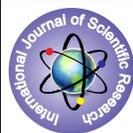


## Study o Weight and Metabolic Effects of Lifestyle Modification in Overweight Patients



### Medical Science

**KEYWORDS :** Obesity, lifestyle modification, cholesterol

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### ABSTRACT

**BACKGROUND-** Obesity is an increasing burden in the fast developing nations like India. It remains a major concern because of the increased prevalence of diseases like Diabetes, Hypertension and IHD.

**METHODS-** We have studied the effects of lifestyle modification in overweight patients by different anthropometric and biochemical parameters on OPD basis; comparing the values at a span of 6 months.

**RESULTS-** The problem of obesity is more prevalent in female than males. There was a marginal change in weight, blood sugar levels and HDL levels. LDL showed a modest decrease following lifestyle modification.

**CONCLUSION-** There was no significant change in different parameters by lifestyle modification of 6 months. The probable reason being a shorter duration of the study.

### INTRODUCTION

Overweight and obesity is a chronic health problem affecting increasing number of people worldwide and is now recognized as a global epidemic. In India, obesity is emerging as an important health problem particular in urban areas<sup>[1]</sup>. A dramatically rise in overweight has been recently shown to occur in many countries.<sup>[2]</sup>

Overweight and obesity is an excessive accumulation of energy in form of body fat, which impairs health. Obesity can be seen as the first wave of a defined cluster of noncommunicable diseases called "New World Syndrome," creating an enormous socioeconomic and public health burden in poorer countries. The World Health Organization has described overweight and obesity as one of today's most neglected public health problems, affecting every region of the world<sup>[3]</sup>.

In India almost 30-65% adult urban Indians are - either overweight/obese/abdominal obesity. The rising prevalence of overweight and obesity in India has a direct correlation with the increasing prevalence of obesity related co morbidities like hypertension, the metabolic syndrome, dyslipidemia, type II diabetes mellitus, cardiovascular disease<sup>[4]</sup>. India in grip of obesity epidemic and is the root for several non communicable diseases.

The main cause of overweight is clear; overeating, especially foods rich in fats, extracted sugars or refined starches. This combined with decline in physical activity results in imbalance of intake and expenditures of calories resulting excess weight and eventually obesity.<sup>[2]</sup>

If options of diet, exercise, and drug are applied at lower levels of obesity, nearly 15% of adult population of India will benefit and type 2 diabetes mellitus, cardiovascular disease dyslipidemia and arthritis could be prevented in them.

Role of lifestyle modification is weight loss and improvement in clinical abnormality of metabolic syndrome including blood glucose, lipid profile and blood pressure. It is effective in obesity related complication, hypertension and diabetes. Treatment alone cannot reverse the epidemic of obesity<sup>[4]</sup>.

### AIMS AND OBJECTIVE

1. To study the effects of weight changes in overweight patients.
2. To study metabolic changes in overweight patients after lifestyle modification and weight loss.

### MATERIALS AND METHODS

This study was carried out in 50 overweight patients in outdoor base.

### Inclusion criteria

Patient who were overweight.  
Patients age >15 to 60 years.

### Exclusion criteria:

Patients with ascitis, pregnancy are excluded.  
Patients who are on steroid therapy were excluded from Study.

### Methodology of waist circumference(WC) Measurement.

We measured waist circumference using non-stretchable flexible tape in horizontal position, just above the iliac crest, at the end of normal expiration, in the fasting state, with the subject standing erect and looking straight forward. WC is preferred over WHR as a measurement of abdominal Obesity.

We have studied 50 patients with overweight from OPD of general hospital. All the patients were evaluated for weight, height, waist circumference, BMI, laboratory investigation in form of FBS, PPBS, lipid profile, serum TSH, Electrocardiogram. All patients were followed up after 6 months. A detailed history was taken in all patients. Study participants were advised for lifestyle modification such as walking exercise 45 minutes daily, salt restricted diet, low fat, low carbohydrate, high fibre diet. Some people were also advised about yoga and meditation. All patients were examined for waist circumference before and after 6 months and student 't' test was applied for correlation of study.

### OBSERVATIONS

**TABLE NO 1: Age and Sex Distribution**

Age (years)	Male	Female	Total
15-25	1	3	4
26-35	5	8	13
36-45	4	11	15
46-55	5	6	11
56-60	4	3	7
	19	31	50

In present study out of 50 patients 31[62%] were female and 19[38%] were male.

Male: Female ratio was 1:1.63. In present study women were more overweight than men. Mean weight was 74.58 ± 8.8 before 6 months and 72.28 ± 8.5 after lifestyle modification means weight loss is there but p value is < .05 which is not much significant.

