

## COMPARISON OF LIPID PROFILE IN DIABETIC AND NON DIABETIC MALE AND FEMALE BELOW AND ABOVE THE 45 YEARS OF AGE GROUP

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### ABSTRACT

**INTRODUCTION:** Incidence of diabetes mellitus in human population has reached epidemic proportions worldwide, and it is increasing at rapid rate. Many large scale analyses have demonstrated a nearly linear correlation between the total cholesterol and low density lipoprotein (LDL) cholesterol and the severity of atherosclerosis. It has also been seen the inverse relationship between symptomatic atherosclerosis and the high density lipoprotein (HDL) cholesterol level.

**OBJECTIVE:** The goal of our study is to estimate blood sugar, total cholesterol, HDL and LDL level in male and female. **METHOD:** 40 male and 40 female are below the 45 years of age and 40 male and 40 female are above the 45 years of age. In the present study 80 normal individuals (Controls) and 80 diabetic patients suffering from Non-insulin dependent diabetes mellitus have been investigated. The entire subject were instructed about study and written consent taken. History and clinical examination was done. Blood sugar, total serum cholesterol, serum LDL cholesterol and serum HDL cholesterol level is estimated in biochemistry laboratory by calorimetric method. Statistical analysis was done by unpaired t test. P value less than 0.05 considered as a significant. **RESULTS:** Total cholesterol level is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic. HDL cholesterol level is significantly ( $p < 0.001$ ) lower in diabetic patients as compared to non diabetics. LDL cholesterol is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic. Total cholesterol level and LDL cholesterol level are significantly ( $p < 0.001$ ) higher in above 45 years male and female than below 45

years of male and female. HDL cholesterol level is significantly ( $p < 0.001$ ) higher in above 45 years of female than below 45 years of female but HDL cholesterol level is not significantly ( $p > 0.05$ ) change in below and above 45 years of male.

**CONCLUSION:** Total cholesterol level is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic. HDL cholesterol level is significantly ( $p < 0.001$ ) lower in diabetic patients as compared to non diabetics. LDL cholesterol is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic.

**KEY WORDS:** Diabetes mellitus            Atherosclerosis            HDL

Total cholesterol    HDL    Myocardial ischaemia

## **INTRODUCTION:**

Diabetes mellitus is a clinical syndrome characterized by chronic hyperglycemia and disturbance of carbohydrate, fat and protein metabolism due to absolute or relative deficiency of insulin action, evolving from interaction of varieties of genetic and environmental factors. Lurine gave the first suggestion – diabetes are extremely prone to ischaemic heart disease as early as 1922 (5,6). Type 2 diabetes mellitus typically double the ischaemic heart disease in men and triples in women (1,3).

In 1951, Barr et al has documented the negative association between high density lipoprotein (HDL) and ischemic heart disease. Medical expert think that HDL tends to carry cholesterol away from the arteries and back to the liver, where it's passed from the body. Some expert believed that HDL removes excess cholesterol from plaque in arteries, thus slowing the buildup (2, 5). The risk of coronary heart disease rises as blood cholesterol level increase. A person at level 240 mg/dl of total cholesterol and above have more than twice the risk of heart disease as someone whose cholesterol level is below 200 mg/dl (3).

If patient do not have coronary heart disease or diabetes LDL goal is  $<160$  mg/dl (4). If there is no coronary heart disease or diabetes and have two or more risk factors LDL goal is less than 130 mg/dl (1, 8). If coronary heart disease or diabetes are present LDL goal is  $< 100$  mg/dl. NCEP (National Cholesterol Education Programme) Guideline = HDL  $< 40$  mg/dl as low, implying as increased risk of CVD.

## **MATERIALS AND METHODS:**

In the present study 80 normal individuals (Controls) and 80 diabetic patients suffering from Non-insulin dependent diabetes mellitus have been investigated. 40 male and 40 female are below the 45 years of age and 40 male and 40 female above the 45 years of age.

Experimental protocol was explained and consent was taken.

History was taken and clinical examination (general and systemic) done for inclusion and exclusion criteria.

➤ Inclusion criteria:

- 1) Male and female with age group of below and above the 45 years.
- 2) Healthy individual without any known disease.
- 3) No history of drug, blood transfusion or any condition that affect blood cell count.

