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Original Research

Evaluation of lipid profile in obese and non- obese individuals

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ABSTRACT:
Background: Obesity refers to excess of body-fat which is due to greater energy intake compared to the energy expenditure. The present study was conducted to evaluate lipid profile in obese and non- obese subjects. **Materials & Methods:** 90 subjects of both genders in age range 25- 65 years were classified 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 36.2 years and in group II was 39.4 years. group I had 24 males and 21 females and group II had 22 males and 23 females. BMI was 32.1 Kg/m^2 in group I and 21.4 Kg/m^2 in group II. The mean total cholesterol in group I was 186.2 mg/dl and in group II was 160.4 mg/dl, triglyceride was 165.4 mg/dl in group I and 124.6 mg/dl in group II, HDL cholesterol was 43.6 mg/dl in group I and 42.4 mg/dl in group II and LDL cholesterol was 134.5 mg/dl in group I and 112.3 mg/dl in group II. The difference was significant ($P< 0.05$). **Conclusion:** The level of total cholesterol and LDL level showed significant difference among obese and non- obese subjects.
Key words: lipid profile, Obese, triglyceride

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INTRODUCTION

Studies indicate that body weight (BW) 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.[1] 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.[2] 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.[3]

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.[4] 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.[5,6] 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.[7] The present study was conducted to evaluate lipid profile in obese and non- obese subjects.

MATERIALS & METHODS

The present study comprised of 90 subjects of both genders. The age range was 25- 65 years. All were part of the study once they gave their written consent. Ethical approval for the study was taken.

Data such as name, age, gender etc. was recorded. A thorough examination was performed. Measurement

of blood pressure, height, weight and of BMI was done. We classified them 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 were compared and analysed statistically. P value less than 0.05 was considered significant.

RESULTS

Table I Comparison of parameters

Parameters	Group I	Group II	P value
Mean age (years)	36.2	39.4	0.71
BMI (Kg/m^2)	32.1	21.4	0.02
M:F	24:21	22:23	0.94

Table I, graph I shows that mean age in group I was 36.2 years and in group II was 39.4 years. group I had 24 males and 21 females and group II had 22 males and 23 females. BMI was 32.1 Kg/m^2 in group I and 21.4 Kg/m^2 in group II. The difference was significant (P< 0.05).

Graph I Comparison of parameters

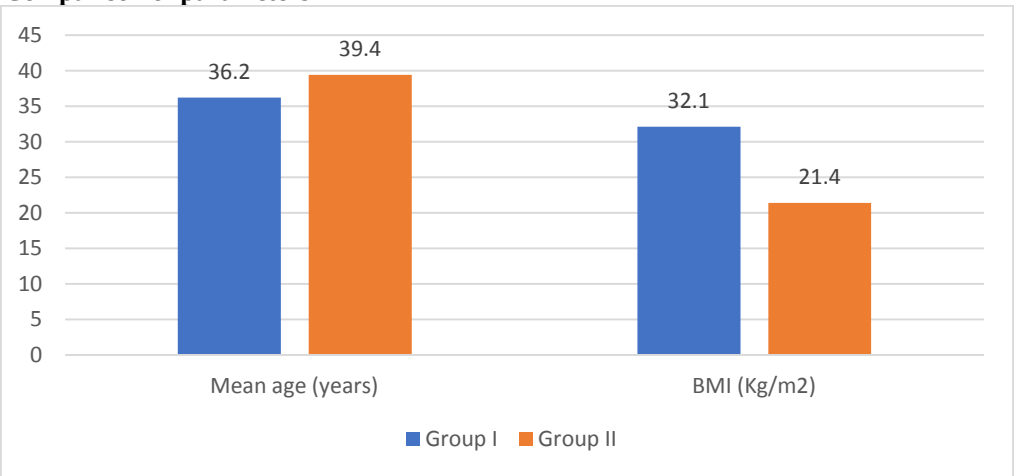
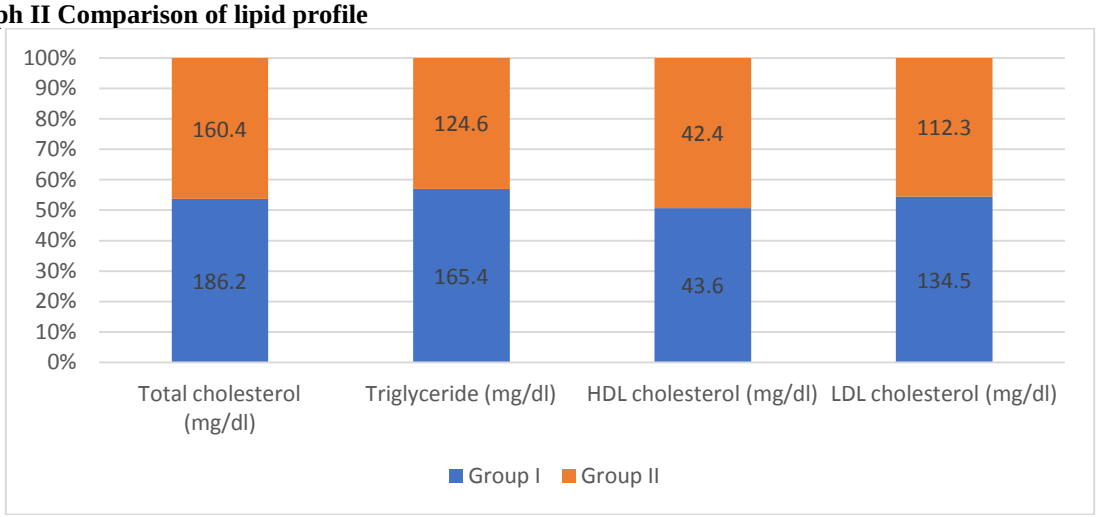