In present study there is no significant weight reduction after lifestyle modification.

**TABLE NO 2: Mean Weight In Kg In Male And Female In Present Study.**

Mean Weight in Kg				
	BEFORE 6 MONTHS	AFTER 6 MONTHS	P Value	Level of significance
Male	76.26 ± 8.56	74.26 ± 8.51	< 0.05	Non-significant
Female	73.19 ± 8.6	71.06 ± 8.55	< 0.05	Non-significant

**TABLE NO 2A: Mean Weight In Kg In Present Study.**

	Before 6 Months	After 6 Months	P Value
Mean Weight	74.58 ± 8.8	72.28 ± 8.5	< 0.05

In the present study mean weight in male and female before 6 months was 76.26 ± 8.56 and 73.19 ± 8.6 respectively and after 6 months it was 74.26 ± 8.51 and 71.06 ± 8.55 respectively.

In present study mean weight was 74.58 ± 8.8 before 6 Month and 72.28 ± 8.5 after 6 Month and p value is less than .05 so it is not significant.

**TABLE NO 3: Mean value of BMI in Male and Female in present study.**

	Mean BMI		P Value
	Before 6 Months	After 6 Months	
Male	27.98 ± 1.4	27.14 ± 1.3	<0.05
Female	28.19 ± 1.6	27.37 ± 1.4	<0.05

Females showed high BMI than males. In present study mean BMI before 6 months in men was 27.98 ± 1.4 and after 6 months it was 27.14 ± 1.3. Female showed mean BMI 28.19 ± 1.6 before 6 months and 27.37 ± 1.4 after 6 months which is not significant

**TABLE NO 4: Mean value of Cholesterol, HDL and TG before and after 6 month in present study**

	MALE			FEMALE		
	BEFORE 6 MONTHS	AFTER 6 MONTHS	P value	BEFORE 6 MONTHS	AFTER 6 MONTHS	P value
CHOLESTEROL	188 ± 26.21	177 ± 17.07	< 0.5	187 ± 26.83	176 ± 17.18	< 0.05
HDL	41.76 ± 3.32	43.16 ± 2.69	< 0.5	41.62 ± 3.46	43.83 ± 2.62	< 0.05
TG	151.16 ± 34.73	143.31 ± 25.84	< 0.5	156.07 ± 31.7	142.42 ± 24.80	< 0.05

In present study mean value of cholesterol before 6 months was 188 ± 26.21 and after 6 months it was 177 ± 17.07 in male, mean value of HDL was 41.76 ± 3.32 in male before 6 months, and 43.16 ± 2.69 after 6 months. Mean value of TG was 151.16 ± 34.73 before 6 months, and after 6 months it was 143.31 ± 25.84. All these values are statistically insignificant. Mean value of cholesterol, HDL and TG were respectively 187 ± 26.83, 41.62 ± 3.46, 156.07 ± 31.7 in women before 6 months, and 176 ± 17.18, 43.83 ± 2.62, 142.42 ± 24.80 respectively in women after 6 months of lifestyle modification.

**TABLE NO 5: LDL Levels According to Age Distribution**

Age (Years)	LDL (mg/dl) Before 6months	LDL (mg/dl) After 6months
15-25	101.26	91.14
26-35	112	102.30
36-45	122	110.7
46-55	108.49	92.36
56-60	107.77	98
Mean	110.304	99

The mean LDL was 110.3 before 6 months and 99 after 6 months of lifestyle modification, and high value was seen in 36-45 years age group. In present study 32% showed hypercholesterolemia, 54% showed hypertriglyceridemia, 8% had low HDL level before lifestyle modification, and there is no significant reduction in cholesterol and triglyceride level after 6 months of lifestyle modification.

The mean value of cholesterol, triglyceride and HDL were 187.86, 154, 43 respectively before 6 months, and 176, 142, 41.6 respectively after 6 months and it shows reduction in above value which suggests there is improvement in lipid levels after lifestyle modification.

