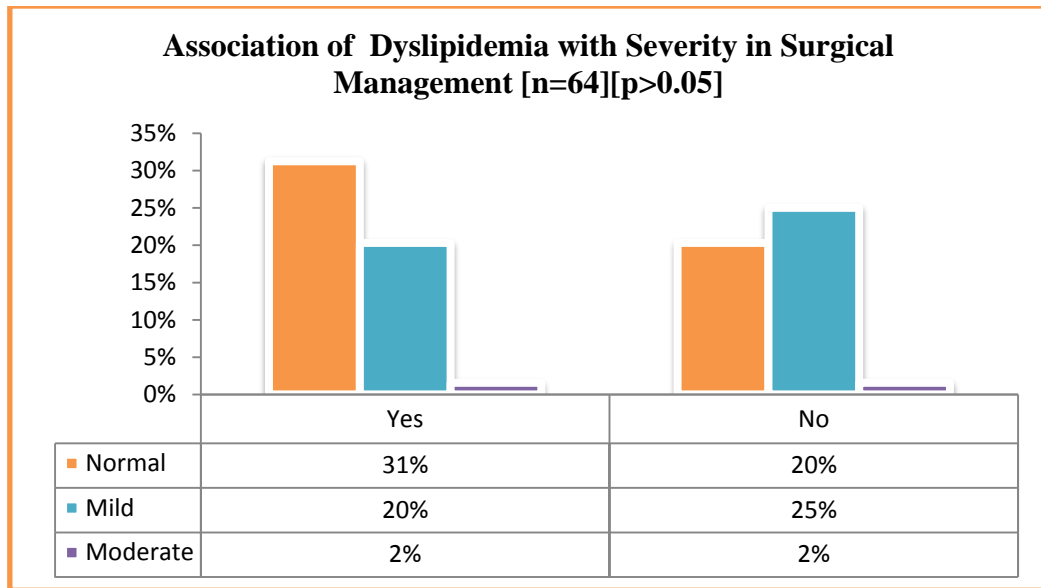
When compared between dyslipidemia and severity of depression in the medical management group, the p value is 0.406 which is statistically not significant.

Table 16: Association between dyslipidemia and severity of depression in surgical management patients

Dyslipidemia	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	20	13	1	34	53%
No	13	16	1	30	47%
Total	33	29	2	64	100%

The above table shows presence and absence of dyslipidemia in the surgical management group. Among 64 of them 34 had dyslipidemia. In patients with dyslipidemia 13 had mild depression, 1 had moderate depression and 14 were normal individuals. In patients without dyslipidemia 16 had mild depression, 1 had moderate depression and 13 were normal.

Figure 19: Association between dyslipidemia and severity of depression in surgical management patients



In the surgical group, dyslipidemia patients had 20% of mild depression, 2% of moderate depression and 31% were normal. In the absence of dyslipidemia, patients in surgical management group had 25 % of mild depression, 2% of moderate depression and 20% of normal persons. When compared between dyslipidemia and severity of depression in the surgical management group the p value is 0.46 which is statistically not significant.

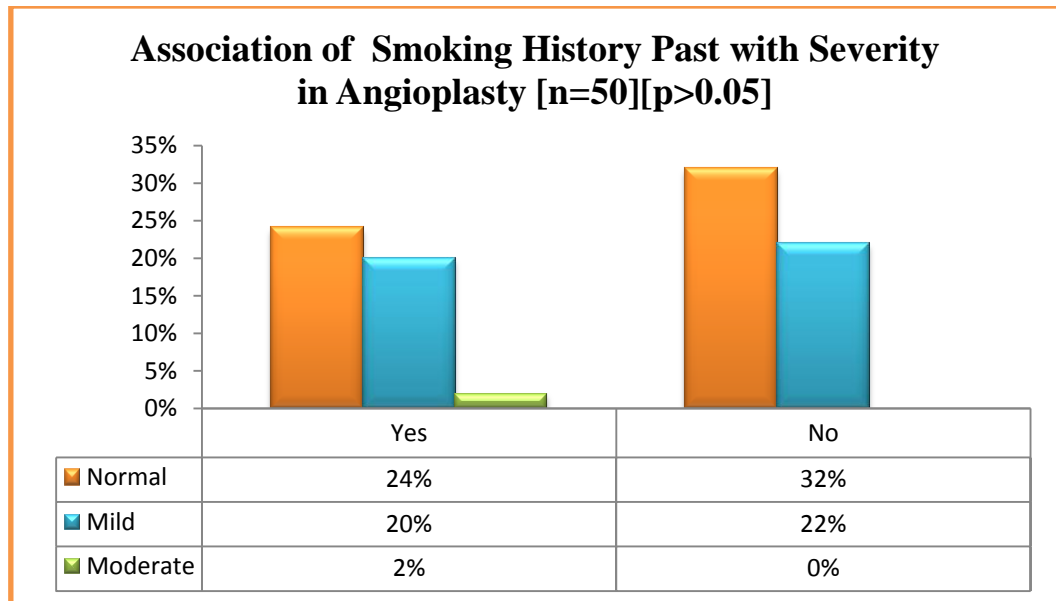
SMOKING AND DEPRESSION:

Table 17: Association between the past smoking history and the severity of depression in angioplasty patients

Smoking History – Past	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	12	10	1	23	46%
No	16	11	0	27	54%
Total	28	21	1	50	100%

The above table shows that in the presence of smoking, 10 individuals were mildly depressed, 12 were normal and one had moderate depression. In the absence of smoking 11 had mild depression and 16 individuals were normal.

Figure 20: Association between the past smoking history and severity of depression in angioplasty group



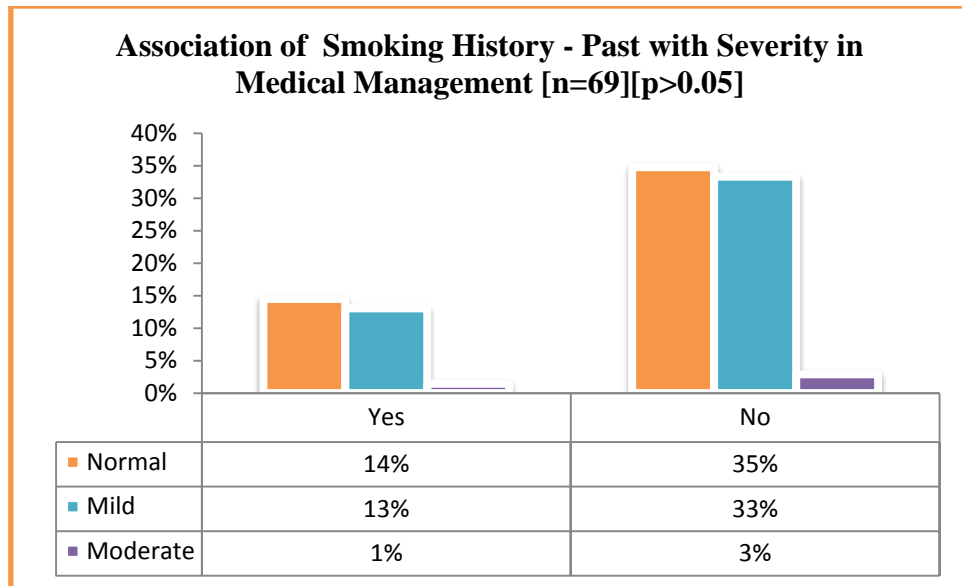
The above figure shows in the presence of past smoking history 20% were mildly depressed, 2% were moderately depressed and 24% were normal. In the absence of smoking history 22% were mildly depressed and 32% were normal. When compared between these variables the p value is 0.52 which is not statistically significant.

Table 18: Association between the past smoking history and the severity of depression in medical management group

Smoking History- Past	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	10	9	1	20	29%
No	24	23	2	49	71%
Total	34	32	3	69	100%

The above table shows that, in the presence of smoking 9 individuals were mildly depressed, 10 were normal and one had moderate depression. In the absence of smoking 23 had mild depression, 2 had moderate depression and 23 individual were normal.

Figure 21: Association between the past smoking history and severity of depression in medical management group



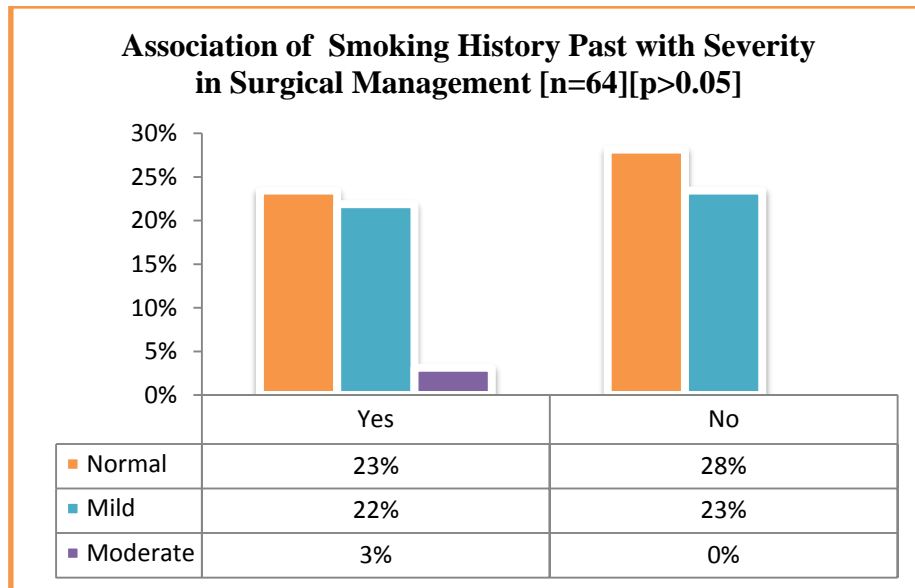
The above figure shows that, in the presence of past smoking history 13% were mildly depressed, 1 % were moderately depressed and 14% were normal. In the absence of smoking history 33% were mildly depressed, 3% had moderate depression and 35 % were normal. When compared between these variables the p value is 0.979 which is not statistically significant.

