PROSPECTIVE ANALYSIS OF IMPACT OF PHARMCOTHERAPY ADHERENCE ON TREATMENT EFFECTIVENESS IN POST OPERATIVE HEART PATIENTS

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Abstract

Myocardial infarction is the irreversible damage of myocardial tissue caused by prolonged ischemia and hypoxia. This most commonly occurs when a coronary artery becomese blocked following the rupture of an atherosclerotic plaque, which then leads to the formation of a blood clot (coronary thrombosis). This event can also trigger coronary vasospasm. Ischemia induces profound metabolic and ionic perturbations in the affected myocardium and causes rapid depression of systolic function. Prolonged myocardial ischemia activates a "wavefront" of cardiomyocyte death that extends from the subendocardium to the subepicardium. Mitochondrial alterations are prominently involved in apoptosis and necrosis of cardiomyocytes in the infarcted heart.

This prospective, pilot, observational study performed confirmed the hypothesis that systematic identifications and interventions administered through continued physician follow-up and patients counselling will improve adherence to therapy and therefore improvement in treatment effectiveness by lowering especially Troponin level ,CPK and quality of life in MI patients.

Study was shown that lack of proper knowledge about disease and patients counseling and chronic treatment, most of patients takes disease and its treatment lightly and shows lower adherence attitude. The study analysis shown that female are generally more aware than males for adherence. Study analysis concluded that there was significant reduction in their Troponin level and CPK values in different comparison groups after each level of follow up.

Statistical analysis concluded that patients with adherence > 95% showed significant reduction in Troponin level and CPK values and patients with age group ≤50 shows more adherence than older.

Most heart patients recorded with hypertension and Coronary Artery Diseases only few ones with diabetic complications. During study patients shows good control over their blood pressure and only few adverse events but no complications occur during study period.

1. INTRODUCTION

Heart attack is a medical emergency, usually occurs when a blood clot blocks blood flow to the heart leads to the death of a segment of heart muscle. When it happens, a person experiences chest pain and electrical instability of heart tissue. Blockage is most often a build up of fat, cholesterol and other substances. Heart attack can also be termed as myocardial infraction, cardiac infraction and coronary thrombosis.

Myocardial infarction ("heart attack") is the irreversible damage of myocardial tissue caused by prolonged ischemia and hypoxia. This most commonly occurs when a coronary artery becomes blocked following the rupture of an atherosclerotic plaque, which then leads to the formation of a blood clot (coronary thrombosis). This event can also trigger coronary vasospasm**.** Ischemia induces profound metabolic and ionic perturbations in the affected myocardium and causes rapid depression of systolic function.

Common heart attack signs and symptoms include:Pressure, tightness, pain, or a squeezing or aching sensation in your chest or arms that may spread to your neck, jaw or back, Nausea, indigestion, heartburn or abdominal pain, oppressive pain, Shortness of breath, Cold sweat, Fatigue, Lightheadedness or sudden dizziness, Absence of chest-wall tenderness on palpation

METHODS

2.1 STUDY PROCEDURE

2.1.1 Study design

A prospective pilot study has been carried out between January 2020 and June 2020 in outdoor unit of the Heart & General Hospital, Jaipur.

2.1.2 Study population/ Research subjects:

A total of 60 individuals that are included in this study are diagnosed with myocardial infraction and had undergone surgery ,who are matched for Inclusion criteria consecutively attending the outpatient care clinic of the Heart & General Hospital, established through consultation with treating physicians are reviewed.

They are over 45 years of age and underwent heart surgery and treatment is majorly done by anti platlets and antianginal drugs . All study subjects gave written and oral informed consent as they were recruited at the heart care clinic. Subjects are randomly selected in this study who meets the Inclusion criteria.

2.1.3 Patient enrolment:

All patients who were hospitalized at HEART AND GENERAL HOSPITAL(a tertiary care public teaching hospital) between JANUARY 2020 and MAY 2020 with established diagnosis of heart failure (for at least 3 months' prior enrollment) and undergone heart surgery were consecutively enrolled for this study.

Sociodemographic, clinical, laboratory, echocardiographic, and adherence data were gathered using a structured questionnaire during the hospital admission of enrollment. Framingham criteria was used to screen participants for heart failure symptoms and a 2-dimensional echocardiography was utilized for diagnosis reconfirmation . Diagnosis of anemia utilized the WHO criteria i.e. Hemoglobin (Hb) concentration of < 13.0 g/dL and < 12.0 g/ dL for males and females respectively

To estimate the effect of heart attack drugs, post operation patient's were continuously monitored and recorded by follow up of patients for after 3 months and 6 months study

2.1.4 Patient counseling and Follow up

The all patients will be counselled regarding disease, medication, nutrition, exercise, foot care, eye care, personal hygiene, self monitoring of basic symptoms of heart attack , glucose & hypertension and self care. The patients will be counselled in the presence of concern treating physician of the Hospital.

The patients will be asked to come back for follow-up once in a 3 month, for a period of 90 days. During each follow-up, the patients will be educated, regarding their disease, medication and life style modification.

Initially, troponin levels , CPK ,ECG, base line blood plasma glucose level, BP were recorded for all 60 patients with the help of lab test record. Second intervention will be followed by collection of variable data record after 60 days of the first intervention.

2.1.5 Study variables

The dependent biochemical variable were troponin, creatine kinase, myoglobin, and lactate dehydrogenase , total Cholesterol, Triglycerides. The independent variables were the Treatment Adherence Behaviour, Attitude toward Treatment Adherence. Age, gender, educational level, marital status, hypertensive and Anti MI prescription were used as control variables.