**TABL NO 6: FBS and PPBS Levels in male and female before and after 6 months**

	MALE		FEMALE	
	BEFORE 6 MONTHS	AFTER 6 MONTHS	BEFORE 6 MONTHS	AFTER 6 MONTHS
FBS	107.1	102	111.38	105.25
PPBS	128.5	123	128.53	122.58

The mean FBS in male is 107.1 before 6 months, and 102 after 6 months. In female mean FBS before 6 months is 111.38, and after 6 months is 105.25

Mean PPBS in male before 6 months is 128.5 and 123 after 6 months. In female mean PPBS is 128.53 before 6 months, and 122.58 after 6 months

**TABLE 7: Mean Waist Circumference (WC) and Waist Hip Ratio(WHR) in men and women before and after 6 month of study**

	Mean WC before 6 month	Mean WC after 6 month	Mean WHR before 6 month	Mean WHR after 6 month
Men	102.7 ± 10.9	101.36 ± 9.3	1.06 ± .08	1 ± .06
Women	105 ± 11.8	103.51 ± 10.7	1.05 ± .08	1.04 ± .06

In present study mean waist circumference in male before 6 months was 102.7 ± 10.9 before 6 months, and 101.36 ± 9.3 after 6 months. While in women it was 105.36 ± 11.8 before 6 months and 103.51 ± 10.7 after 6 months of lifestyle modification. Women showed high waist circumference than men. There is no significant change in waist circumference.

Risk factors	No. of patients	Percentage
Hypertension	13	26%
Diabetes	11	22%
Hypothyroidism	8	16%
Ischemic Heart Disease	4	8%

**TABLE: 8 Risk factors associated with overweight patients**

In present study, out of 50 overweight patients, 13(26%) were associated with hypertension, 11(22%) were having diabetes type 2, 8(16%) were associated with hypothyroidism and 4(8%) had ischemic heart disease.

**DISCUSSION**

**TABLE NO-1 Mean weight in Kg . Joseph E Donnelly et al. study.**

	Baseline	4 Month	9 Month	16 Month
Mean Weight	94 ± 12.6	91.1 ± 10.6	88.7 ± 9.7	88.8 ± 9.5

While in Joseph E Donnelly et al. study showed mean weight 94 ± 12.6 at beginning of study and after 4 month it was 91.1 ±

10.6, which was significantly reduced and p value was less than .0001 that is more significant.<sup>[19]</sup>

**TABLE NO 2: Joseph E Donnelly et al. study of BMI**

	Mean BMI Before 9 month	Mean BMI After 9 month	P Value
Male (n=16)	29.7 ± 2.9	27.3 ± 2.3	<0.01
Female (n=25)	28.7 ± 3.2	26.5 ± 2.1	<0.01

. Joseph E. Donnelly et. al study showed mean BMI in men before 9 months was 29.7 ± 2.9 and after 9 months of lifestyle modification was 27.3 ± 2.3 while in women it was 28.7 ± 3.2 before 9 months and 26.5 ± 2.1 after 9 months of lifestyle modification and it shows p value < 0.01 which is very significant.<sup>[19]</sup>

**TABLE NO 3: Bret H. Goodpaster et. al study: Mean Value of Cholesterol, HDL and TG Before and after 4 months**

	MALE			FEMALE		
	BEFORE 6 MONTHS	AFTER 6 MONTHS	P value	BEFORE 6 MONTHS	AFTER 6 MONTHS	P value
CHOLESTEROL	202 ± 12	170 ± 13	< 0.01	193 ± 9	178 ± 10	< 0.01
HDL	47 ± 2	48 ± 2	< 0.05	46 ± 2	46 ± 2	< 0.05
TG	162 ± 23	116 ± 20	< 0.01	147 ± 19	105 ± 10	< 0.01

**P value < .01 significant**

In study of Goodpaster et. al showed significant reduction in cholesterol and triglyceride level after lifestyle modification and was very significant. There is no significant change in the level of HDL.<sup>[20]</sup>

**CONCLUSION**

In present study after lifestyle modification weight loss was there but it is not significant as compared to other study, and there is some beneficial effects in metabolic parameters of cholesterol, HDL and triglyceride level. Study demonstrates some beneficial effects of modest amount of weight loss with improvement in metabolic cardiovascular risk factors.

In present study it looks like no significant change, it is probably due to less weight loss i.e. around 3 kg in most of the patients compared to most of the other studies where the weight loss was significant and to the tune of >8 kg in an individual.

The other important reason of insignificant p value in our study is probably the duration of 6 months which is very less for lifestyle modification and weight reduction and to have subsequent effects of the same on metabolic changes.

Some Indian studies observed a strong correlation of various measures of overweight such as BMI, WC, WHR with various components of metabolic syndrome and also showed that overweight management and weight optimization should be the primary target of therapy in these individuals. Diet modification and control leads to control of overweight and lipids.

We would further like to conclude that studies with longer duration and larger patient number are required to demonstrate significant changes of lifestyle modifications on different parameters.

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