



A Comparative Study of Serum Lipid Profile between Young Male and Female Adults

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Abstracts

Introduction: Serum lipid profile is one of the major risk factors for cardiovascular disease. It also affected by the sex of the individuals. The present study was targeted to see the variation of serum lipid profile in both male and female.

Aims and Objective: The aim of the present study was to compare the serum lipid profile between male and female young adult. **Materials and methods:** The study was carried on 100 healthy subjects. The age, weight, height, body mass index and waist circumference of the subjects were noted and TC, TG, HDL, LDL were estimated in each subject.

Result: In the present study it was found that male subjects had higher level of TC, TG, LDL, and HDL than the female subjects.

Conclusion: The lower level of TC, TG, HDL and LDL in case of female subjects were due to effect of oestrogen but higher level in case of male raise the concern for implementation of life style modification.

Keywords: Total cholesterol (TC), Triglyceride (TG), High density lipoprotein (HDL), Low density lipoprotein (LDL).

Introduction

Cardiovascular diseases are the major cause of death in our society. Progressive urbanization and adoption of a “western” lifestyle contributes to rising burden of cardiovascular disease (CVD) in the developing world.^{1,2,3} In India, the death rate from CVD has increased at an alarming rate and is estimated currently as 52 per cent (Gupta, 2001). Indians all over the world have highest rates of mortality and morbidity from heart disease as

compared to blacks, Hispanics and other Asians. Prevalence of CVD in urban India is about double that of rural India (5%) and about four fold higher than in US (2.5%).⁴

Lipid profile, also known as coronary risk panel or lipid panel, is the collective term given to the estimation of typically, total cholesterol, high-density lipoprotein cholesterol, low-density lipoprotein cholesterol, and triglycerides, used to assess risk of coronary heart disease.⁵

Cardiovascular risk factors start early, track through the young age and manifest in middle age in most societies. CVD in developing countries are characterized by early age of onset and greater mortality. Cardiovascular risk factors have been studied in the younger populations- children, adolescents and youth in different parts of the world.⁶

The relation between total cholesterol (TC) and low density lipoprotein cholesterol (LDL-C) levels and the incidence of CAD and peripheral vascular disease (PVD) is now well established.⁷ Epidemiological studies have shown parallel, age-related trends of atherosclerotic lesions in the abdominal aorta, carotid, and coronary arteries.

Hypercholesterolemia is a serious health problem and is a major risk factor for cardiovascular disease. It is estimated that, annually hypercholesterolemia causes 56% of ischaemic heart diseases and 18% strokes. India too, is experiencing an alarming increase in cardiovascular diseases. Cardiovascular diseases accounted 32% of all death in India in 2000. The WHO estimated that by 2010, almost 60% of world's cardiac patients will be of Indian origin.⁸ Previous data on the effect of age and gender in serum lipids levels gave mixed results. There were repeated evidences that LDL-cholesterol tend to rise with age in both sexes^{9,10}. Conversely, considerable studies prove significant negative correlation between total and/or LDL cholesterol and age¹⁰. On the other hand, estrogens increase HDL^{11,12} but also enhance hepatic clearance of LDL^{13,14} and thus decrease LDL levels. Therefore, low postmenopausal oestrogen is expected to decrease HDL/LDL ratio; putting elderly women at higher risk of atherosclerosis-related disorders. However, some previous studies demonstrated high HDL but low LDL in elderly women compared to men^{15,16}. The findings of such studies actually compromise the understanding of the normal actions of oestrogen and deserve further researches and investigations.

Also an aggressive screening for prevalence of coronary risk factors at an early age remains the mainstay in primary prevention of CVD.

Material and Methods

In the present study 100 subjects of 20-35 years of age were selected in around the Dibrugarh town. Out of the 100 subjects 50 were male and 50 were female. The subjects having history of diabetes mellitus, hypertension or any other disease were excluded from the study. The individual was kept fasting for 8-12 hours prior to the test. Only water was permitted. About 3 ml of blood was collected from the antecubital vein. The collected blood was centrifuged and was tested for fasting Serum cholesterol, Fasting serum Triglycerides, High density lipoprotein cholesterol (HDL- C), and Low density lipoprotein cholesterol (LDL-C) by Cholesterol oxidase-peroxidase Method (CHOD-PAP method), GPO/PAP method, PEG/CHOD/PAP method, Friedewald's formula respectively. FRIEDEWALD'S FORMULA:

$$\text{LDLchol} = \text{Totalchol.} - \text{HDLchol} - \text{TG}/5^{10}$$

The BMI of the subjects was measured and waist circumference was measured with the help of standard measuring tap at the level of the umbilicus or the highest point of the iliac crest.

Result

The present study was carried out to find out the range of serum cholesterol in healthy young subjects in the age group (20-35) years and to see the correlation of serum lipid profile with sex of the study population. The study was carried on 100 healthy subjects during the period of September'2012 to August'2013 in the Department of Physiology, Assam Medical College and Hospital.

The age, weight, height, body mass index and waist circumference of the subjects were noted and the serum lipid profile was estimated in each subject. The results obtained during the study are presented from tables 1 to 17. Student's t-test was done to analyze the quantitative data and to determine the p value.