2.1.6 Data collection:

After getting informed consent, patients were invited to participate when they had an appointment with their physician follow up via phone calls, and then interviewed in order to complete a CRF regarding certain personal characteristics, as well as to register the medical prescription (Antiplatlet drugs, Anti -anginal agents especially nitrates and beta blockers.)Three month later, the patients again visited to record study variables and treatment satisfaction and thereafter 6 months for the final data collection

3. RESULTS

3.1 Study Population

A baseline data of MI patients (n=60) were recorded initially and were followed up to Eight week for improvement in heart conditions and quality of life. Only patients (n=49) responded in 1st follow up (4 weeks) and patients (n=36) responded in 2nd follow up (next 4 weeks). Total 11 and 24 patients were failed to respond in 1st and 2nd follow up respectively. Patients received counseling for adherence at each follow up.
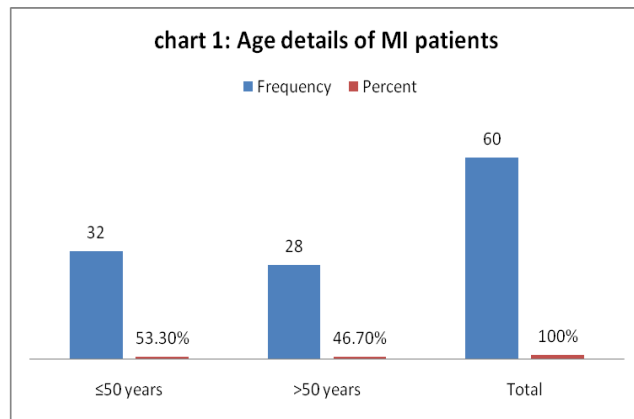
3.2 Baseline Demographic Detail of Patients

3.2.1 *Age*

Out of total enrolled 60 study patients, 32 patients (53.3%) with age ≤50 yr and 28 patients (46.7%) with age >50 yr were found, represented in table (Table 1).

Table 1: Age details of MI Patients

| Age	Frequency	Percent
≤50 years	32	53.3%
>50 years	28	46.7%
Total	60	100%

chart 1: Age details of MI patients

3.2.2 *Sex*
Out of total 60 study patients, 47 males (78.3%) and 13 females (21.7%) were enrolled under study, represented in table (Table 2).

Table 2: Sex details of MI Patients

Sex	Frequency	Percent
Female	13	21.7%
Male	47	78.3%
Total	60	100%

Chart 2 : sex details of MI Patients

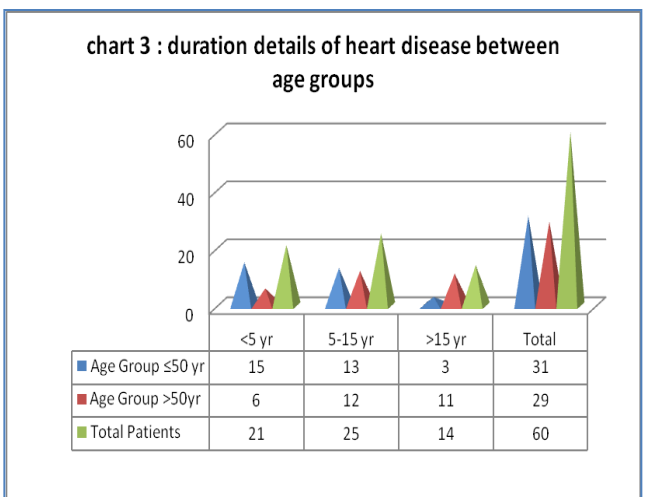|	Female	Male	Total
Frequency	13	47	60
Percent	21.70%	78.30%	100%
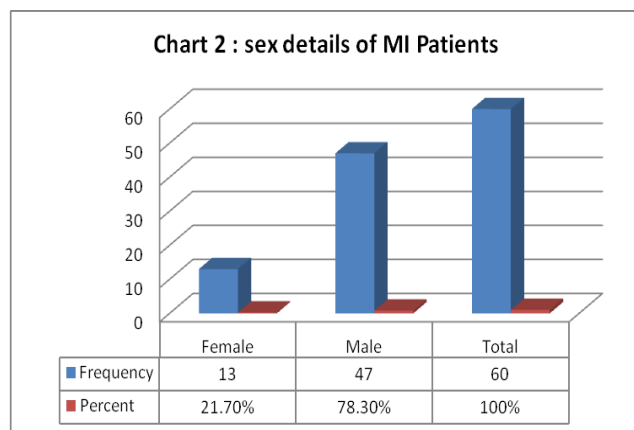
3.2.3   *Heart disease Duration between Age Groups*
Duration data of heart disease showed that there were, 31 patients with age group ≤50 years (15 Patients (48.38%) with <5 yr duration, 13 Patients (41.93%) with 6-15 yr duration, 3 Patients (9.67%) with >15 yr duration of heart disease) and 29 patients with age group >60 years (6 Patients (20.68%) with <5 yr duration, 12 Patients (41.37%) with 6-15 yr duration, 11 Patients (38.93%) with >15 yr duration of heart disease) with different duration of heart disease and are represented in table 3.

