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Assessment of lipid profile level among healthy subjects and their relation with obesity: A clinical study

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Abstract

Background: The present study was conducted to assess lipid profile level among healthy subjects and their relation with obesity.

Materials & Methods: The present study was conducted on 284 healthy subjects of both gender. In all subjects, height, weight and BMI was calculated. Their total cholesterol, triglycerides, low density lipoproteins, high density lipoproteins and very low density lipoproteins was studied.

Results: Out of 284 subjects, there were 190 males and 94 females. The mean cholesterol in males was 180.2 mg/dl and in females was 165.7 mg/dl, HDL was 40.6 mg/dl in males and 51.8 mg/dl in females, LDL was 110 mg/dl in males and 98.4 mg/dl in females, VLDL was 24.6 mg/dl in males and 22.8 mg/dl in females. The difference was significant ($P < 0.05$). Out of 284 subjects, there were 34 (11.9%) obese subjects. There was significant higher level of lipid profile in obese subjects as compared to healthy subjects. The difference among males and females was significant ($P < 0.05$).

Conclusion: There was significant higher level of lipid profile in obese subjects as compared to healthy subjects.

Keywords: Obesity, Lipid, Triglyceride

Introduction

Lipids, represented by phospholipids, cholesterol, triglycerides (TG) and fatty acids, are considered essential to the human body. Dyslipidemia is a group of disorders associated with deranged plasma lipids and lipoprotein levels [1]. It is the most important risk factor responsible for the genesis of atherosclerosis leading to coronary heart disease, cerebrovascular disease and peripheral vascular disease. A high level of work stress has been associated with cardiovascular disease. However, the pathophysiological mechanisms underlying this association remain unclear [2].

Exposure to non-optimal levels of LDL cholesterol during young adulthood is a strong risk factor for coronary calcification later in life. LDL cholesterol levels during young adulthood are correlated with lipid levels later in life, but accounting for later-life lipid exposure did not explain the association of young adult LDL cholesterol levels with calcification [3]. After removing the potentially obscuring influences of medication use and clinically abnormal levels of other lipids, the graded association between non-optimal LDL cholesterol and coronary calcium remained, and we also observed an association with HDL cholesterol (in the opposite direction), but not with triglyceride. Our results suggest that atherosclerotic changes begin during young adulthood as a result of non-optimal lipids, that these changes persist into middle age, and that maintaining optimal levels of lipids (particularly LDL cholesterol) throughout young adulthood could provide substantial benefits in terms of lifetime CHD prevention [4]. The present study was conducted to assess lipid profile level among healthy subjects and their relation with obesity.

Materials and Methods

The present study was conducted in department of Internal Medicine. It comprised of 284 healthy subjects of both gender. All patients were informed and written consent was taken. The approval was obtained from institutional ethical committee.

General information such as name, age, gender etc. was recorded. In all subjects, height, weight and BMI was calculated. Their total cholesterol, triglycerides, low density lipoproteins, high density lipoproteins and very low density lipoproteins was studied. The

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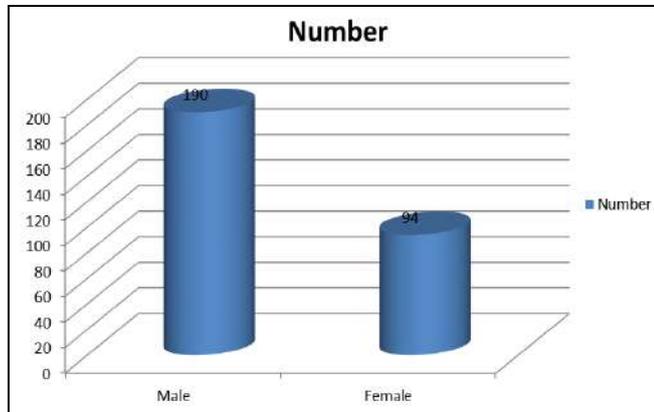
data collected was analyzed statistically. P value less than 0.05 was considered significant.

Results

Table I: Distribution of subjects

Genders	Males	Females
Number	190	94

Table I, graph I shows that out of 284 subjects, there were 190 males and 94 females.

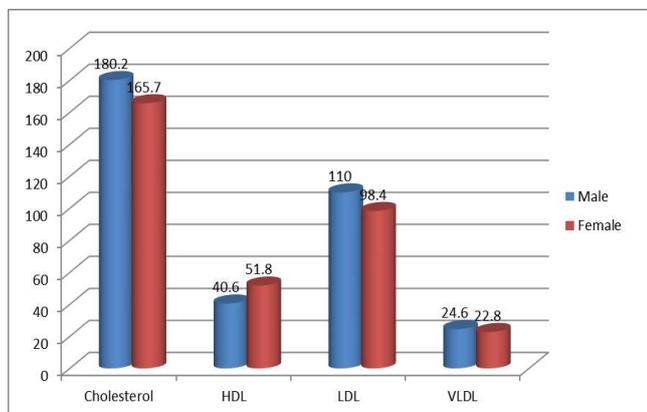


Graph I: Distribution of subjects

Table II: Assessment of lipid profile

Lipids (Mean)	Male	Female	P value
Cholesterol	180.2	165.7	0.05
HDL	40.6	51.8	0.02
LDL	110	98.4	0.05
VLDL	24.6	22.8	0.91

Table II, graph II shows that mean cholesterol in males was 180.2 mg/dl and in females was 165.7 mg/dl, HDL was 40.6 mg/dl in males and 51.8 mg/dl in females, LDL was 110 mg/dl in males and 98.4 mg/dl in females, VLDL was 24.6 mg/dl in males and 22.8 mg/dl in females. The difference was significant ($P < 0.05$).