In the present study 85% of the cases were clustered in the age group of (20- 25) years, 06% in the age group of (26-29) years and 09% were in the age group of (30-35) years.

Table 1: showing distribution of case according to the age

Age group (in years)	No. of cases	%
20 - 25	85	85
26 - 30	09	09
31 - 35	06	06

There were 50 males and 50 females among cases in the study. The male to female ratio was 1:1.

Table 2: showing the distribution of case according to sex

Sex	No. of cases	Percentage (%)
Male	50	50
Female	50	50
Total	100	100

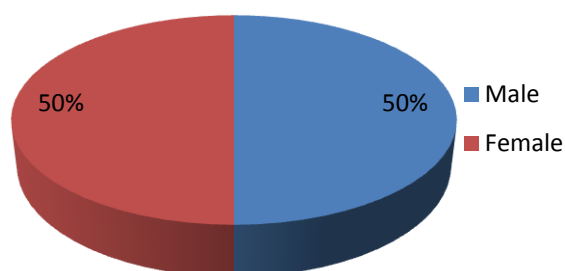


Fig 1: Pie diagram showing the sex distribution in study population

The present study showed that in male, the serum cholesterol was found to be (165.32 ± 25.46) mg/dl, triglyceride (95.36 ± 4.24) mg/dl, HDL (52.32 ± 2.83) mg/dl, and LDL was (93.56 ± 26.02) mg/dl. In female, the serum cholesterol was found to be (155.66 ± 11.31) mg/dl, triglyceride (88.28 ± 44.24) mg/dl, HDL (49.90 ± 2.83) mg/dl, and LDL was (88.01 ± 13.30) mg/dl.

Table 3: showing the lipid profile in male and female subjects:

	TC (mg/dl)	TGL (mg/dl)	HDL (mg/dl)	LDL (mg/dl)
Male	165.32 ±25.46	95.36 ± 4.24	52.32 ± 2.83	93.56 ±26.02
Female	155.66 ±11.31	88.28 ± 44.24	49.90 ± 2.83	88.01 ±13.30

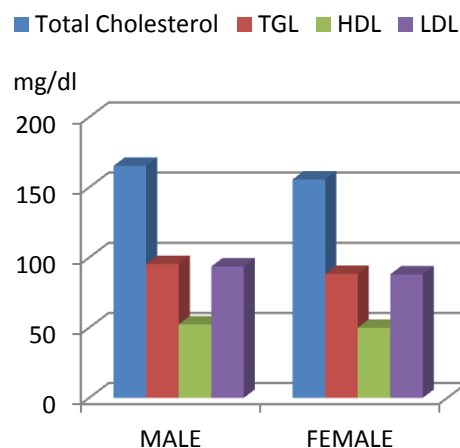


Fig 2: Bar diagram presenting the serum lipid profile in male and female subjects.

The present study showed a decrease level of total cholesterol, TGL, HDL, LDL in female subjects in comparison with the male subjects. Which was also statistically significant (p<0.001).

Discussion

The present study showed a significant decrease in serum level of total cholesterol, TGL, HDL, LDL in female subjects in comparison to the male subjects of the study population.

Oestrogen decreases adipose tissue by decreasing lipoprotein lipase activity and increasing hormone-sensitive lipase (i.e., it has a lipolytic effect). Loss of oestrogen results in the accumulation of adipose tissue, especially in the abdomen.¹⁷

There are different studies showing different results. In a study done by Tarig A. Marhoum et al; showed HDL-cholesterol was significantly less in males (M±SD = 45.2±13.76 mg/dl) compared to females (M±SD = 51.8±14.9 mg/dl, P= 0.032).¹⁸

In another study done by Dr. Balasim Rasheed Habib Alquraishi, Eman Rababah which include 96 students of age group 18-31yrs showed that the mean total concentration of cholesterol, LDL-c and Non HDL (mg/dl) in males (165.88 ± 32.20 , 85.00 ± 39.94 , 105.09 ± 34.22) respectively is less than in females (194.27 ± 52.04 , 125.32 ± 50.39 , 139.14 ± 51.35) correspondingly. The mean total concentration of HDL-c and TG (61.97 ± 13.29 , 94.80 ± 53.65) respectively are higher in male than those in female (54.57 ± 13.14 , 71.75 ± 35.51) correspondingly.¹⁹

In a study done by Berkant Muammer Kayatekin*, Ilgi Semin et al; which compare include athletic and non athletic men and women showed that the sportswomen's HDL-C levels were higher ($P < 0.05$); and TC, TG, and LDL-C levels were lower ($P < 0.001$) than those of sportsmen's levels. The non-sporting women's TC and TG levels were lower than those of non-sporting men's levels ($P < 0.00$). HDL-C/TC ratio of active females was higher than that of control females ($P < 0.01$).²⁰

Conclusion

The present study showed that there is significant decrease in serum total cholesterol, TG, HDL, LDL level in female subjects in comparison to the male subjects which may be due to the effect of oestrogen hormone on lipid metabolism in female. Again some studies showed different results which indicate further study of serum lipid profile in post menopausal and young women.

Acknowledgment

We are thankful to the principal cum chief superintendent, Assam Medical College and Hospital for kindly allowing us to carry out my research work.

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