Table 3: Duration details of heart disease between age groups

Duration of heart disease	Age Group		Total Patients
	≤50 yr	>50yr	
<5 yr	15	6	21
5-15 yr	13	12	25
>15 yr	3	11	14
Total	31	29	60

chart 3 : duration details of heart disease between age groups

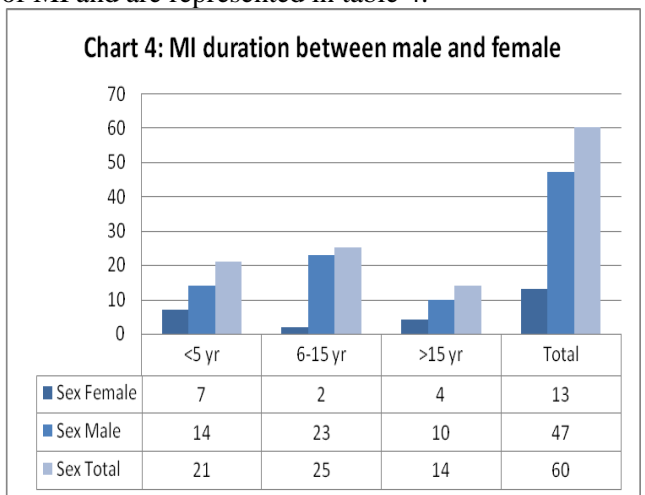|	<5 yr	5-15 yr	>15 yr	Total
Age Group ≤50 yr	15	13	3	31
Age Group >50yr	6	12	11	29
Total Patients	21	25	14	60

3.2.4 *MI Duration between Male and Female*
Table 4: Duration details of MI Male and Female Patients

Duration of MI	Sex		Total
	Female	Male	
<5 yr	7	14	21
6-15 yr	2	23	25
>15 yr	4	10	14
Total	13	47	60

Duration data of MI for both sex showed that there were, 21 patients (33.3% females and 66.7% males) with <5 yr duration, 25 Patients (8% females and 92% males) with 6-15 yr duration, 14 Patients (28.6% females and 71.4% males) >15 yr duration of MI and are represented in table 4.

Chart 4: MI duration between male and female

	<5 yr	6-15 yr	>15 yr	Total
Sex Female	7	2	4	13
Sex Male	14	23	10	47
Sex Total	21	25	14	60

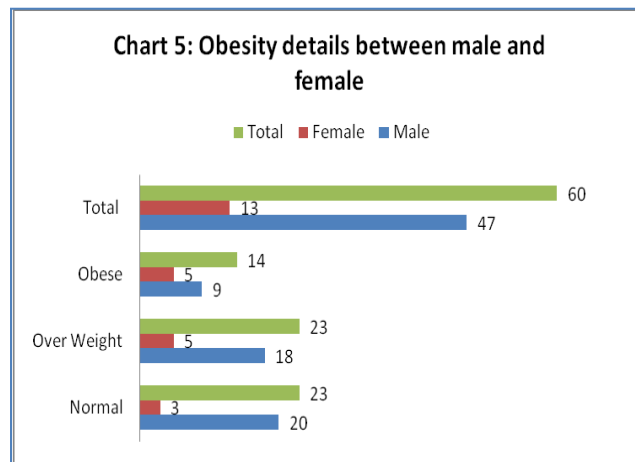### 3.2.5 *Obesity Details between Male and Female*
Obesity details of patients of both sex, based on their BMI Data showed that 14 patients (23.3%) were obese as shown in table 5.

Table 5: Obesity details of MI Patients

Age	Normal	Over Weight	Obese	Total
Male	20	18	9	47
Female	3	5	5	13
Total	23	23	14	60

Chart 5: Obesity details between male and female

3.3 Descriptive Statistical Details for Baseline and Follow up Variables

3.3.1 *Descriptive Details for Whole Population (Male)*

Total 47 males, out of 60 patients were enrolled and followed up for variables. At first follow up, 41 males (87.23%) and only 31 males (65.9%) and at second follow up only 30 males (63.82%) responded for variables and adherence as shown in table 6.

Table 6: Descriptive detail of whole MI Patients (Males)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	150.61 ± 39.380	132.07 ± 36.760	125.06 ± 42.344
PPG	216.10 ± 76.017	190.73 ± 49.866	177.53 ± 54.893
Troponin Level	0.43 ± 0.123	0.36 ± 0.086	0.09 ± 0.111
CPK	376.82 ± 33.130	256.87 ± 28.513	215.04 ± 22.670
BMI	26.46 ± 4.477	26.14 ± 3.907	25.64 ± 3.554
Cholesterol	356.46 ± 33.471	248.14 ± 15.907	155.55 ± 20.554
BP	150/100 ± 10/8	140/90 ± 10/6	130/90 ± 8/6

3.3.2 *Descriptive Details for Whole Population (Female)*

Total 13 Females, out of 60 patients were enrolled and followed up for variables. At first follow up, 8 females (61.53%) and only 6 females (46.1%) and at second follow up, 6 females (46.1%) responded for variables and adherence. Mean values with SD are shown in table 7.

Table 7 : Descriptive detail of whole MI Patients (Females)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	148.46 ± 20.895	117.75 ± 16.993	108.16 ± 21.245
PPG	227.92 ± 29.104	159.75 ± 36.046	155.00 ± 29.113
Troponin Level	0.44 ± 0.08	0.33 ± 0.06	0.08 ± 0.128
CPK	313 ± 42.440	188.75 ± 31.621	132 ± 27.071
BMI	28.31 ± 4.111	30.46 ± 4.621	30.98 ± 4.744
Cholesterol	305.31 ± 0.068	255.46 ± 25.070	158.96 ± 21.062
BP	150/112 ± 12/18	140/90 ± 10/6	130/90 ± 6/10

3.3.3 *Descriptive Details of MI Patients (Age ≤50 Yr.)*

Total 28 patients of both sexes with age ≤50 yr, out of 60 patients enrolled and followed up.

At first follow up, 23 patients (82.14%) and only 18 patients (64.28%) and at second follow up only 18 patients (64.28%) responded for variables and adherence. See table 8.

