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Lipid profile in obese and non- obese individuals

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Abstract

Background: To evaluate lipid profile in obese and non- obese subjects. **Methodology:** Eighty subjects in age ranged 30- 65 years of either gender were divided into 2 groups. Group I comprised of subjects with normal BMI and group II had subjects with raised BMI. Lipid profile such as triglyceride (TGL), total cholesterol, high density lipoprotein (HDL) and low-density lipoprotein (LDL) was measured. **Results:** The mean age in group I was 35.2 years and in group II was 36.4 years. Group I had 24 males and 16 females and group II had 22 males and 18 females. The difference was significant (P< 0.05). The mean total cholesterol in group I was 182.2 mg/dl and in group II was 162.4 mg/dl, triglyceride was 168.4 mg/dl in group I and 126.8 mg/dl in group II, HDL cholesterol was 42.6 mg/dl in group I and 41.4 mg/dl in group II and LDL cholesterol was 138.5 mg/dl in group I and 118.3 mg/dl in group II. The difference was significant (P< 0.05). **Conclusion:** It was found that level of total cholesterol and LDL level showed higher values in obese as compared to non- obese subjects.

Keywords: Lipid profile, Obese, Cholesterol.

INTRODUCTION

Obesity which increases the risk of cardiovascular disease, hypertension and diabetes mellitus. It is quite simply the result of caloric intake in excess of body needs. It usually begins in childhood or adolescence and the longer it is allowed to persist the less likely that it can be controlled. It is important to understand that obesity is not necessarily the result of over consumption of fat but it can result from excess calorie intake from any source whether carbohydrates or proteins. Obesity is associated with social and medical risks that especially make it a problem.[1]

Obesity increases the risk of cardiovascular diseases and diabetes especially when the extra fat is accumulated to central and intra-abdominal depots. The increased cardiometabolic risk in obesity is at least partly mediated through atherogenic dyslipidemia characterized by an increase in plasma triglycerides, large very low- density lipoprotein (VLDL) particles, small dense low- density lipoprotein (LDL) particles as well as low concentrations of high- density lipoprotein (HDL) cholesterol.[2]

The metabolic defects that ensue in obesity include increased levels of free fatty acids resulting from insulin resistance, increased LDL-cholesterol, VLDL and triglycerides and decrease in HDL-cholesterol.[3] It is most likely that presentation of increased free fatty acids to liver as a function of obesity is primarily responsible for over production of VLDL and this is probably the key to increased LDL via the sequence: VLDL→ intermediate density lipoprotein (IDL)→ LDL. VLDL production has also been shown to be directly related to insulin levels and per cent body fat.[4] Considering this, the present study was conducted to evaluate lipid profile in obese and non- obese subjects.

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METHODS

A sum total of eighty subjects in age ranged 30- 65 years of either gender was selected after obtaining written consent and ethical approval form institutional review board.

Demographic data such as name, age, gender etc. was recorded. A thorough examination was performed. All subjects were subjected to assessment of blood pressure, height, weight and BMI (Kg/m2). Patients were divided into 2 groups. Group I comprised of subjects with normal BMI and group II had subjects with raised BMI. Lipid profile such as triglyceride (TGL), total cholesterol, high density lipoprotein (HDL) and low-density lipoprotein (LDL) was measured. The results were compiled and subjected for statistical analysis using Mann Whitney U test. P value less than 0.05 was set significant.

RESULTS

Table 1: Comparison of parameters.

Parameters	Group I	Group II	P value
Mean age (years)	35.2	36.4	0.92
M:F	24:16	22:18	0.81

The mean age in group I was 35.2 years and in group II was 36.4 years. Group I had 24 males and 16 females and group II had 22 males and 18 females. The difference was significant (P< 0.05) [Table 1].

Table 2: Assessment of lipid profile in both groups.

Lipid profile (mg/dl)	Group I	Group II	P value
Total cholesterol	182.2	162.4	0.05
Triglyceride	168.4	126.8	0.02
HDL cholesterol	42.6	41.4	0.95
LDL cholesterol	138.5	118.3	0.01

The mean total cholesterol in group I was 182.2 mg/dl and in group II was 162.4 mg/dl, triglyceride was 168.4 mg/dl in group I and 126.8 mg/dl in group II, HDL cholesterol was 42.6 mg/dl in group I and 41.4 mg/dl in group II and LDL cholesterol was 138.5 mg/dl in group I and 118.3 mg/dl in group II. The difference was significant (P< 0.05) [Table 2].

DISCUSSION

Obesity refers to excess of body-fat which is due to greater energy intake compared to the energy expenditure. Obesity has been associated with an increased risk for metabolic syndrome in adults.[5] Studies indicate that body weight loss among obese individuals can improve lipid profile. However, the association between changes in BW and lipid profile among the general population, including both obese and non-obese individuals, is not fully investigated.[6] The WHO has described obesity as one of today's most neglected public health problems, affecting every region of the globe. The worldwide prevalence of obesity has nearly doubled between 1980 and 2008. Worldwide, at least 2.8 million people die each year as a result of being overweight/obese. Obesity has reached epidemic proportion in India with morbid obesity affecting 5% of the country's population.[7] It is also considered that changes in the function of individual lipids due to peroxidation, imbalanced fatty acid composition or their altered flux from peripheral atherosclerosis and diabetes.[8] The obesity and diabetes is as much an economic issue as it is a health issue. Physical inactivity and unhealthy diet are major causes for the change in social and economic conditions.[9] The prevalence of raised BMI increases with income level of countries up to upper middle- income levels.[10,11] The present study was conducted to evaluate lipid profile in obese and non- obese subjects.

Our results showed that the mean age in group I was 35.2 years and in group II was 36.4 years. Group I had 24 males and 16 females and group II had 22 males and 18 females. Bhatti et al.[12] in their study fifty adult subjects who were obese (body mass index > 25 Kg/m) and non-smokers were selected along with thirty non obese non-smokers as controls. Lipid profile was studied including total lipids, total cholesterol. HDL, LDL, VLDL and chylomicrons. Various ratios like LDL/HDL, VLDL/HDL, TG/HDL and TC/HDL ratios were calculated to find the risk of atherosclerosis and coronary heart disease. All the parameters except serum HDL. level showed significant increase in obese persons while HDL level was significantly decreased.

Our results showed that the mean total cholesterol in group I was 182.2 mg/dl and in group II was 162.4 mg/dl, triglyceride was 168.4 mg/dl in group I and 126.8 mg/dl in group II, HDL cholesterol was 42.6 mg/dl in group I and 41.4 mg/dl in group II and LDL cholesterol was 138.5 mg/dl in group I and 118.3 mg/dl in group II. Hoenig et al.[13] demonstrated that greater BMI levels and visceral obesity together with insulin resistance values were associated with increased cholesterol synthesis, suggesting that the excess of adiposity and enlarged measurements of waist circumference could be relevant to improve the relationship between TC and fasting glucose.

Framingham study has mentioned TC/HDL ratio to be one of the most powerful predictor of CHD and further suggested that it should be included in any coronary risk screening profile.[14] TC/HDL ratio of more than 4.5 generally required intervention. In a study by Otolorin et al.[15] there was no significant change in the TC cholesterol levels when compared to postmenopausal women with women before menopause.

CONCLUSION

It was found that level of total cholesterol and LDL level showed higher values in obese as compared to non- obese subjects.

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