Graph II: Assessment of lipid profile

Table III: Prevalence of Obesity in subjects

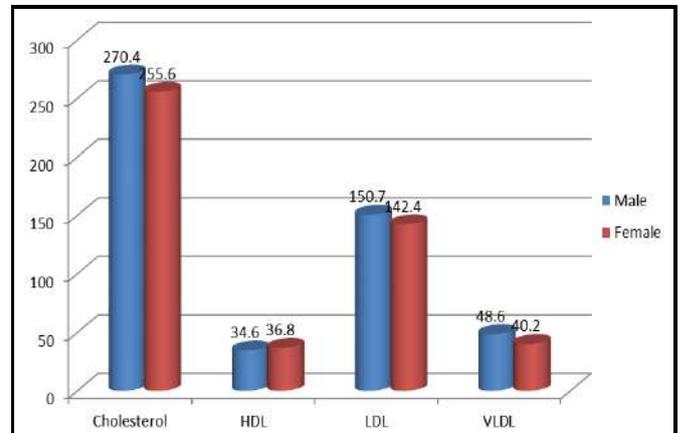
Total	Obese	Percentage
284	34	11.9%

Table III shows that out of 284 subjects, there were 34 (11.9%) obese subjects.

Table IV: Assessment of lipid profile in obese subjects

Lipids (Mean)	Male	Female	P value
Cholesterol	270.4	255.6	0.01
HDL	34.6	36.8	0.15
LDL	150.7	142.4	0.24
VLDL	48.6	40.2	0.78

Table IV, graph III shows that there was significant higher level of lipid profile in obese subjects as compared to healthy subjects. The difference among males and females was significant ($P < 0.05$).



Graph III: Assessment of lipid profile in obese subjects

Discussion

Dyslipidemia is a group of disorders associated with deranged plasma lipids and lipoprotein levels. It is the most important risk factor responsible for the genesis of atherosclerosis leading to coronary heart disease, cerebral vascular disease and peripheral vascular disease. Lipid disorders are prevalent in the world. Some of their risk factors are modifiable such as mental and physical stresses. The main etiology of lipid disorders is genetic factor and family history that is not changeable. In recent decade researchers have worked on risk factors for lipid disorders [5]. Hypertriglyceridemia, hypercholesterolemia, and related lipid disorders are very common, their prevalence are between 20% and 50% in different populations. Dyslipidemia, the main pathological factor in atherosclerosis, led to a number of interventional trials worldwide. Earlier the Lipid Research Clinics Coronary Prevention Trial Result I (LRC-CPPT) 1984 provided strong evidence for a casual role of the lipids in the pathogenesis of CHD [6].

Lipoproteins are mainly responsible for the transfer of cholesterol esters and triglycerides from the site of synthesis to the site of utilization [7]. These are classified according to their protein to lipid ratio and resultant density. Four major types of lipoproteins are chylomicrons comprising mainly triglycerides, very low density lipoproteins (VLDL) comprising mainly triglycerides, low density lipoproteins (LDL) which are the major cholesterol containing lipoproteins, high density lipoproteins (HDL) which are integral to reverse cholesterol transport (the transfer of cholesterol from peripheral tissue to the liver for catabolism and biliary elimination) [8]. The present study was conducted to assess lipid profile level among healthy subjects and their relation with obesity.

In this study, out of 284 subjects, there were 190 males and 94 females. We found that mean cholesterol in males was 180.2 mg/dl and in females was 165.7 mg/dl, HDL was 40.6 mg/dl in males and 51.8 mg/dl in females, LDL was 110 mg/dl in males and 98.4 mg/dl in females, VLDL was 24.6 mg/dl in males and 22.8 mg/dl in females.

Djindjić *et al.* ^[9] in their study, fasting samples of 914 subjects from healthy population were analyzed for total cholesterol, triglyceride and three major fractions of lipoproteins i.e. high-density lipoprotein cholesterol, low lipoprotein cholesterol and very low-density lipoprotein cholesterol. The values obtained were (in mg/dl) 165.7±30.2, 88.36±31.2, 44.86 ±10.68, 101.66±29.8 and 18.11±7.35 respectively. When these subjects were grouped according to the age and sex, no appropriate differences were observed between most of the groups. Triglycerides were found to be low and HDL cholesterol was high in female when compared with male of similar age. Beyond age 40 years cholesterol level and low density lipoprotein cholesterol was found to be gradually increased in case of women.

We found that out of 284 subjects, there were 34 (11.9%) obese subjects. There was significant higher level of lipid profile in obese subjects as compared to healthy subjects. Xu *et al.* ^[10] assessed the association between lipid responses to acute mental stress and fasting serum lipid levels 3 years later in 199 middle-aged men and women. Total cholesterol, low-density lipoprotein (LDL), and high-density lipoprotein (HDL) cholesterol increased following moderately stressful behavioral tasks. LDL cholesterol, HDL cholesterol, and total: HDL ratio measured 3 years later were predicted by acute stress responses independent of gender, age, socioeconomic position, change in body mass, smoking, alcohol consumption, or hormone replacement therapy baseline lipid levels.

Conclusion

Authors found there was significant higher level of lipid profile in obese subjects as compared to healthy subjects.

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