Table 8: Descriptive detail of MI Patients (≤50yr. of age)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	150.21 ± 43.077	126.04 ± 41.901	118.55 ± 43.980
PPG	204.14 ± 92.522	186.34 ± 50.788	174.00 ± 48.463
Troponin Level	0.44 ± 0.015	0.32 ± 0.084	0.11 ± 0.132
CPK	345.84 ± 22.605	245.60 ± 12.089	113.55 ± 22.986
BMI	28.26 ± 4.995	27.73 ± 4.341	27.00 ± 3.928
Cholesterol	280.56 ± 21.058	236.18 ± 16.180	170.051 ± 31.132
BP	140/108 ± 23/15	130/90 ± 10/6	130/90 ± 4/8

3.3.4 *Descriptive Details of MI Patients (Age >50Yr)*

Out of 60 patients, 32 patients of both sexes with age ≤50 yr were enrolled and followed up. At first follow up, 26 patients (81.25%) and only 19 patients (59.37%) and at second follow up only 18 patients (56.25%) responded for variables and adherence. Mean values with SD are shown in table 9.

Table 9: Descriptive detail of MI Patients (>50 yr. of age)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	150.09 ± 29.249	132.76 ± 27.335	125.94 ± 36.225
PPG	231.37 ± 33.694	185.07 ± 48.257	173.55 ± 56.481
Troponin Level	0.44 ± 0.021	0.32 ± 0.082	0.14 ± 0.121
CPK	348. 22 ± 23.010	243 ± 10.032	111.26 ± 25. 822
BMI	25.64 ± 3.517	26.07 ± 4.180	26.05 ± 4.545
Cholesterol	295.23 ± 20.333	233.013 ± 11.078	166.928 ± 25.162
BP	140/113 ± 25/18	125/90 ± 10/8	120/90 ± 3/5

3.3.5 *Descriptive Details of Patients with Duration <5 Yr*

Table 10: Descriptive detail of MI Duration group ≤5 years)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	151.00 ± 29.659	121.93 ± 32.431	103.38 ± 18.409
PPG	200.80 ± 88.697	171.25 ± 50.637	161.38 ± 44.612
Troponin level	0.46 ± 0.08	0.22 ± 0.346	0.09 ± 0.124
CPK	323.14 ± 15.22	256.11 ± 32.350	126 ± 22.156
BMI	27.18 ± 5.201	26.43 ± 4.128	26.62 ± 4.136
Cholesterol	356 .95 ± 42.201	248.043 ± 13.010	176 ± 20.162
BP	150/100 ± 10/8	130/90 ± 8/6	128/90 ± 8/6

Total 21 patients of both sexes with <5 yr of duration were enrolled initially and followed up. 16 patients (76.1%) and 13 patients (61.9%) at first follow up and only 18 patients (56.25%) at second follow up responded for variables and adherence. Mean values shown in table 10.

3.3.6 *Descriptive Details of Patients with Duration 6-15 Yr*

Total 25 patients of both sexes with duration 6-15 yr enrolled. At first follow up 21 patients (84%) and only 15 patients (60%) and 15 patients (60%) at

second follow up responded. Mean values with SD shown in table 11.

Table 11: Descriptive details of MI Duration group 6-15 yr)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	154.12 ± 47.916	137.80 ± 42.079	133.80 ± 50.182
PPG	229.72 ± 64.984	198.54 ± 51.876	184.80 ± 66.925
Troponin level	0.43 ± 0.011	0.36 ± 0.021	0.18 ± 0.111
CPK	381 ± 42.853	253.40 ± 22.111	99.72 ± 36.101
BMI	27.01 ± 3.858	27.30 ± 3.967	26.34 ± 3.522
Cholesterol	295 ± 33.072	210.77 ± 21.032	183 ± 25.062
BP	160/100 ± 8/11	130/90 ± 10/12	122/88 ± 2/8

3.3.7 *Descriptive Details of Patients with Duration >15 Yr*

Total 25 patients of both sexes with duration >15 yr enrolled initially. At first follow up 21 patients (84%) and only 15 patients (60%) and at second follow up 15 patients (60%) responded for variables and adherence, shown in table 12.

Table 12: Descriptive detail of MI Duration group >15 yr)

	Baseline (MEAN ± SD)	1st Follow Up	2nd Follow Up
FBG	141.78 ± 13.967	125.45 ± 15.351	131.25 ± 36.022
PPG	225.71 ± 25.205	180.90 ± 35.758	173.25 ± 23.150
Troponin level	0.46 ± 0.061	0.42 ± 0.063	0.33 ± 0.101
CPK	342.86 ± 20.629	302.54 ± 6.875	211 ± 23.645
BMI	26.11 ± 4.392	26.55 ± 5.390	26.73 ± 5.874
Cholesterol	300.11 ± 22.060	267.52 ± 20.063	195.73 ± 5.111
BP	160/100 ± 20/10	130/90 ± 3/7	130/90 ± 5/8

3.4 Descriptive Statistical Details for Quality of Life Data before and after Pharmacotherapy and Patient Counseling

3.4.1 *Descriptive Details of Quality of life for Mobility*

Quality of life accessed before and after surgery by QOL questionnaire contained five dimensions, each with three levels i.e. 1 for no problem, 2 for some problem and 3 for severe problem.

Out of total 60 patients, 45 patients (75%), 10 patients (16.7%), 5 patients (8.3%) respond for level 1, 2 and 3 respectively for QOL _ Mobility before surgery, therapy and counseling. likely out of total 49 patients, 41 patients (83.7%), 8 patients (16.3%), no patients responded for level 1, 2 and 3 respectively for QOL_ Mobility at the end of study.

About 11 patients failed to respond for QOL. Frequencies for each level with valid percent are shown in table 13.