Table 19: Association between the past smoking history and the severity of depression in surgical management group

Smoking History - Past	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
Yes	15	14	2	31	48%
No	18	15	0	33	52%
Total	33	29	2	64	100%

The above table shows, in the presence of smoking 14 individuals were mildly depressed, 15 were normal and 2 had moderate depression. In the absence of smoking 15 had mild depression and 18 individual were normal.

Figure 22: Association between the past smoking history and severity of depression in surgical management group



The above figure shows that in the presence of past smoking history 22% were mildly depressed, 3% were moderately depressed and 23% were normal. In the absence of smoking history 23% were mildly depressed and 28% were normal. When compared between these variables the p value is 0.325 which is not statistically significant.

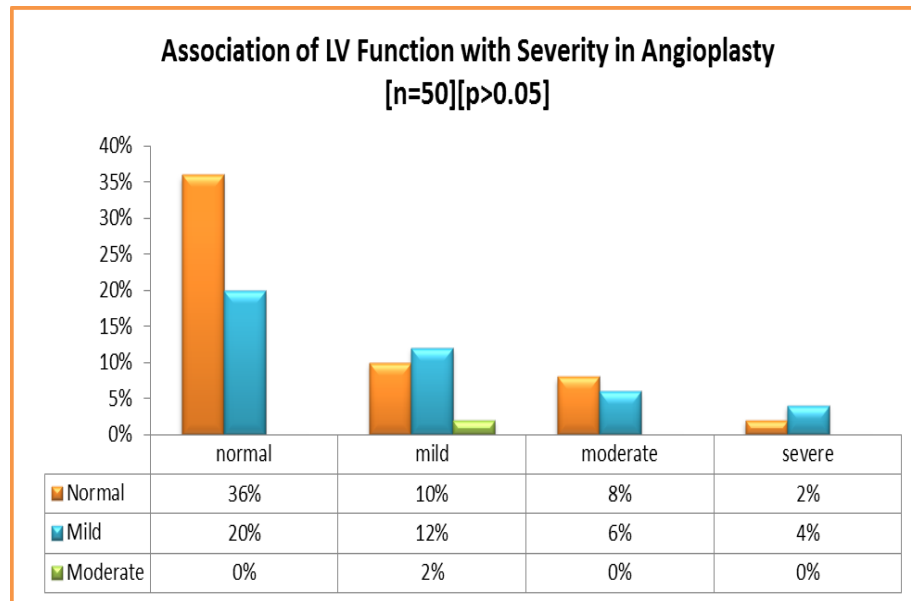
LEFT VENTRICULAR DYSFUNCTION AND DEPRESSION:

Table 20: Association of left ventricular function and severity of depression in angioplasty group

LV Function	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
normal	18	10	0	28	56%
mild	5	6	1	12	24%
moderate	4	3	0	7	14%
severe	1	2	0	3	6%
Total	28	21	1	50	100%

The above table shows, in normal left ventricular function patients, mild depression is seen in 10 patients and 18 patients were normal. In mild left ventricular dysfunction, mild depression was seen in 6 patients, moderate depression was seen in 1 patient and 5 patients were normal. In moderate left ventricular dysfunction 4 were normal patients and 3 had mild depression. In severe left ventricular dysfunction 2 patient had mild depression, and one patient was normal.

Figure 23: Association between the left ventricular function and severity of depression in angioplasty group



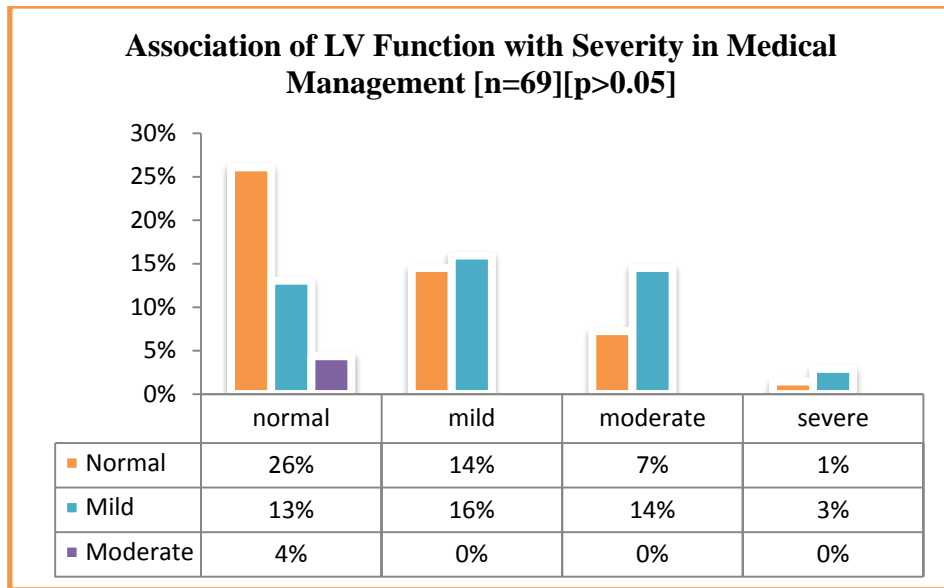
The above figure shows that in mild left ventricular dysfunction in angioplasty group 12% had mild depression, 2% had moderate depression and 10% were normal. Moderate left ventricular dysfunction group had mild depression of around 6% and 8% were normal. Severe left ventricular dysfunction group had 4% of mild depression and 2% were normal. In the normal left ventricular function 20% were mildly depressed and 36% were normal. When compared between these variables the p value is 0.172 which is not statistically significant.

Table 21: Association of left ventricular function and severity of depression in medical management group

LV Function	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
normal	18	9	3	30	43%
mild	10	11	0	21	30%
moderate	5	10	0	15	22%
severe	1	2	0	3	4%
Total	34	32	3	69	

The above table shows, in normal left ventricular function patients, mild depression is seen in 9 patients, 18 patients were normal and 3 had moderate depression. In mild left ventricular dysfunction, mild depression was seen in 11 patients and 10 patients were normal. In moderate left ventricular dysfunction normal patients were around 5 and 10 had mild depression. In severe left ventricular function 2 patients had mild depression, normal patient was around one.

Figure 24: Association between the left ventricular function and severity of depression in medical management group



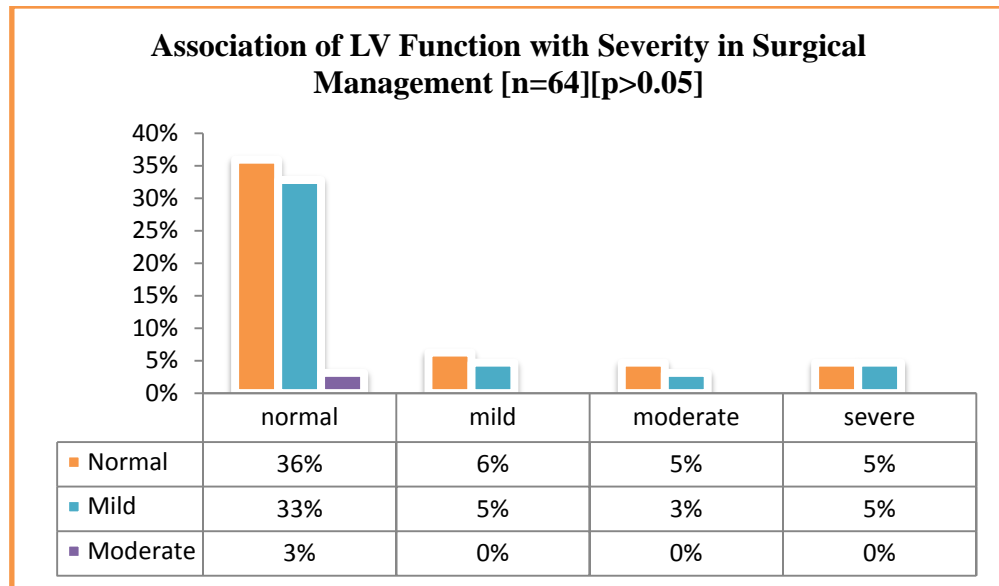
The above figure shows in mild left ventricular dysfunction group in angioplasty patients, mild depression was around 16% and 14% were normal. In moderate left ventricular dysfunction, mild depression was around 14% and 7% were normal. Severe left ventricular dysfunction has 3% of mild depression, 1% were normal. In the normal left ventricular function 13% were mildly depressed, 26% were normal and 4% had moderate depression. When compared between these variables the p value is 0.172 which is not statistically significant.

Table 22: Association of left ventricular function and severity of depression in surgical management group

LV Function	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
normal	23	21	2	46	72%
mild	4	3	0	7	11%
moderate	3	2	0	5	8%
severe	3	3	0	6	9%
Total	33	29	2	64	100%

The above table shows that in patients with normal left ventricular function, mild depression is seen in 21 patients, 2 were moderately depressed and 23 patients were normal. In mild left ventricular dysfunction, mild depression was seen in 3 patients and 4 patients were normal. In moderate left ventricular dysfunction normal patients were around 3 and 2 had mild depression. In severe left ventricular dysfunction 3 patients had mild depression.