Table II Comparison of lipid profile

Parameters	Group I	Group II	P value
Total cholesterol (mg/dl)	186.2	160.4	0.04
Triglyceride (mg/dl)	165.4	124.6	0.93
HDL cholesterol (mg/dl)	43.6	42.4	0.81
LDL cholesterol (mg/dl)	134.5	112.3	0.02

Table II, graph II shows that mean total cholesterol in group I was 186.2 mg/dl and in group II was 160.4 mg/dl, triglyceride was 165.4 mg/dl in group I and 124.6 mg/dl in group II, HDL cholesterol was 43.6 mg/dl in group I and 42.4 mg/dl in group II and LDL cholesterol was 134.5 mg/dl in group I and 112.3 mg/dl in group II. The difference was significant (P< 0.05).

Graph II Comparison of lipid profile



DISCUSSION

Obesity increases the risk of cardiovascular diseases and diabetes especially when the extra fat is accumulated to central and intra-abdominal depots.[8] 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.[9] 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.[10] 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.[11] The prevalence of raised BMI increases with income level of countries up to upper middle- income levels. Studies have shown that obesity in males in the reproductive age group has led to an increase in male infertility, which may be associated with decreased pregnancy rates and increased pregnancy loss in couples who undergo artificial reproductive treatment.[12]The present study was conducted to assess lipid profile in obese and non- obese subjects.

In present study, mean age in group I was 36.2 years and in group II was 39.4 years. group I had 24 males and 21 females and group II had 22 males and 23 females. BMI was 32.1 Kg/m^2 in group I and 21.4 Kg/m^2 in group II. Kiriyama et al[13] in their study 2236 participants who underwent medical check-ups at least twice after excluding the participants whose follow-up period is <1 year or who were prescribed with any antihyperlipidaemic medications at the first and/or the last visit. We defined obesity as body mass index ≥25 kg/m^2. They categorized change in BW into three groups: loss (BW loss at the last visit ≥5%), stable (BW change between the first visit and the last visit <5%), and gain (BW gain at the last visit ≥5%). Lipid change was defined as the difference between the lipid profile at first and last visit, and we evaluated the change in lipid profile between three groups (BW loss, stable, and gain groups). They also evaluated the lipid profile change between the three groups in the obese and non-obese subgroups. Changes in total cholesterol (TC) between first and last visit were −4.0, 2.0, and 6.0 mg/dL, changes in low-density lipoprotein cholesterol (LDL-C) were −10.0, −1.0, and 5.0 mg/dL, changes in high-density lipoprotein cholesterol (HDL-C) were 3.2, −1.3, and −4.7 mg/dL and changes in triglyceride (TG) were −15.0, −1.0, and 11.5 mg/dL in the BW loss, stable, and gain groups, respectively ($P < 0.001$). Furthermore, similar changes in the lipid profile were seen among not only obese participants but also non-obese participants.

We found that mean total cholesterol in group I was 186.2 mg/dl and in group II was 160.4 mg/dl, triglyceride was 165.4 mg/dl in group I and 124.6 mg/dl in group II, HDL cholesterol was 43.6 mg/dl in group I and 42.4 mg/dl in group II and LDL cholesterol was 134.5 mg/dl in group I and 112.3 mg/dl in group II. Gianni et al[14] assessed the relationship of visceral adiposity and lipid profile with fasting (FPG) and post-load glucose (2hPG) in subjects without known diabetes (DM2). A total of 3030 subjects were divided in three groups: obese subjects (OB; n = 490), nonobese subjects with an increased waist circumference and nonobese subjects without an increased waist circumference. They performed a linear regression analysis among lipid fractions and fasting and 2hPG in the three groups, with or without diagnosis of DM2 after 2 hours PG. There was a significant association ($P < .01$) of high triglycerides and low high-density lipoprotein cholesterol (HDL-C) with fasting and 2hPG in all three groups such as for non-HDL cholesterol, whereas total cholesterol (TC) showed a significant correlation only with fasting glucose in OB and NOB/W+ subjects. The analysis with or without DM2 demonstrated no difference in the statistical significance, although a better correlation in subjects without DM2 was observed. In addition, for each quartile of TC a significant trend ($P < .01$) in prevalence of fasting hyperglycemia in obese and in NOB/W+ patients was observed.

CONCLUSION

Authors found that the the level of total cholesterol and LDL level showed significant difference among obese and non- obese subjects.

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