Table 13: Descriptive detail of Quality of life for Mobility

Levels	Pre surgical QOL_Mobility		Post surgical QOL_Mobility	
	Frequency	Valid Percent	Frequency	Valid Percent
1.00	45	75.0	41	83.7
2.00	10	16.7	8	16.3
3.00	5	8.3	---	---
Total	60	100.0	49	100.0
Missing	---	---	11	---
Total	---	---	60	---

3.4.2 *Descriptive Details of Quality of life for Self Care*

Out of total 60 patients, 52 patients (86.7%), 2 patients (3.3%), 6 patients (10%) respond for level 1, 2 and 3 respectively for QOL _ Self care before surgery ,therapy and counseling. likely out of total 49 patients, 45 patients (91.8%), 3 patients (6.1%), only one patients (2%) responded for level 1, 2 and 3 respectively for QOL _ Self care at the end of study.

About 11 patients failed to respond for QOL. Frequencies for each level with valid percent are shown in table 14.

Table 14: Descriptive detail of Quality of life for Self-care

Levels	Pre surgical QOL_Self care		Post surgical QOL_Self care	
	Frequency	Valid Percent	Frequency	Valid Percent
1.00	52	86.7	45	91.8
2.00	2	3.3	3	6.1
3.00	6	10.0	1	2.0
Total	60	100.0	49	100.0
Missing	---	---	11	---
Total	---	---	60	---

3.4.3 *Descriptive Details of Quality of life for Usual Activity*

For QOL_Usual Activity before surgery, therapy and counseling, out of total 60 patients, 41 patients (68.3%), 14 patients (23.3%), 5 patients (8.3%) respond for level 1, 2 and 3 respectively.

likely out of total 49 patients, 37 patients (75.5%), 12 patients (24.5%), no patients responded for level 1, 2 and 3 respectively for QOL_Usual Activity at the end of study. About 11 patients failed to respond for QOL. Frequencies for each level with valid percent are shown in table 15.

Table 15: Descriptive detail of Quality of life for Usual Activity

Levels	Pre surgical QOL_Usual Activity		Post surgical QOL_ Usual Activity	
	Frequency	Valid Percent	Frequency	Valid Percent
1.00	41	68.3	37	75.5
2.00	14	23.3	12	24.5
3.00	5	8.3	---	---
Total	60	100.0	49	100.0
Missing	---	---	11	---
Total	---	---	60	---

3.4.4 *Descriptive Details of Quality of life for Pain and Discomfort*

Table 16: Descriptive detail of Quality of life for Pain & Discomfort

Levels	Pre surgical QOL_Pain_Discomfort		Post surgical QOL_ Pain_Discomfort	
	Frequency	Valid Percent	Frequency	Valid Percent
1.00	14	23.3	34	69.4
2.00	33	55.0	14	28.6
3.00	13	21.7	1	2.0
Total	60	100.0	49	100.0
Missing	---	---	11	---
Total	---	---	60	---

Out of total 60 patients, 14 patients (23.3%), 33 patients (55%), 13 patients (21.7%) respond for level 1, 2 and 3 respectively for QOL before surgery, therapy and counseling. Out of total 49 patients, 34 patients (69.4%), 14 patients (28.6%), only one patient (2%) responded for level 1, 2 and 3 respectively for QOL at the end of study. Frequencies are shown in table 16.

3.4.5 *Descriptive Details of Quality of life for Anxiety & Depression*

Out of total 60 patients, 36 patients (60%), 23 patients (38.3%), 1 patients (1.7%) responded for level 1, 2 and 3 respectively for QOL_Anxiety_Depression before surgery therapy and counseling. likely out of total 49 patients, 33 patients (67.3%), 15 patients (30.6%) and only one patients (2%) responded for level 1, 2 and 3 respectively as shown in table 17.

Table 17: Descriptive detail of Quality of life for Anxiety & Depression

Levels	Pre surgical QOL_Anxiety_Depression		Post surgical QOL_Anxiety_Depression	
	Frequency	Valid Percent	Frequency	Valid Percent
1.00	36	60.0	33	67.3
2.00	23	38.3	15	30.6
3.00	1	1.7	1	2.0
Total	60	100.0	49	100.0
Missing	---	---	11	---
Total	---	---	60	---

### 3.5 Descriptive Statistical Details of Post surgical Pharmacotherapy among Adherence Groups

3.5.1 *Descriptive Details of Adherence between Sexes*

For first follow up, mean percent adherence to pharmacotherapy for 41 males and 8 females were 91.27% and 93.72% whereas for second follow up, mean percent adherence to pharmacotherapy for 30 males and 6 females were 91.27% and 93.72%. Mean values with SD are shown in table 18.
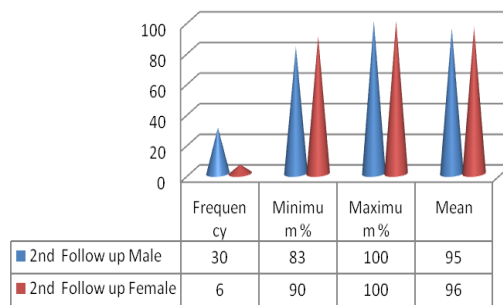
Table 18: Details of Adherence to Pharmacotherapy

Adherence	1st Follow up		2nd Follow up	
	Male	Female	Male	Female
Frequency	40	8	30	6
Minimum %	73.87	86	83	90
Maximum %	100	100	100	100
Mean	91.27	93.72	95	96
SD	7.860	5.010	5.000	4.000