Figure 25: Association between the left ventricular function and severity of depression in surgical management group



The above figure shows that in mild left ventricular dysfunction in angioplasty patients, mild depression was around 5% and 6% were normal. Moderate left ventricular dysfunction group had mild depression of 3% and 5% were normal. Severe left ventricular dysfunction has 5% of mild depression and 5% were normal. In the normal left ventricular function 33% were mildly depressed, 3% were moderately depressed and 36% were normal. When compared between these variables the p value is 0.449 which is not statistically significant.

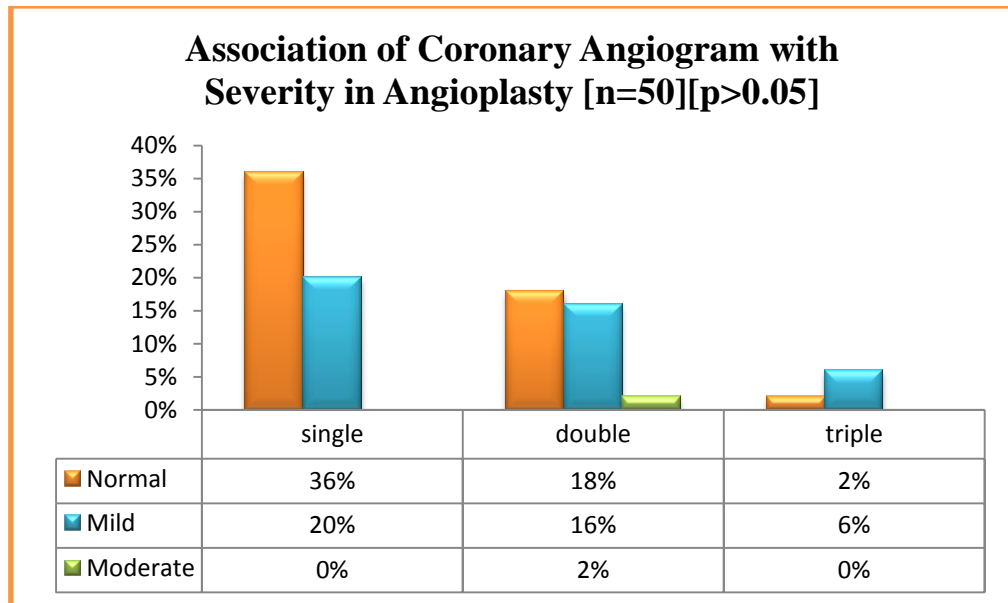
CORONARY ANGIOGRAM AND DEPRESSION:

Table 23: Association of Coronary Angiogram with Severity of depression in angioplasty patients.

Coronary	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
single	18	10	0	28	56%
double	9	8	1	18	36%
triple	1	3	0	4	6%
Total	28	21	1	50	100%

The above table shows in patients with single vessel disease 10 had mild depression and 18 were normal individuals. In double vessel disease 8 individuals were mildly depressed, 9 were normal and one individual had moderate depression. In triple vessel disease 3 patients were found to have mild depression and one individual was found to be normal.

Figure 26: Association of coronary angiogram and severity of depression in angioplasty patients



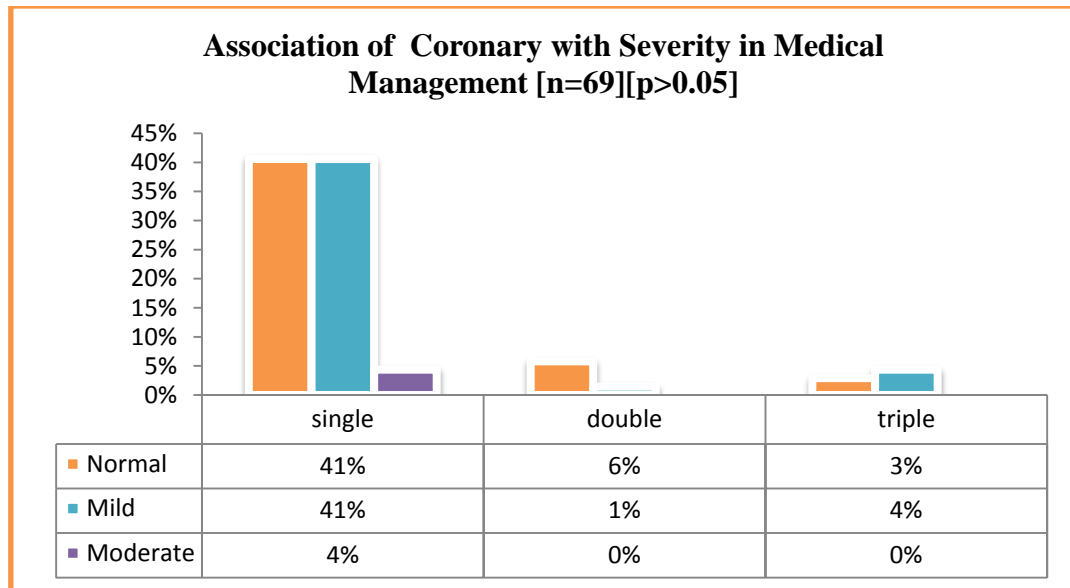
In single vessel disease 20% were found to have mild depression and 36% were normal. In double vessel disease 16% were mildly depressed, 2% were moderately depressed and normal patients were around 18%. In triple vessel disease 6% had mild depression and 2% were normal individuals. When compared between these variables the p value is around 0.373 which is not statistically significant.

Table 24: Association of Coronary Angiogram with Severity of depression in medical management group

Coronary	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
single	28	28	3	59	86%
double	4	1	0	5	7%
triple	2	3	0	5	7%
Total	34	32	3	69	100%

The above table shows in single vessel disease mild depression were around 28 and normal individuals were 28. In double vessel disease 1 individual was mildly depressed and 4 were normal. In triple vessel disease 3 patients were found to have mild depression and two individual were found to be normal.

Figure 27: Association of coronary angiogram and severity of depression in medical management group



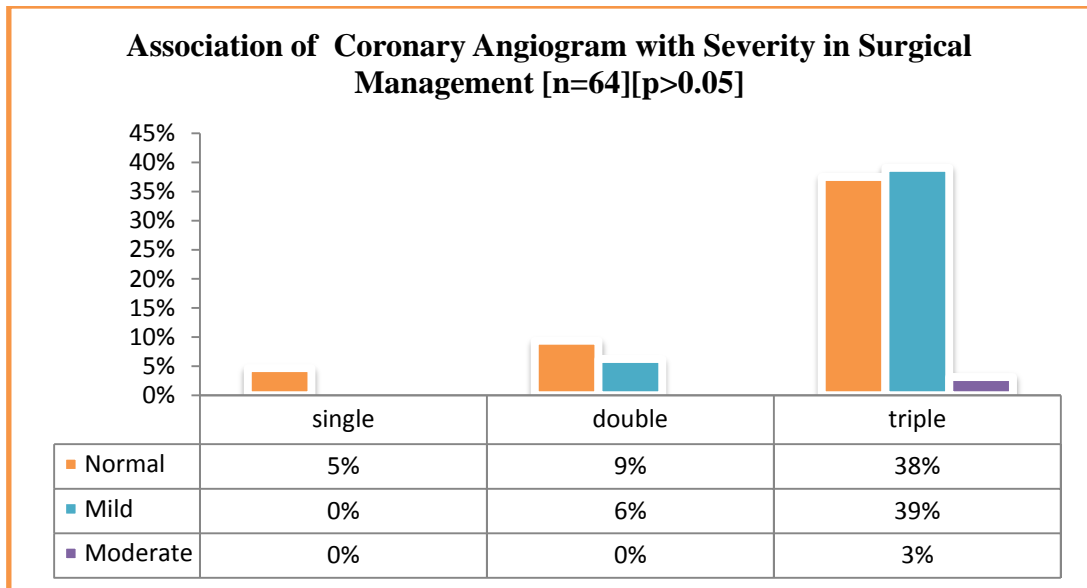
In single vessel disease 41% were found to have mild depression, 4% had moderate depression and 41% were normal. In double vessel disease 1% were mildly depressed and normal patients were around 6%. In triple vessel disease 4% had mild depression and 3% were normal individuals. When compared between these variables the p value is around 0.634 which is not statistically significant.

Table 25: Association of Coronary Angiogram with Severity of depression in surgical management group

Coronary	Severity			TOTAL	(%)
	Normal	Mild	Moderate		
single	3	0	0	3	5%
double	6	4	0	10	16%
triple	24	25	2	51	80%
Total	33	29	2	64	100%

The above table shows in single vessel disease 3 of them were normal individuals. In double vessel disease 4 individuals were mildly depressed, 6 were normal. In triple vessel disease 25 patients were found to have mild depression, 2 patients were moderately depressed and 24 individuals were found to be normal.

Figure 28: Association of coronary angiogram and severity of depression in surgical management group



In single vessel disease 5 % were normal. In double vessel disease 6% were mildly depressed and normal patients were around 9%. In triple vessel disease 39% had mild depression, 3% were moderately depressed and 38% were normal individuals. When compared between these variables the p value is around 0.435 which is not statistically significant.

DISCUSSION

Depression following myocardial infarction is common. Both the diseases, depression and myocardial infarction are the leading cause of disability all over the world. Myocardial infarction following depression plays an important role in predicting the quality of life, good treatment adherence and the risk of mortality of the patients.

