

Effect of Diet Restriction on Lipid Profile of Obese Subjects

ASIMA MALIK, NASREEN TALAT AND RAKHSHANDA FARID

Department of Biochemistry and Community Medicine, Fatima Jinnah Medical College, Lahore

ABSTRACT

A study was planned to find out the effect of restriction diet on lipid profile of obese subjects attending city slimming center. It was observed that there is a marked change in lipid profile of obese subjects. It was also concluded that although these slimming centers play a significant role in weight and lipid profile reduction but obese subject tend to regain lost weight within 6-8 months. It may be explained that diet regimen recommended by the slimming centers may not be maintained in the long run suggesting more studies to maintain the weight and level of lipid profile in obese subjects.

Key Words: Obesity; Body weight; Lipid profile

INTRODUCTION

In obesity, body accumulates an abnormal amount of adipose tissue. It results from a constant level or increased amount of food intake and gradual declining expenditure of energy in both physical activity and metabolism (Guyton, 1999). This results in an increased level of serum cholesterol, triacylglycerol and their related lipoproteins. This leads to medical consequences such as hypoxia, hypertension, atherosclerosis, diabetes etc. (Davidson, 1999). A relationship of coronary heart disease to serum cholesterol and its high-density lipoprotein (HDL) has also been reported. It was concluded that low level of HDL is a common antecedent of clinical coronary disease and its importance in accelerating the process of atherosclerosis (Stryer, 1996). Moreover, introduction of labor saving devices in homes, farms and industry have resulted in decreased energy needs, not paralleling with decreased food intake (Khan, 1984). There are a number of slimming centers and clinics in Lahore and other cities of Pakistan with a claim to help reducing body weight. The treatment at these centers consists of diet in powder or capsules form along with a restricted diet schedule.

The aim of the present investigation was to determine the effect of weight reduction on serum lipid profile i.e. totals lipid, cholesterol, triglyceride and lipoprotein (HDL, LDL and VLDL) of subjects attending clinics.

MATERIALS AND METHODS

Fifty obese subjects of both genders (age between 20 to 50

years) were randomly selected from the British Slimming Clinic in Lahore. Twenty normal (not obese) each male and females were kept as control. Blood samples of the under study subjects were taken, first at the time of joining the clinic and then after one month. These samples were analysed for total lipid, cholesterol, triglyceride, high-density lipoprotein (HDL) and low-density lipoprotein (LDL) by standard kit method (Merck and Bohringer). The data were statistically analysed (Steel & Torrie, 1984).

RESULTS AND DISCUSSION

It was observed that age of both male/female obese subjects and of control was the same (approximately 33 years). Mean body weight of both male and female was very high ($P < 0.001$) i.e. 226.91 and 199.40 lb in obese subjects compared with control 149.40 and 121.80 lb, respectively. Blood Pressure in obese and control in both males and females was statistically similar (Table I).

It is generally agreed that there is a direct relationship between obesity and risk factors like age, sex, blood pressure and lipid profile. It has been observed that most obese male/female were between the age of 32-34 years. It has been reported previously (Anonymous, 1983) that obesity develops with increasing age and is characterized by increased food intake and declining energy expenditure via activity and metabolism.

The diet introduced in a weight reducing program contained low fat and carbohydrate and high protein with vitamin and mineral supplement. After two weeks, moderate exercise was also added. Our study observed changes in

Table I. Values of Age, Body Weight and Blood Pressure in Male/Female Obese and Control Subjects

Variables	Male obese (25)	Male control (20)	Female obese (25)	Female control (20)
Age (yrs)	32.07±1.75	33.55±0.88	34.52±1.88	32.05±0.76
Weight (lbs)	226.19±11.01**	149.40±7.58	199.40±7.58**	121.80±2.30
Blood pressure (mmHg)	126.00/81.25 ±1.08/1.08	125.75/80.25 ±1.16/0.85	125.80/81.00 ±4.53/1.00	118.50/76.26 ±1.50/1.39

** $P < 0.001$ = Highly significant difference

lipid profile in male subjects during one month observation (Table II). It was also seen that level of total cholesterol and LDL-C was significantly decreased in both sexes (Table II & III). These findings are in agreement with a number of studies which observed that a single set of dietary modification achieves satisfactory lipid reduction in hypertriglyceridemic and hypercholesterolemic subjects (Tai *et al.*, 1999; Akanji *et al.*, 1999). Our findings are in contrast with the earlier workers who reported that weight reduction promptly decreases cholesterol synthesis and leads to a transitory reduction of serum cholesterol but does not have a permanent effect (Liuzzi *et al.*, 1999). It was noted that level of HDL-C was increased ($P < 0.001$; 25.55 vs 32.00). The level of triglyceride and total lipid also decreased ($P < 0.001$).

Previous studies have indicated that level of HDL is favourably influenced by weight loss as a result of diet and exercise in both sexes (Wood *et al.*, 1991; Stanfield & Hue, 1992). In women, level of HDL-C was significantly increased while level of LDL-C cholesterol was significantly decreased during one month, which is in confirmatory with conclusions of a Stanfield and Hue (1992) who reported that plasma lipoprotein metabolism, in women, is influenced by the circulating concentration of gonadal steroids. Changes in serum estrogens and androgen concentration, resulting, either from alteration in gonadal status or from administration of estrogens gonadal steroid, have been shown to be associated with changes in serum lipoprotein level (Wood *et al.*, 1991). On the other hand our findings are not in agreement with study of (Stanfield & Hui, 1992) who observed no change in level of HDL cholesterol in women undergoing diet and exercise.

Table II. Changes in Lipid Profile of Male Subjects (Values Expressed as Mean \pm S.E.M.)

Parameters	0 month	1 months
Total Cholesterol (mg%)	246.28 \pm 3.65	229.12 \pm 3.85***
HDL Cholesterol (mg%)	25.55 \pm 0.50	32.00 \pm 0.71***
LDL Cholesterol (mg%)	201.72 \pm 3.23	179.08 \pm 3.62***
Triglyceride (mg%)	140.70 \pm 11.53	125.08 \pm 4.97***
Total Lipid (mg%)	663.35 \pm 0.62	698.16 \pm 9.96***

** $P < 0.001$ = Highly significant difference

Table III. Changes in Biochemical Parameters of Female Subjects form 0-1 Months (Values expressed as Mean \pm S.E.M.)

Parameters	0 month	1 month
Total Cholesterol (mg%)	248.68 \pm 4.34	235.56 \pm 4.94*
HDL Cholesterol (mg%)	29.76 \pm 0.58	36.14 \pm 0.82**
LDL Cholesterol (mg%)	199.60 \pm 5.25	179.94 \pm 4.54***
Triglyceride (mg%)	109.00 \pm 10.56	101.24 \pm 1.76***
Total Lipid (mg%)	663.68 \pm 6.61	672.20 \pm 5.21***

* $P < 0.05$ = Significant difference

** $P < 0.001$ = Highly significant difference

CONCLUSION

Diet modified to restrict carbohydrate and fat intake with mild to moderate exercise recommended by city slimming centre usually results in decrease of total calorie intake which itself has a favourable effect on plasma lipid level. Although these slimming centres play a role in weight reduction and decrease the lipid profile. But it was observed that people tend to regain lost weight within 6-8 months. Reason may be that diet regimen of slimming centres is one that cannot be maintained in the long term. Hence, further research is needed to maintain the weight and level of lipid profile in obese subjects

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