Chart 6: Details of pharmacotherapy adherence on 1st follow up

	Frequency	Minimum%	Maximum%	Mean
1st Follow up Male	40	73.87	100	91.27
1st Follow up Female	8	86	100	93.72
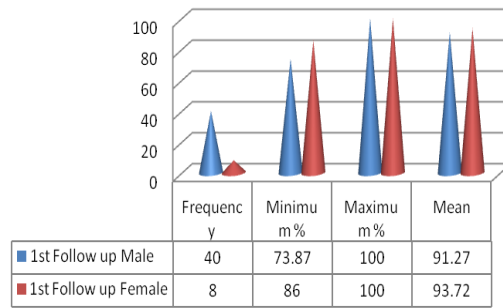
Chart 7 :Details of pharmacotherapy adherence on 2nd follow up

|	Frequency	Minimum%	Maximum%	Mean
2nd Follow up Male	30	83	100	95
2nd Follow up Female	6	90	100	96

### 3.5.2 *Descriptive Details of Sexes between Adherence Groups*

Table 19: Details of sexes between adherence groups for both follow up

Adherence Group	First Follow Up			Second Follow Up		
	Female	Male	Total	Female	Male	Total
0.0	7	16	23	7	17	24
≤85%	0	8	8	0	1	1
86-90%	1	5	6	1	5	6
91-95%	3	8	11	1	10	11
>95%	2	10	12	4	14	18
Total	13	47	60	13	47	60

Chart 8 : Details of sexes between adherence groups on 1st follow up
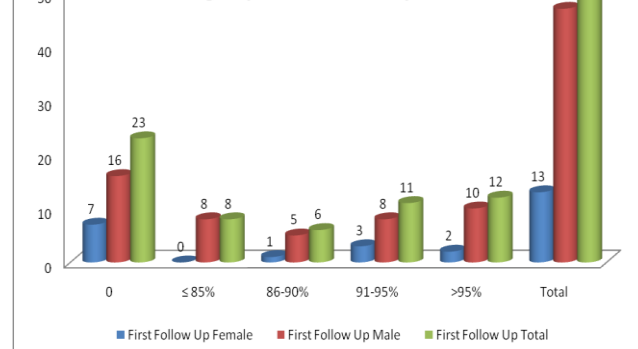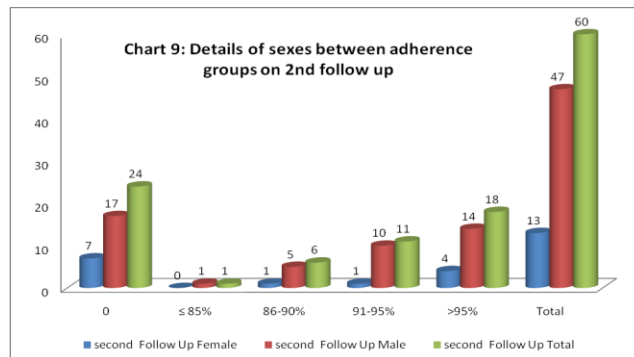
For first and second follow up, frequency distributions of both sexes for different adherence groups are shown in table 19 where, 23 patients (7males, 16 females) for first follow up and 24 patients (7males, 17 females) for second follow up showed no attitude for adherence. Mean values with SD are shown in table 19.

3.5.3 *Details of Troponin level and CPK among Adherence Groups*

Descriptive details of Troponin level and CPK mean values with their standard deviation among different adherence groups for first and second follow up are shown in table 20.

Table 20: Descriptive detail of FBG and PPG for among Adherence group

Adherence Group	Troponin level (MEAN±SD)		CPK (MEAN±SD)	
	1st Follow Up	2nd Follow Up	1st Follow Up	2nd Follow Up
≤ 85 %	0.42 ± 0.06	0.33 ± 0.03	320.02 ± 22.024	308.01 ± 18.015
86-90 %	0.31 ± 0.02	0.29 ± 0.01	301.11 ±29.011	285.45 ±11.153
91-95 %	0.26 ± 0.08	0.12 ± 0.03	211.02 ± 12.022	131.02 ± 23.012
> 95 %	0.08 ± 0.01	0.03 ± 0.01	92.46 ± 44.155	56.33 ±39.864
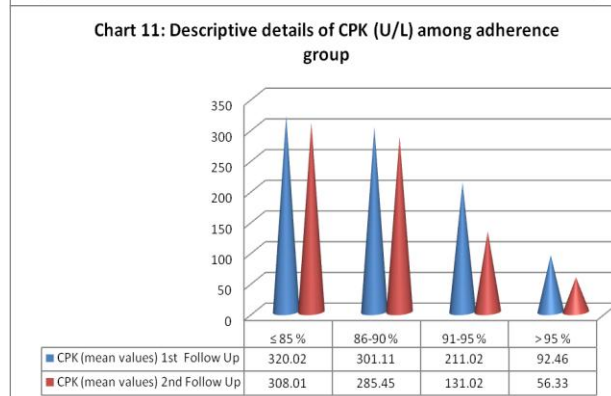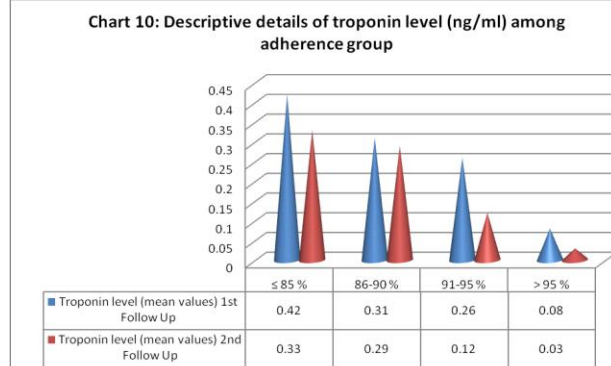
3.6 Descriptive Details of MI Pharmacotherapy
3.6.1 *Descriptive Details of Pharmacotherapy for Sex*
Table 21: Pharmacotherapy details between sexes

Treatment	Sex		
	Male	Female	Total
OHA	19	6	25
Insulin	11	1	12
OHA+Insulin	17	6	23
Total	47	13	60

Out of total 60 patients, 25 patients (41.7%) of both sexes received oral hypoglycaemic drugs, 12 patients (20%) of both sexes received insulin, 23 patients (38.33%) of both sexes received oral hypoglycaemic drugs + Insulin therapy. Frequency distributions of both sexes are shown in table 21.