In this study we considered patients who had myocardial infarction and grouped them according to the various treatment received for their myocardial infarction such as medical management, angioplasty and surgical management. We recruited patients who suffered myocardial infarction after one month to within one year of their follow up who attended the cardiology outpatient department. This includes patients who met the inclusion criteria.

Each patient is assessed for the prevalence of depression by administering the Hamilton depression rating scale, a 24 item version. A total of 183 myocardial infarction patients completed the study and they were divided into three groups depending on the kind of treatment received for the myocardial infarction. Angioplasty group had 50 patients, medical management group had 69 patients and surgical management group had 64 patients completed the study.

The socio demographic variables in all the three groups were comparable. These includes age, gender, socio economic status and education status. Further, variables like hypertension, diabetes mellitus, left ventricular dysfunction, coronary angiogram, dyslipidemia and smoking history were also compared within the three groups. Severity of depression was assessed from the Hamilton depression rating scale 24 item version based on their scores. Score below 7 is considered as normal;

score from 8 to 17 is considered as mild depression; score from 18 to 24 is considered as moderate depression; score more than 25 is considered as a severe depression.

In the total study population 151 males and 32 females participated in the study. In males the highest proportion is seen in the age group between 41 to 60 years of age which is 81 patients. This is followed by 53 males in the age group between 61 to 80 years. The total female population of 32 patients. In that, highest number is seen in the age group between 61 to 80 years and followed by 14 female patients in the age group between 41 to 60 years.

Prevalence of depression in the total study population:

In our study population total of 88 patients received a diagnosis of depression out of 183 total patients which is contributing around 48%. The remaining 52 % (95 patients) were noted to be normal.

Prevalence of depression in the three study groups:

The highest number of depression is seen in 51% of the patients who received medical management followed by 48% in surgical management group and 44 % in angioplasty group. Patients who did not received a diagnosis of depression is seen in 56% angioplasty group followed by 52% in surgical management and 49% in medical management. There is no significant difference in P value when compared between normal and depressed patients in the three study population group.

Thombs BD et al have reported the prevalence of depression of around 16 to 45 %. In the Indian population Agarwal et al have reported the prevalence of depression in post myocardial infarction was around 24%.

The prevalence rates were high in our study when compared with the other studies done in India and in some other population.

Prevalence of severity of depression in the three study groups:

Mild depression is seen in 82 patients which contributes around 45% and the remaining 52% were contributed by the normal patients and finally 2% of moderate depression is seen in the three study groups.

The mild depression is found to be high in the medical management study group of 46 % and followed by 45% in the surgical management group and 42 % were seen in angioplasty group.

The moderate depression is seen in 4% in angioplasty group and 3% in surgical management group and 2% in medical management group.

The normal individuals is seen highest in angioplasty group of 56% and 52% in surgical management and finally the least number of normal patients is seen in the medical management group which contributes around 49%.

There is no significant difference between the severity of depression in the three study groups but significant increase in percentage of mild depression noted in the medical management group.

Depression seen high in the medical management group patients and in the HAMD scale patients reported of somatic complaints like decreased appetite, fatigability, anhedonia, heaviness in the back, anxiety symptoms more of psychological like headache, palpitation and early insomnia.

One of the strength in our study is that assessment of severity of depression in all the three groups and also the prevalence of depression in all the three groups based on their management which has not done in studies in the past in Indian population and others.

HAM D depression rating scale scores among three study groups:

The mean of HAM D scores were high in moderate depression in all the three study groups and all the moderate depression in the three study groups were statistically significant. The highest number of mean value of moderate depression is seen in the surgical management group of 21 and mean of 19 in medical and surgical management group.

All these results of prevalence of depression in all the three groups in total and the severity of depression suggests depression screening in the post myocardial infarction should be done in the myocardial infarction patients to improve the psychiatric care, good treatment adherence and also to reduce the cardiac mortality and to improve the quality of life.

Lichtman JH, reported saying, 2008 AHA Science Advisory concluded depression is seen among the coronary heart disease patients which leads to increased mortality and morbidity and so screening tests should be done for the early assessment and intervention for depression so as to improve the quality of life along with the better outcome.

Comparative analysis of socio demographic co-variables and their association with depression between three groups:

Age and the severity of depression in three groups:

Mild depression seen high in between the age group 41 to 60 years in all the three groups with highest percentage of 28% in surgical management, 26% in medical management and 24% in angioplasty group.

Moderate depression is seen high in surgical management group in the age group between 61 to 80 years with 3% followed by 2% in angioplasty.

There is no statistical difference in the p value between these three groups.

Middle aged groups highly contributes for depression in all the three study groups. Screening for depression in post myocardial infarction patients should be done mainly and to give more preferences for the age group 41 to 60 years.

Association of gender and severity of depression in three study groups:

Mild depression is seen high in the surgical management group in males of 41%, secondly in angioplasty group of around 36% and 35 % in medical management in males.

In Females the mild depression is high in medical management of 12%, 6% in angioplasty and 5% in the surgical management group. Moderate depression is high in both the surgical management and medical management group and is around 3%. Males have contributed depression in all the three study groups and it is considered as a risk factor for depression in post myocardial infarction patients as our results suggested.

There is no statistical differences between these three groups in their genders with the severity of depression.

Marital status and the severity of depression:

Mild depression is seen high in married group with 46% in medical management group followed by 45% in surgical management group and 42% in angioplasty group.

Moderate depression is seen in married group in medical management group of 4 % and 3% in surgical management group and 2% is seen in angioplasty group. There is no statistical difference between the marital status and severity of depression in all the three groups. Psycho social stressors could have contributed for depression in the married people which our results suggests high percentage of depression in all the three study groups.

Comparative analysis of other co-variables and their association with depression between three groups:

The other co variables include Diabetes mellitus, Hypertension, Dyslipidemia, Smoking, Left ventricular function, Coronary angiogram.

Diabetes mellitus and severity of depression in three groups:

Mild depression is seen in 30 % of medical management group followed by 22% in surgical management group and 18 % in angioplasty group. Moderate depression is seen high in medical management group of 3%. There is a statistical significant difference in the variable of presence of diabetes mellitus in the medical management group of P value of **0.041**.

Sushil and Vyas (1990) et al have reported 44 % of depression in the diabetes mellitus patients. In our study 75% of patients with diabetes mellitus as comorbidity in myocardial infarction patients had depression. Main contributing factor in the

HAM D depression rating scale which patients scores more on the insomnia due to polydipsia as an aggravating factor for the sleep disturbance in the midnight and the possible uncontrolled diabetes mellitus status and poor life style modification along with poor compliance of the medication. Several studies suggests depression as a contributing factor for poor diet regimen followed by the diabetes mellitus patients. Diabetes mellitus seems to be an important risk factor for developing mild and moderate depression.

Considering the results more attention should be given in diabetes mellitus and post myocardial infarction patients especially in the medical management group patients and treating the depression early and to improve the quality of psychiatric and medical care of the patients.

Hypertension and severity of depression in three groups:

Highest number of mild depression is seen in 28% of surgical management group and next is seen in 26% of medical management group and 16% in angioplasty group. Moderate depression is seen high in 3% of surgical management group. There is no statistical differences in p values between hypertension and the severity of depression in the three study groups. Hypertension is contributing depression in all the three study groups and it will be associated with possible stressful events. There could be a possible chance of developing depression in the hypertensive patients because of the usage of beta blockers by the patients.

Lianne Ringoir et al has reported in his study results saying that patients on lipophilic beta blockers likely to have more depression than on patients who were on non-lipophilic beta blockers. Several studies have reported that hypertension was

associated with personality traits like introvert, emotionally unstable patients and low frustration tolerance.

So careful psychiatric evaluation may be useful and possible psychotherapy would have benefit the patients by controlling his anger which contributes for hypertension and to maintain the blood pressure levels in turn it would have help the patients to improve his compliance for depression and to treat the depression as early as possible.

Dyslipidemia and severity of depression in three study groups:

In the association between dyslipidemia and severity of depression the mild depression is seen high in medical management group of 28%, 26% in angioplasty group and 20% in surgical management group. Moderate depression is high in 3% of medical management. There is no statistical differences in p values between the three groups. In our results suggests association between dyslipidemia and depression in myocardial infarction patients. Depression should be treated early in dyslipidemia patients if untreated the depressive symptoms will worsen and it finally contributes poor diet management and cholesterol levels will rise and it contributes for recurrent myocardial infarction.

Smoking history in the past and severity of depression in three groups:

Mild depression is seen high in the medical management group of 28%, surgical management group of 20% and angioplasty group of 18%. Moderate depression is seen high in 3% of medical management group. There is no statistical significance in p values between the past smoking history and the severity of depression in three study groups.

Depression is mainly seen in the surgical management patients and smoking is considered to be important risk factor for coronary artery disease also with depression as our results suggests and during the depressive episodes patients tend to smoke more and they will have sleep disturbance which leads to increase the severity of depression and finally causes cardiac mortality and death.

Left ventricular function and severity of depression in three groups:

Mild depression is seen high in mild left ventricular dysfunction in surgical management group of 26%. Moderate depression is seen high in mild left ventricular function in surgical management group of 9%. In the normal left ventricular function mild depression is seen high in angioplasty group of 20%. In the moderate left ventricular function, mild depression is seen high in medical management group of 14%. There is no statistical difference in p value between the left ventricular function and severity of depression in three study groups.

Coronary angiogram and severity of depression in three study groups:

Mild depression is seen high in single vessel disease of medical management group of 41% and second high is seen in triple vessel disease in surgical management group of 39%. Moderate depression is in high in single vessel disease in medical management group of 4%. There is no statistical differences in p value between these variables in the three study groups.

The percentage of depression in all the three study groups is high and our major strength of the study is that we have correlated socio demographic variables and other variables like hypertension, diabetes mellitus, coronary angiogram and left ventricular function with depression in all myocardial infarction study groups.

In all the variables there is a high percentage of depression including mild and moderate depression but there is no statistical significance. There is no study in Indian population was done with socio demographic variables and variables like cardiac risk factors and prevalence of depression in myocardial infarction based on their management .

Future studies would help to explore in this area and some other areas like cardiac and diabetic medications and the relationship with depression in myocardial infarction patients for the betterment of patient wellbeing and the quality of care and to reduce the cardiac mortality.

Considering the results very little attention has been given to depression in patients with myocardial infarction. Evidence suggests that people with myocardial infarction should be screened for depression and to start antidepressants early and cognitive behaviour therapy can be done for mild depression patients as suggested by the nice guidelines and it can improve their overall wellbeing, quality of life and interpersonal relationships.

LIMITATIONS

In this study we have certain limitations. Sample size in each group is different and less in angioplasty group is one of the limitation of the study. Convenient sampling is another bias as there is a chance of missing patients with more severe depression in the sample. Female gender is less when compared to male population in our study is one of our limitations. Inclusion of healthy volunteers as control group would have provided a comparison between the depression following myocardial infarction and the depression without the cardiac events. Medication details of hypertension patients receiving beta blockers were not included in the study that would have contributed for the depression in the study groups. Also the results cannot be generalized to the whole population as the study sample includes only the hospital based sample. Rating scale were administered by the principle investigator as an observer rating that would have biased the results would be one of the limitation in the study. Being a cross sectional study, the cause and effect relationship between depression and myocardial infarction cannot be assessed.

CONCLUSION

In this study we wanted to highlight that there is an increased prevalence rate of depression in the post myocardial infarction in the study groups when compared with the previous studies done in the Indian population. The higher percentage of depression is seen in the myocardial infarction patients who received medical management in the study group but there is no statistical difference in prevalence of depression among the three study groups. When compared between the three study groups based on their severity of depression, mild and moderate depression is seen high in the medical management group.

It is important to address the depression in the post myocardial infarction patients within one year as the risk is high can be remained high for more than five years after the myocardial infarction and increases the suicide risk. It is important to address the depression in post myocardial infarction by screening as reported in the previous studies. We can also prevent the cardiac mortality and also can improve the quality of life, educating the life style modification, improving the good treatment adherence and better outcome of the patient and preventing the progression of depression from milder to severe ones.

Even though the past decade has made attempts to address this issue of depression in the post myocardial infarction, more attention is required in this area to further improve the overall treatment outcome. Further studies should focus on myocardial infarction based on their treatment received to improve the treatment outcome of the depressed patients.

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ANNEXURE

PATIENT PROFORMA

Date				
OP No.				
Name				
Age				
Sex				
Marital Status	Single Separated	Married Widow		
Education	No formal education Primary	Higher school Graduated		
Occupation				
Socio Economic Status	High	Middle	Low	
Cardiac Diagnosis				
	Medical Management	Angioplasty	Surgical Management	
<u>Cardiac History :</u> 1. Previous H/o IHD	Yes		No	
2. Left Ventricular Function	Normal Severe	Mild	Moderate	
3. Dyslipidemia	Yes		No	
4. Newyork Heart Association Functional Classification	Before		After	
5. Coronary Angiogram done	Single vessel Disease	Double vessel disease	Triple vessel disease	LMCA

<u>Smoking history:</u>	Yes	No
Present history	Duration: Amount	
Past history	Duration: Amount	Yes No
Medical Co-Morbidities		
Hypertension	Yes	No
Medication		
Diabetes mellitus	Yes	No
HAMD Score		

HAMILTON DEPRESSION RATING SCALE

For each item select the “cue” which best characterizes the patient.

1. DEPRESSED MOOD (Sadness, hopeless, helpless, worthless)

- 0= Absent
- 1= These feeling states indicated only on questioning
- 2= These feeling states spontaneously reported verbally
- 3= Communicates feeling states non-verbally—i.e., through facial expression, posture, voice, and tendency to weep
- 4= Patient reports VIRTUALLY ONLY these feeling states in his spontaneous verbal and non-verbal communication

2. FEELINGS OF GUILT

- 0= Absent
- 1= Self reproach, feels he has let people down
- 2= Ideas of guilt or rumination over past errors or sinful deeds
- 3= Present illness is a punishment. Delusions of guilt
- 4= Hears accusatory or denunciatory voices and/or experiences threatening visual hallucinations

3. SUICIDE

- 0= Absent
- 1= Feels life is not worth living
- 2= Wishes he were dead or any thoughts of possible death to self
- 3= Suicidal ideas or gesture
- 4= Attempts at suicide (any serious attempt rates 4)

4. INSOMNIA EARLY

- 0= No difficulty falling asleep
- 1= Complains of occasional difficulty falling asleep—i.e., more than 1/2 hour
- 2= Complains of nightly difficulty falling asleep

5. INSOMNIA MIDDLE

- 0= No difficulty
- 1= Patient complains of being restless and disturbed during the night
- 2= Waking during the night—any getting out of bed rates 2 (except for purposes of voiding)

6. INSOMNIA LATE

- 0= No difficulty
- 1= Waking in early hours of the morning but goes back to sleep
- 2= Unable to fall asleep again if he gets out of bed

7. WORK AND ACTIVITIES

- 0= No difficulty
- 1= Thoughts and feelings of incapacity, fatigue or weakness related to activities; work or hobbies
- 2= Loss of interest in activity; hobbies or work—either directly reported by patient, or indirect in listlessness, indecision and vacillation (feels he has to push self to work or activities)
- 3= Decrease in actual time spent in activities or decrease in productivity
- 4= Stopped working because of present illness

8. RETARDATION: PSYCHOMOTOR (Slowness of thought and speech; impaired ability to concentrate; decreased motor activity)

- 0= Normal speech and thought
- 1= Slight retardation at interview
- 2= Obvious retardation at interview
- 3= Interview difficult
- 4= Complete stupor

9. AGITATION

- 0= None
- 1= Fidgetiness
- 2= Playing with hands, hair, etc.
- 3= Moving about, can't sit still
- 4= Hand wringing, nail biting, hair-pulling, biting of lips

10. ANXIETY (PSYCHOLOGICAL)

- 0= No difficulty
- 1= Subjective tension and irritability
- 2= Worrying about minor matters
- 3= Apprehensive attitude apparent in face or speech
- 4= Fears expressed without questioning

11. ANXIETY SOMATIC: Physiological concomitants of anxiety, (i.e., effects of autonomic over activity, “butterflies,” indigestion, stomach cramps, belching, diarrhea, palpitations, hyperventilation, paresthesia, sweating, flushing, tremor, headache, urinary frequency). Avoid asking about possible medication side effects (i.e., dry mouth, constipation)

- 0= Absent
- 1= Mild
- 2= Moderate
- 3= Severe
- 4= Incapacitating

12. SOMATIC SYMPTOMS (GASTROINTESTINAL)

0= None

1= Loss of appetite but eating without encouragement from others. Food intake about normal

2= Difficulty eating without urging from others. Marked reduction of appetite and food intake

13. SOMATIC SYMPTOMS GENERAL

0= None

1= Heaviness in limbs, back or head. Backaches, headache, muscle aches. Loss of energy and fatigability

2= Any clear-cut symptom rates 2

14. GENITAL SYMPTOMS (Symptoms such as: loss of libido; impaired sexual performance; menstrual disturbances)

0= Absent

1= Mild

2= Severe

15. HYPOCHONDRIASIS

0= Not present

1= Self-absorption (bodily)

2= Preoccupation with health

3= Frequent complaints, requests for help, etc.

4= Hypochondriacal delusions

16. LOSS OF WEIGHT

A. When rating by history:

0= No weight loss

1= Probably weight loss associated with present illness

2= Definite (according to patient) weight loss

3= Not assessed

17. INSIGHT

0= Acknowledges being depressed and ill

1= Acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, etc.

2= Denies being ill at all

18. DIURNAL VARIATION

- A.** Note whether symptoms are worse in morning or evening. If NO diurnal variation, mark none
- 0= No variation
 - 1= Worse in A.M.
 - 2= Worse in P.M.
- B.** When present, mark the severity of the variation. Mark "None" if NO variation
- 0= None
 - 1= Mild
 - 2= Severe

19. DEPERSONALIZATION AND DEREALIZATION (Such as: Feelings of unreality; Nihilistic ideas)

- 0= Absent
- 1= Mild
- 2= Moderate
- 3= Severe
- 4= Incapacitating

20. PARANOID SYMPTOMS

- 0= None
- 1= Suspicious
- 2= Ideas of reference
- 3= Delusions of reference and persecution

21. OBSESSIVE AND COMPULSIVE SYMPTOMS

- 0= Absent
- 1= Mild
- 2= Severe

22. HELPLESSNESS

- 0= Not present
- 1= Subjective feelings which are elicited only by inquiry
- 2= Patient volunteers his helpless feelings
- 3= Requires using, guidance and reassurance to accomplish ward chores or personal hygiene
- 4= Requires physical assistance for dress, grooming, eating, bedside tasks, or personal hygiene

23. HOPELESSNESS

0= Not present

1= Immediately doubts that “things will improve” but can be reassured

2= Consistently feels “hopeless” but accepts reassurances.