3.6.2 *Detail of Prescribed Pharmacotherapy*
Table 22: Descriptive Details of Prescribed Anti -MI drugs

Pharmacotherapy		Baseline		1st Follow Up		2nd Follow Up	
		M	F	M	F	M	F
Beta blockers	Metoprolol tartrate	11	8	9	3	3	----
	Bisoprolol	18	5	13	4	9	1
nitrates	GTN	11	6	12	4	11	4
ACE inhibitors	Enalapril	19	7	16	3	10	2
	Benazepril	4	2	3	2	3	----
Calcium channel blockers	Amlodipine	3	----	3	----	3	----
	verapamil	4	----	2	----	1	----
	Diltiazem	1	2	----	2	----	2
	Nimodepine	----	----	-----	----	----	----
Statins	Atorvastatin	19	9	19	9	16	8
	Rosuvastatin	6	1	4	1	4	----
	Simvastatin	15	3	13	3	12	----
	Lovastatin	----	----	-----	----	----	----
Antiplatlet drugs	Clopidogrel	26	13	18	8	16	2
	Aspirin	28	13	26	12	21	8

3.7 Medical History of MI Patients

All 60 patients were questioned for previous medical history i.e. complications and comorbid conditions and were collected for all enrolled patients. Hypertension and other chronic diseases considered as comorbid conditions whereas CAD, retinopathy, neuropathy, nephropathy, ED and diabetic foot considered as complications. About 21.66% patients without complaint and 78.33% with complaint were recorded.

Table 23: Previous Medical History of MI patients

Previous Medical History	Sex		Total	Percent
	Female	Male		
Hypertension	8	20	28	46.66%
Thyroid dysfunction	4	0	4	6.67%
CAD	4	25	29	48.33%
Retinopathy	6	22	28	46.66%
Neuropathy	5	11	16	26.66%
Nephropathy	0	2	2	3.33%
Erectile Dysfunction/ED	0	21	21	35%
Diabetic Foot/Ulcer	2	8	10	16.66%
Without History	4	9	13	21.66%
With History	9	38	47	78.33%
Total	13	47	60	100%

3.8 Descriptive Details for Adverse Events or Reactions

Adverse events or reactions, if occurred were recorded during study period. Only 5 patients reported adverse event out of 60 patients and are hospitalized. 55 subjects reported no event or reaction.

Table 24: Details of Adverse Events or Reaction

Adverse event	Frequency		
	Male	Female	Total
No Event	43	12	55
MI attack	4	0	4
Allergic Reaction	0	1	1
Total	47	13	60

4. DISCUSSION

Patients with heart disease require self management and a life time struggle to maintain and increase the QOL .Post surgical heart patients requires special care and a good medical adherence regarding pharmacotherapy and counselling. Although treatment plans improves or include strategies to enhance patients QOL.

In our study , Prospective analysis of impact of pharmacotherapy adherence on treatment effectiveness in post surgical heart patients is associated with post surgical treatment adherence ,behaviour, self care , quality of life and patients counselling.

Under this study, total 60 patients were enrolled who undergone heart surgery and treated with anti anginal drugs, anti platlet drugs, antihypertensives, hypolipidemics and oral hypoglycaemic drugs and Insulin. Baseline data recorded at the initiation of study shows that out of total 60 patients, majority of patients were between 40-60 yr age group and were 78% male patients and 22% female patients. Most patients were belonged to urban area (79%) and had heart disease for long periods. Five male patients were newly diagnosed and were under 39 yr. of age. Out of 60 patients, 28 patients were > 50 yr of age and 32 patients were ≤ 50 yr of age. Out of 60 patients of both sexes, there were 25 patients with 6-15 yr duration of heart disease , 21 patients with <5 yr duration and 14 patients with >15 yr duration of heart disease were found. Under study, 14 patients (23.3%) were found obese and 38.3% were overweight and prone to obesity and rest were normal weight individuals.

Baseline data shows that out of total 60 patients, majority of patients (47 patients) were recorded with complications and only thirteen patients without any complications. It was observed that patients were suffered from acute metabolic complications like arrhythmias and cardiogenic shock. Similarly, out of total 60 patients, 46.66% patients with retinopathy, 26.66% with neuropathy, 3.33% with nephropathy, 35%% only male patients with erectile dysfunction and only 16.6% patients with diabetic foot or ulcer were reported.

Baseline data most importantly focused that majority of patients were suffered from coronary artery disease followed by MI. About 48.33% patients reported that they had CAD and are cured. Similarly 46.66% patients were with comorbid condition i.e. Hypertension out of total 60 patients. Only four female patients reported with thyroid dysfunction.

Follow up observations especially fasting and post prandial blood glucose and systolic and diastolic blood pressure, Cholesterol,CPK, Troponin level, body mass index were statistically analyzed with simple mean comparison method and adherence to pharmacotherapy in percentage was also recorded.

Findings of this study are consistent with the previous observations that proper management and treatment adherence improves heart conditions. Descriptive statistics of whole population (male) shows significant reduction in different variable as an impact of patient counselling on adherence and adherence to pharmacotherapy itself. Troponin level and CPK values were reduced significantly 16.27% to 79.06 % troponin level and 31.83% to 42.81 CPK for first and second follow up respectively from baseline with 62.79% Troponin level and 11.51% CPK reduction for second follow up from first follow up. BP and BMI showed minute reduction. Females showed more reduction in their troponin level and CPK values (troponin 25% & 81.81%, CPK 39.9% & 57.82 % for 1st and 2nd follow up respectively) .

Descriptive statistical analysis by simple mean comparison method of patients with age > 50 yr. and age ≤50years showed that patients with age ≤ 50 yr. reduced more Troponin level and CPK values (troponin 27.27% & 75%, CPK 28.98% & 67.32 % for 1st and 2nd follow up respectively) than patients with age > 50years (Troponin level 28.26 % & 67.39 %,CPK 30.21% & 68.12 % for 1st and 2nd follow up respectively). Patients with age ≤ 50 yr. showed reduction in BP and BMI whereas patients with age < 50 years showed minute increase in BMI. Patients with age > 50 yr. showed more improvement in drug adherence than patients with age .

Similarly when descriptive statistical analysis by simple mean comparison on patients with different duration group was made, it revealed that patients with duration <5 years showed more reduction

(Troponin level 52.17% & 80.43% for 1st and 2nd follow up respectively) than patients with duration 6-15 years (troponin level 16.27 % & 58.13 % for 1st and 2nd follow up respectively) and patients with duration >15 years (troponin level 8.69% & 28.26 %, for 1st and 2nd follow up respectively). Patients with all duration group showed minute elevation in their FBG, PPG, BP and BMI values either for first and second follow up. Maximum drug adherence was shown by patients with duration <5 years than other duration group but maximum improvement was seen in patients with duration 6-15 years with 4.8% increase from first follow up to second follow up.

Quality of life data were recorded at Pre and post surgical procedures , pharmacotherapy and then compared. When QOL data before and after therapy was compared for five dimensions viz. mobility, self care, usual activity, pain & discomfort and anxiety & depression, they revealed that there was improvement in patients with all five dimensions. Out of total 60 Patients, 83.7%, 91.8%, 75.5%, 69.4% and 65.3 Patients reported no problem for mobility, self care, usual activity, pain & discomfort and anxiety & depression respectively in Post surgical QOL that was 75%, 86.7%, 68.3%, 23.3% and60% in Pre surgical QOL. No patient reported severe problem for mobility and usual activity in after QOL that was 8.3% and 8.3% for mobility and usual activity in before QOL. Reduction was seen in severe problems of patients with self care, pain & discomfort and anxiety & depression. Similarly reduction in complaints of some problem was also observed. Maximum improvement was seen in self care activity where 91.8% patients reported no problem after QOL. Maximum patients (21.7%) complained for severe problem of pain & discomfort in before QOL but after QOL it reduced to only 2% that was significant reduction. Self care was the only dimension for which highest no of patients (86.7%) were reported no problem in before QOL. Similarly pain & discomfort dimension received minimum 23.3% patients with no problem in before QOL. Study also revealed that patients affected with anxiety and depression reported that these complications are largely linked with heart patients.

 Study data revealed that male were with fewer attitudes to adherence than females and under study majority of patients of both sexes showed no attitude to give adherence during whole study period. Although improvement in adherence was seen for both sexes but females were observed with more adherence (93.75 and 96% for 1st and 2nd

follow up respectively) than males after patients counselling. Females showed significant improvement than males in 91-95% and > 95% adherence group. No change was observed under adherence group 86-90% for both sexes. Comparison of different adherence groups for their Troponin levels and CPK values revealed that significant reduction was seen in Troponin level and CPK values when patients showed adherence more than 95%. Study data for pharmacotherapy revealed that majority of patients received Antiplatlets and anti-anginals than little difference with combination therapy. It was revealed that combination of clopidogrel and aspirin , beta blockers and statins received more faith of physician to treat MI thus majority of patients received above said combination. Under insulin treatment, both short and long acting insulin were used in combinations with oral hypoglycaemic drugs for majority of patients suffering from diabetes as well. Along with these drugs ACE inhibitors and Calcium channel blockers was also prescribed for few patients.

Study data showed that 91.7% patients were without any reaction or event. Only five cases of adverse event or reaction were reported under whole period of study. During study period only one female patient complaint for allergic reactions whereas four male complained for MI attack and were hospitalized. No acute complications and other comorbid conditions except hypertension and diabetes were observed.

Study showed that about 100% patients were fully satisfied with treatment prescribed to them.

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6. CONCLUSION

This prospective, pilot, observational study performed confirmed the hypothesis that systematic identifications and interventions administered through continued physician follow-up and patients counselling will improve adherence to therapy and therefore improvement in treatment effectiveness by lowering especially Troponin level ,CPK and quality of life in MI patients.

Study conclusion shows lack of proper knowledge about disease and patients counselling and chronic treatment, most of patients takes disease and its treatment lightly and shows lower adherence attitude. From study analysis it can be concluded that female are generally more aware than males for adherence. Study analysis concluded that there was significant reduction in their Troponin level and CPK values in different comparison groups after each level of follow up.

Statistical analysis concluded that patients with adherence > 95% showed significant reduction in Troponin level and CPK values and patients with age group ≤50 shows more adherence than older. Thus it can be concluded that for better control of MI attack and therefore quality of life, patient should have 100% adherence to pharmacotherapy and what advice has been given to him.

Study conclusion shows that most heart patients recorded with hypertension and Coronary Artery Diseases only few ones with diabetic complications. During study patients shows good control over their blood pressure and only few adverse events but no complications occur during study period.

Similarly study analysis concluded that post operative heart patients were fully satisfied with the treatment, had been given to them by physician at study site.

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