3= Expresses feelings of discouragement, despair, pessimism about future, which cannot be dispelled.

4= Spontaneously and inappropriately perseverates “I’ll never get well” or its equivalent

24. Worthlessness (Ranges from mild loss of esteem, feelings of inferiority, self-depreciation to delusional notions of worthlessness)

0= Not present

1= Indicates feeling of worthlessness (loss of self-esteem) only on questioning

2= Spontaneously indicates feelings of worthlessness (loss of self-esteem)

3= Different from 2 by degree. Patient volunteers that he is “no good,” “inferior,” etc.,

4= Delusional notions of worthlessness-ie, “I am a heap of garbage” or its equivalent

Total score

**PSG Institute of Medical Science and Research, Coimbatore
Institutional Human Ethics Committee
INFORMED CONSENT FORMAT FOR RESEARCH PROJECTS**

(strike off items that are not applicable)

I, Dr. S. NAVEEN KUMAR am carrying out a study on the topic: Prevalence of depression among post myocardial infarction patients attending cardiology outpatient department. as part of my / our research project being carried out under the aegis of the Department of: CARDIOLOGY

(Applicable to students only): My / our research guide is: Dr. I. ANAND

The justification for this study is:

The objectives of this study are:

Primary Objective: To study the prevalence of depression among post myocardial infarction patients

Secondary Objective: To do comparative analysis of prevalence of depression among patients who had received medical management, angioplasty, surgical management patients.

To study the relationship between the effect on smoking and depression.

Sample size: 80 per group. Total 240

Study volunteers / participants are (specify population group & age group): 18- 65 years.

Location: PSGIMSR

We request you to kindly cooperate with us in this study. We propose collect background information and other relevant details related to this study. We will be carrying out:

Initial interview (specify approximate duration): 20-30 minutes.

Data collected will be stored for a period of fifteen years. We will / will not use the data as part of another study.

Health education sessions: Number of sessions: _____. Approximate **duration** of each session:

_____ minutes.

Clinical examination (Specify details and purpose):

Blood sample collection: Specify quantity of blood being drawn: _____ ml.

No. of times it will be collected: _____.

Whether blood sample collection is part of routine procedure or for research (study) purpose:

1. Routine procedure
2. Research purpose

Specify **purpose**, discomfort likely to be felt and side effects, if any:

Whether blood sample collected will be stored after study period: Yes / No, it will be destroyed

Whether blood sample collected will be sold: Yes / No

Whether blood sample collected will be shared with persons from another institution: Yes / No

Medication given, if any, duration, side effects, purpose, benefits:

Whether medication given is part of routine procedure: Yes / No (If not, state reasons for giving this medication)

Whether alternatives are available for medication given: Yes / No (If not, state reasons for giving this particular medication)

Final interview (specify approximate duration): _____ mts. If **photograph** is taken, purpose:

Benefits from this study: Myocardial infarction patients who were found to have depression from this study will be given advice regarding the illness and treatment strategies available in the department of psychiatry in PSG IMSR.

Risks involved by participating in this study:

How the **results** will be used:

If you are uncomfortable in answering any of our questions during the course of the interview / biological sample collection, **you have the right to withdraw from the interview / study at anytime**. You have the freedom to withdraw from the study at any point of time. Kindly be assured that your refusal to participate or withdrawal at any stage, if you so decide, will not result in any form of compromise or discrimination in the services offered nor would it attract any penalty. You will continue to have access to the regular services offered to a patient. You will **NOT** be paid any remuneration for the time you spend with us for this interview / study. The information provided by you will be kept in strict confidence. Under no circumstances shall we reveal the identity of the respondent or their families to anyone. The information that we collect shall be used for approved research purposes only. You will be informed about any significant new findings- including adverse events, if any, – whether directly related to you or to other participants of this study, developed during the course of this research which may relate to your willingness to continue participation.

Consent: The above information regarding the study, has been read by me/ read to me, and has been explained to me by the investigator/s. Having understood the same, I hereby give my consent to them to interview me. I am affixing my signature / left thumb impression to indicate my consent and willingness to participate in this study (i.e., willingly abide by the project requirements).

Signature / Left thumb impression of the Study Volunteer / Legal Representative:

Signature of the Interviewer with date:

Witness:

Contact number of PI:

Contact number of Ethics Committee Office: 0422 2570170 Extn.: 5818

ஒப்புதல் படிவம்

தேதி:

டாக்டர். செ. நவீன்குமார். ஆகிய நான். பி.எஸ்.ஜி மருத்துவக் கல்லூரியின் இருதய நோய்த் துறையின் கீழ் இதய நோய் வெளி நோயாளிப் பிரிவுக்கு வரும் மாரடைப்பு நோயினால் பாதிக்கப்பட்டவர்களிடம் மன அழுத்த பாதிப்பை கண்டறிதல் என்ற தலைப்பில் ஆய்வு மேற்கொள்ள உள்ளேன்.

ஏன் ஆய்வு வழிகாட்டி : டாக்டர். ஐ. ஆனந்த். பேராசிரியர்

ஆய்வு மேற்கொள்வதற்கான அடிப்படை :

மாரடைப்பு நோயாளிகளில் மன அழுத்தம் வெகுவாக காணப்படுகின்றன. ஆகையால் இந்த ஆய்வின் மூலம் மன அழுத்தத்தின் பாதிப்பை அறிந்து கொள்ள இருக்கிறேன்.

ஆய்வின் நோக்கம் :

1. மாரடைப்பு நோயினால் பாதிக்கப்பட்டவர்களிடம் மன அழுத்த நோயை கண்டறிதல். அதன் மூலம் மாரடைப்பு நோயாளிகளுள் காணப்படும் வேறுபாடுகளை அலசுதல்
- 2 புகைப்பிடித்தல் மற்றும் மனஅழுத்தத்தின் தொடர்பை அலசுதல்.

ஆய்வு மேற்கொள்ளும் இடம் :

பி.எஸ்.ஜி மருத்துவமனை. கோயம்புத்தூர்

ஆய்வின் பலன்கள் :

மாரடைப்பு நோயாளிகளில் மன அழுத்தத்தை கண்டறிய வாய்ப்பாக அமையும். மன அழுத்தம் கண்டறியப்படும் நோயாளிகளுக்கு அந்நோயின் விவரம் மற்றும் சிகிச்சை முறைகள் தெரிவிக்கப்படும். அவர்கள் பி.எஸ்.ஜி மருத்துவமனையில் உள்ள மனநலப் பிரிவில் சிகிச்சை மேற்கொள்ள வாய்ப்பாக அமையும்.

இந்த ஆய்வில் கிடைக்கும் தகவல்கள்5..... வருடங்கள் பாதுகாக்கப்படும். ஈவை வேறு எந்த ஆய்விற்கும் பயன்னடுத்தப்பட மாட்டாது. எந்த நிலையிலும் உங்களைப் பற்றிய தகவல்கள் யாருக்கும் தெரிவிக்கப்பட மாட்டாது. அவை இரகசியமாக வைக்கப்படும்..

இந்த ஆய்வில் பங்கேற்க ஒப்புக்கொள்ளுவதால் எந்த விதமான பலனும் உங்களுக்கு கிடைக்காது. எந்த நேரத்தில் வேண்டுமானாலும் ஆய்விலிருந்து விலகிக்கொள்ளும் உரிமை உங்களுக்கு உண்டு.

ஆய்விலிருந்து விலகிக்கொள்வதால் உங்களுக்கு அளிக்கப்படும் சிகிச்சையில் எந்த வித மாற்றமும் இருக்காது.

இந்த ஆராய்ச்சிக்காக உங்களிடம் சில கேள்விகள் கேட்கப்படும். மேலும் இந்த ஆய்வில் பங்கு கொள்வது உங்கள் சொந்த விருப்பம். இதில் எந்த விதக் கட்டாயமும் இல்லை. நீங்கள் விருப்பப்பட்டால் இந்த ஆய்வின் முடிவுகள் உங்களுக்குத் தெரியப்படுத்தப்படும்.

ஆய்வாளரின் கையொப்பம் :

தேதி :

ஆய்வுக்குட்படுவரின் ஒப்புதல் :

நான் இந்த ஆராய்ச்சியின் நோக்கம் மற்றும் அதன் பயன்பாட்டினைப் பற்றி தெளிவாகவும். விளக்கமாகவும் தெரியப்படுத்தப்பட்டுள்ளேன். இந்த ஆராய்ச்சியில் பங்கு கொள்ளவும். இந்த ஆராய்ச்சியின் மருத்துவ ரீதியான குறிப்புகளை வரும் காலத்திலும் உபயோகப்படத்திக் கொள்ளவும் முழு மனதுடன் சம்மதிக்கிறேன்.

ஆய்வுக்குட்படுவரின் பெயர். முகவரி :

கையொப்பம் :

தேதி :

ஆய்வாளரின் தொலைபேசி எண் : 9952428672

மனித நெறிமுறைக் குழுவின் தொலைபேசி எண் : 0422 2570170 Extn: 5818

ANGIOPLASTY

S.No	Age	Sex	Marital status	Education	SES	LV Function	Dyslipidemia	Coronary angiogram	Smoking history-present	Smoking history - past	Smokin-duration	Smoking - amount	Hypertension	Diabetes mellitus	HAM D	Severity
1	73	F	Married	Primary	Low	Normal	No	Single	no	no			yes	no	7	normal
2	62	m	married	Graduated	Middle	Normal	yes	Single	no	no			yes	yes	6	normal
3	78	m	Married	higher school	Middle	Normal	yes	triple	no	no			yes	no	0	normal
4	43	m	Married	Primary	Low	mild	yes	triple	no	yes	20 years	1 pack	yes	yes	11	mild
5	62	m	Married	Primary	Low	Normal	No	Single	no	yes	20 years	10 beedi	no	no	5	normal
6	52	m	Married	higher school	Low	Normal	No	double	no	yes	20 years	20 cig	no	yes	10	mild
7	53	m	Married	Primary	Low	moderate	yes	Single	no	yes	20 years	1 pack	yes	yes	7	normal
8	46	m	Married	no formal education	Low	mild	yes	Single	no	yes	25 years	1 pack	no	no	1	normal
9	63	m	Married	Primary	Middle	Normal	yes	Single	no	no			yes	yes	4	normal
10	61	f	widow	Primary	Middle	Normal	yes	Single	no	no			yes	no	2	normal
11	54	m	Married	no formal education	Low	Normal	No	Single	no	no			no	no	6	normal
12	30	m	Married	Primary	Low	moderate	yes	Single	no	yes	10 years	1 pack	no	no	2	normal
13	55	m	Married	Graduated	Middle	Normal	No	double	no	yes	1 year	1 cig	no	yes	2	normal
14	43	m	Married	Primary	Low	mild	yes	Single	no	no			no	no	10	mild
15	45	m	Married	Primary	Middle	mild	yes	double	no	no			yes	yes	6	normal
16	40	m	Married	higher school	Low	severe	yes	Single	no	yes	20 years	1 cig	no	yes	2	normal
17	81	m	Married	Primary	Middle	moderate	yes	Single	no	no			yes	no	3	normal
18	58	m	Married	Primary	Middle	Normal	No	Single	no	no			yes	no	9	mild
19	61	m	Married	Primary	Low	Normal	yes	Single	no	yes	20 years	1 pack	no	no	7	normal
20	51	m	Married	Primary	Middle	Normal	yes	Single	no	yes	20 years	3 cig	yes	no	7	normal
21	40	m	Married	no formal education	Low	Normal	yes	double	no	no			no	no	8	mild
22	37	m	Married	higher school	Low	Normal	No	double	no	yes	23 years	1 pack	no	yes	14	mild
23	56	m	Married	no formal education	Low	Normal	No	Single	no	yes	40 years	1 pack	yes	no	8	mild
24	66	m	Married	higher school	Middle	mild	No	double	no	yes	20 years	1 pack	yes	no	19	moderate
25	54	m	Married	Primary	Low	Normal	No	Single	no	no			no	no	4	normal
26	77	m	Married	no formal education	Middle	mild	yes	triple	no	no			yes	no	13	mild
27	58	m	Married	higher school	Low	moderate	No	Single	no	no			no	yes	8	mild

28	66	f	Married	higher school	Low	severe	yes	Single	no	no			no	no	8	mild
29	48	f	Married	Primary	Middle	Normal	yes	double	no	no			no	no	7	normal
30	52	m	Married	no formal education	Middle	moderate	No	double	no	yes	20 years	2 pack	no	no	7	normal
31	51	m	Married	higher school	Middle	mild	No	double	no	no			no	yes	12	mild
32	56	m	Married	higher school	Middle	Normal	No	double	no	yes	20 years	1 pack	no	no	9	mild
33	62	m	Married	higher school	Middle	Normal	No	Single	no	no			no	yes	10	mild
34	61	f	Married	Primary	Low	mild	yes	double	no	no			yes	yes	9	mild
35	62	m	Married	Primary	Low	mild	No	Single	no	no			no	no	7	normal
36	61	m	Married	Primary	Middle	Normal	No	Single	no	no			yes	yes	5	normal
37	50	m	Married	higher school	Middle	Normal	yes	Single	no	yes	25 years	1 pack	yes	yes	14	mild
38	51	m	Married	Primary	Low	Normal	No	double	no	no			no	yes	7	normal
39	62	m	Married	Primary	Low	Normal	No	double	no	no			no	no	4	normal
40	60	m	Married	Primary	Low	Normal	yes	double	no	yes	40 years	1 pack beedi	yes	no	6	normal
41	39	m	Married	Primary	Low	moderate	No	Single	no	yes	15 years	1 pack	no	no	11	mild
42	60	m	Married	no formal education	Low	Normal	yes	double	no	yes	40 years	1 pack	yes	no	7	normal
43	57	m	Married	Primary	Middle	Normal	No	Single	no	no			no	yes	8	mild
44	60	m	Married	Primary	Low	severe	yes	triple	no	yes	35 years	1 pack	yes	no	9	mild
45	68	f	Married	Primary	Low	mild	yes	Single	no	no			no	no	8	mild
46	43	m	Married	higher school	Middle	Normal	No	double	no	yes	20 years	1 pack	no	yes	7	normal
47	54	m	Married	higher school	Middle	Normal	No	double	no	yes	35 years	1 pack	no	no	8	mild
48	40	m	Married	higher school	Low	moderate	No	double	no	yes	20 years	1 pack	yes	no	10	mild
49	65	f	Married	higher school	Middle	mild	No	Single	no	no			no	no	4	normal
50	72	f	Married	higher school	Middle	mild	No	Single	no	no			yes	no	7	normal

MEDICAL MANAGEMENT

S.No	Age	Sex	Marital status	Education	SES	LV Function	Dyslipidemia	Coronary angiogram	Smoking history-present	Smoking history-past	Smoking - duration	Smoking - amount	Hypertension	Diabetes mellitus	HAMD	Severity
1	79	m	married	primary	middle	normal	no	single	no	no			no	no	3	normal
2	65	m	married	higher school	middle	severe	no	single	no	no			yes	no	9	mild
3	36	m	married	primary	low	normal	yes	single	no	yes	15 years	1 pack	no	no	7	normal
4	48	m	married	no formal education	low	normal	yes	single	no	yes	25 years	1 pack	yes	yes	5	normal
5	62	m	married	primary	low	mild	no	single	no	no			no	no	7	normal
6	52	m	married	primary	low	mild	no	single	no	yes	25 years	1 pack	yes	yes	10	mild
7	62	m	married	primary	low	mild	no	single	no	no			no	no	10	mild
8	50	m	married	primary	low	mild	yes	single	no	no			no	yes	10	mild
9	50	m	married	primary	low	normal	yes	single	no	yes	20 years	1 pack	no	yes	10	mild
10	64	m	married	primary	low	moderate	yes	single	no	no			yes	yes	11	mild
11	55	m	married	primary	low	moderate	yes	triple	no	no			no	no	13	mild
12	45	m	married	higher school	middle	mild	yes	single	no	no			yes	yes	6	normal
13	36	m	married	higher school	low	moderate	no	single	no	no			no	no	8	mild
14	52	f	married	primary	middle	mild	yes	double	no	no			yes	yes	12	mild
15	61	m	married	primary	low	normal	yes	single	no	yes	20 years	1 pack	yes	yes	8	mild
16	80	m	married	primary	middle	mild	yes	single	no	no			yes	yes	17	mild
17	50	f	married	no formal education	middle	moderate	yes	single	no	no			yes	yes	17	mild
18	68	m	married	higher school	middle	mild	no	single	no	no			yes	yes	8	mild

19	61	m	married	no formal education	low	normal	yes	single	no	no			yes	no	19	moderate
20	76	m	married	graduated	middle	moderate	yes	single	no	no			yes	no	8	mild
21	58	m	married	no formal education	low	mild	no	single	no	yes	20 years	1 pack	no	yes	7	normal
22	61	f	married	higher school	low	moderate	no	single	no	no			no	yes	3	normal
23	55	m	married	higher school	low	moderate	yes	single	no	no			yes	yes	13	mild
24	75	m	married	no formal education	middle	mild	yes	single	no	yes	20 years	1 pack	no	no	5	normal
25	79	m	married	higher school	low	mild	yes	single	no	no			yes	yes	2	normal
26	59	m	married	primary	low	moderate	yes	double	no	yes	20 years	1 pack	no	no	5	normal
27	52	f	married	no formal education	low	normal	no	single	no	no			no	yes	20	moderate
28	68	m	married	primary	low	normal	no	single	no	yes	20 years	1 pack	no	no	7	normal
29	38	m	married	primary	middle	normal	yes	single	no	yes	22 years	1 pack	no	yes	19	moderate
30	48	m	married	no formal education	low	normal	no	single	no	yes	5 years	1 pack	no	no	13	mild
31	58	f	married	no formal education	middle	normal	no	single	no	no			no	no	10	mild
32	54	m	married	primary	middle	normal	yes	single	no	no			yes	no	7	normal
33	53	m	married	graduated	middle	mild	no	single	no	yes	23 years	1 pack	no	no	4	normal
34	66	m	married	higher school	middle	mild	yes	single	no	yes	30 years	1 pack	yes	no	3	normal
35	30	m	married	primary	low	normal	no	single	no	no			no	no	12	mild
36	56	m	married	graduated	middle	mild	yes	single	no	yes	22 years	1 pack	yes	yes	13	mild
37	51	m	married	higher school	low	mild	yes	single	no	no			yes	yes	10	mild

38	42	m	married	higher school	middle	normal	yes	single	no	no			yes	yes	3	normal
39	65	f	married	no formal education	middle	mild	yes	single	no	no			no	yes	9	mild
40	42	m	married	primary	low	mild	yes	triple	no	yes	28 years	1 pack	yes	no	9	mild
41	47	m	married	higher school	middle	moderate	yes	triple	no	no			yes	no	2	normal
42	50	f	married	no formal education	low	normal	yes	single	no	no			yes	yes	13	mild
43	61	f	widow	primary	middle	normal	yes	double	no	no			yes	yes	7	normal
44	62	m	married	graduated	middle	normal	no	single	no	no			yes	yes	2	normal
45	73	m	married	no formal education	middle	normal	yes	single	no	yes	50 years	1 pack	no	no	4	normal
46	58	f	married	no formal education	low	normal	no	single	no	no			no	yes	4	normal
47	60	f	married	primary	middle	mild	yes	single	no	no			no	yes	11	mild
48	60	m	married	higher school	middle	moderate	no	single	no	no			no	yes	8	mild
49	64	m	married	primary	middle	moderate	yes	single	no	no			yes	yes	13	mild
50	47	f	married	primary	middle	normal	yes	single	no	no			no	no	6	normal
51	56	f	married	primary	middle	moderate	no	single	no	no			yes	yes	8	mild
52	36	f	married	higher school	middle	normal	no	single	no	no			yes	no	3	normal
53	57	f	married	primary	middle	normal	no	double	no	no			yes	no	6	normal
54	77	m	married	primary	low	severe	yes	single	no	yes	25 years	1 pack	yes	no	8	mild
55	90	m	married	primary	middle	normal	no	single	no	no			yes	no	4	normal
56	75	m	married	primary	middle	normal	no	triple	no	no			no	yes	13	mild
57	53	m	married	primary	middle	normal	no	single	no	yes	24 years	1 pack	no	yes	10	mild

			d		e											
58	72	f	married	no formal education	middle	normal	no	single	no	no			yes	yes	5	normal
59	39	m	married	higher school	low	mild	yes	single	no	yes	20 years	1 pack	no	no	4	normal
60	62	m	married	higher school	middle	mild	no	single	no	no			no	no	4	normal
61	48	m	married	higher school	middle	mild	no	single	no	no			yes	yes	5	normal
62	52	m	married	primary	middle	moderate	no	single	no	yes	20 years	1 pack	no	yes	8	mild
63	66	f	married	no formal education	low	normal	no	double	no	no			yes	no	4	normal
64	55	m	married	no formal education	low	normal	no	single	no	no			no	no	6	normal
65	64	f	married	primary	low	normal	no	single	no	no			no	no	4	normal
66	85	m	married	primary	middle	severe	no	single	no	no			no	no	3	normal
67	55	f	married	no formal education	middle	moderate	no	single	no	no			yes	no	7	normal
68	77	f	married	no formal education	low	normal	no	single	no	no			yes	no	8	mild
69	44	f	married	no formal education	low	moderate	no	triple	no	no			yes	yes	5	normal

SURGICAL MANAGEMENT

S.No	Age	Sex	Marital status	Education	SES	LV Function	Dyslipidemia	Coronary angiogram	Smoking history-present	Smoking history - past	Smokin-duration	Smoking - amount	Hypertension	Diabetes mellitus	HAM D	Severity
1	65	f	married	no formal education	middle	normal	yes	triple	no	no			yes	no	10	mild
2	62	m	married	primary	low	normal	no	triple	no	no			no	yes	8	mild
3	67	f	married	primary	low	severe	no	triple	no	no			yes	no	8	mild
4	48	m	married	primary	low	normal	no	double	no	no			no	no	6	normal
5	45	f	married	no formal education	middle	normal	yes	triple	no	no			no	no	6	normal
6	60	m	married	higherschool	middle	normal	no	triple	no	yes	30 years	2 pack	yes	yes	12	mild
7	52	m	married	primary	low	normal	yes	triple	no	yes	20 years	1 pack	no	yes	5	normal
8	48	m	married	higherschool	middle	normal	no	triple	no	no			yes	no	6	normal
9	55	m	married	graduated	middle	normal	yes	triple	no	no			yes	no	7	normal
10	40	m	married	primary	low	normal	yes	double	no	yes	15 years	1 pack	yes	yes	8	mild
11	60	m	married	primary	low	mild	yes	triple	no	yes	20 years	1 pack	yes	yes	6	normal
12	62	m	married	higherschool	low	normal	no	double	no	no			no	no	5	normal
13	55	m	married	higherschool	low	normal	no	triple	no	no			no	yes	8	mild
14	55	m	married	primary	low	normal	no	single	no	yes	25 years	1 pack	yes	no	6	normal
15	66	m	married	higherschool	middle	mild	no	triple	no	no			no	yes	3	normal
16	48	m	married	higherschool	low	severe	no	triple	no	yes	20 years	1 pack	no	no	5	normal
17	56	m	married	higherschool	middle	normal	no	triple	no	yes	20 years	1 pack	no	yes	6	normal
18	52	m	married	primary	middle	moderate	yes	triple	no	no			yes	yes	6	normal
19	48	m	married	graduated	middle	moderate	yes	triple	no	yes	20 years	1 pack	yes	yes	0	normal
20	75	m	married	no formal education	low	severe	yes	triple	no	yes	40 years	25 beedi	yes	yes	7	normal
21	40	m	married	graduated	middle	normal	yes	triple	no	yes	20 years	10 cig	yes	yes	1	normal
22	72	m	married	graduated	middle	normal	yes	triple	no	yes	10 years	1 pack	yes	yes	7	normal
23	52	m	married	primary	low	severe	yes	triple	no	no			no	no	8	mild
24	65	m	married	no formal education	low	normal	no	triple	no	yes	20 years	1 pack	yes	yes	16	mild
25	41	m	married	higherschool	middle	normal	yes	triple	no	yes	5 years	1 pack	no	yes	7	normal
26	46	m	married	graduated	middle	normal	yes	triple	no	yes	3 years	3 cig	no	no	8	mild
27	65	m	married	higherschool	middle	normal	yes	triple	no	yes	20 years	1 pack	yes	yes	23	moderate
28	55	m	married	primary	low	mild	no	triple	no	yes	20 years	1 pack	no	yes	16	mild
29	34	m	married	higherschool	middle	normal	yes	triple	no	no			no	yes	4	normal

30	60	m	married	graduated	middle	normal	no	triple	no	no			no	yes	7	normal
31	65	m	married	primary	middle	normal	no	single	no	no			yes	yes	4	normal
32	59	m	married	higherschool	middle	normal	no	triple	no	no			yes	yes	13	mild
33	67	m	married	primary	middle	severe	yes	triple	no	no			yes	no	5	normal
34	60	m	married	higherschool	low	normal	no	double	no	no			yes	yes	4	normal
35	63	m	married	higherschool	middle	normal	yes	triple	no	no			yes	yes	0	normal
36	69	m	married	primary	low	normal	no	triple	no	no			yes	no	16	mild
37	66	f	married	no formal education	low	mild	yes	triple	no	no			yes	no	9	mild
38	66	m	married	primary	middle	moderate	yes	triple	no	no			yes	yes	5	normal
39	67	m	married	primary	middle	normal	no	triple	no	no			no	yes	9	mild
40	47	m	married	primary	middle	moderate	yes	triple	no	no			yes	no	12	mild
41	59	m	married	graduated	low	normal	no	triple	no	no			yes	yes	13	mild
42	70	m	married	no formal education	low	normal	no	triple	no	yes	10 years	1 pack	yes	no	20	moderate
43	44	m	married	primary	low	normal	no	triple	no	yes	10 years	2 cig	no	no	9	mild
44	55	m	married	no formal education	low	normal	no	triple	no	yes	20 years	1 pack	no	no	10	mild
45	55	m	married	higherschool	middle	normal	yes	triple	no	yes	25 years	1 pack	yes	yes	9	mild
46	67	m	married	no formal education	low	normal	yes	triple	no	yes	30 years	1 pack	yes	yes	5	normal
47	52	m	married	primary	low	mild	yes	triple	no	yes	10 years	1 pack	yes	yes	11	mild
48	70	m	married	no formal education	low	normal	no	triple	no	no			no	no	16	mild
49	70	m	married	no formal education	low	normal	yes	triple	no	yes	50 years	1 pack	no	no	6	normal
50	50	m	married	higherschool	low	normal	yes	double	no	yes	30 years	7 cig	yes	no	14	mild
51	43	m	married	higherschool	low	severe	no	triple	no	yes	10 years	2 pack	yes	yes	8	mild
52	64	m	married	higherschool	middle	normal	no	triple	no	yes	15 years	1 pack	yes	no	14	mild
53	61	m	married	higherschool	low	normal	no	double	no	no			yes	yes	3	normal
54	52	m	married	no formal education	low	normal	yes	double	no	no			no	no	9	mild
55	54	m	married	primary	low	normal	yes	double	yes	yes	40 years	3 pack	yes	yes	2	normal
56	42	m	married	primary	low	moderate	yes	triple	no	no			yes	yes	12	mild
57	48	m	married	primary	low	normal	yes	double	no	yes	20 years	1 pack	yes	no	8	mild
58	70	m	married	primary	middle	normal	yes	triple	no	yes	56 years	1 pack	no	no	8	mild

59	55	m	married	no formal education	low	mild	yes	single	no	yes	15 years	1 pack	yes	no	1	normal
60	64	m	married	higherschool	low	mild	yes	triple	no	no			yes	yes	5	normal
61	50	m	married	higherschool	middle	normal	yes	triple	no	no			no	yes	4	normal
62	67	f	married	no formal education	middle	normal	no	triple	no	no			yes	no	6	normal
63	54	m	married	primary	low	normal	no	triple	no	yes	30 years	1 pack	no	yes	1	normal
64	43	m	married	higherschool	low	normal	no	triple	no	no			yes	yes	9	mild