➤ Exclusion criteria :

- 1) Individual with any known general or systemic disease.
- 2) Any history of drug or medication that affect blood cell count.
- 3) Female with pregnancy and menstrual period.
- 4) Any un co-operative individual.

➤ Experimental protocol :

- 1) All the subjects filled the consent form that they are willing to participate in the study.
- 2) History and clinical examination was done for inclusion and exclusion criteria.
- 3) Subject's blood sugar, total serum cholesterol, serum LDL cholesterol and serum HDL cholesterol level is estimated in biochemistry laboratory by calorimetric method.
- 4) Then mean value and standard deviation was estimated by statistical method.

## **STATISTICAL ANALYSIS:**

Unpaired t test is used for analysis and P value less than 0.05 consider as a significant.

**RESULTS:**

Total cholesterol level is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic. HDL cholesterol level is significantly ( $p < 0.001$ ) lower in diabetic patients as compared to non diabetics. LDL cholesterol is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic. Total cholesterol level and LDL cholesterol level are significantly ( $p < 0.001$ ) higher in above 45 years male and female than below 45 years of male and female. HDL cholesterol level is significantly ( $p < 0.001$ ) higher in above 45 years of female than below 45 years of female but HDL cholesterol level is not significantly ( $p > 0.05$ ) change in below and above 45 years of male.

TABLE 1: Total cholesterol, HDL cholesterol, LDL cholesterol in diabetic and controls below 45 years of age of male.

Parameters	Diabetic	Controls	Significance
Total cholesterol (mg/dl)	184.40 ± 10.59	191.05 ± 14.15	NS
HDL cholesterol (mg/dl)	46.75 ± 3.90	41.50 ± 5.03	S
LDL cholesterol (mg/dl)	124.46 ± 15.53	125.15 ± 19.80	NS

TABLE 2: Total cholesterol, HDL cholesterol, LDL cholesterol in diabetic and controls below 45 years of age of female.

Parameters	Diabetic	Controls	Significance
Total cholesterol (mg/dl)	163.00 ± 7.99	173.90 ± 8.20	S

HDL cholesterol (mg/dl)	54.05 ± 2.16	50.00 ± 2.26	S
LDL cholesterol (mg/dl)	97.05 ± 7.02	98.50 ± 5.55	NS

TABLE 3: Total cholesterol, HDL cholesterol, LDL cholesterol in diabetic and controls above 45 years of age of male.

Parameters	Diabetic	Controls	Significance
Total cholesterol (mg/dl)	223.15 ± 27.15	225.00 ± 17.66	NS
HDL cholesterol (mg/dl)	46.90 ± 3.94	41.10 ± 1.67	S
LDL cholesterol (mg/dl)	152.25 ± 19.85	152.10 ± 18.19	NS

TABLE 4: Total cholesterol, HDL cholesterol, LDL cholesterol in diabetic and controls above 45 years of age of female.

Parameters	Diabetic	Controls	Significance
Total cholesterol (mg/dl)	211.20 ± 27.43	221.05 ± 12.46	NS
HDL cholesterol (mg/dl)	57.10 ± 2.21	52.00 ± 1.90	S
LDL cholesterol (mg/dl)	128.20 ± 22.07	134.60 ± 7.34	NS

Data presented are Mean ± SD (standard deviation)

NS: not significant ( $P > 0.05$ )

S: significant ( $P < 0.05$ )

## **DISCUSSION:**

In our study, both men and women, of age above 45 years, serum total cholesterol was found to be higher than in those below 45 years of age. In our study, the women below age group of 45 years were having significantly ( $p < 0.001$ ) lower serum total cholesterol level than men of same groups. Havel et al (1982) also had observed a sharp rise in the level of serum total cholesterol in women after the 5<sup>th</sup> decade of life (5). In diabetics patients, the mean total serum cholesterol concentration in men and women both are within normal limits. This observation is in accordance with those of Nikkils et al (1978), Eckel et al (1981), Harano Y et al (1996) also observed no high level of cholesterol in controlled diabetics.

In control male, HDL cholesterol level is the same in both age groups under study. But, in female, there was significant ( $p < 0.001$ ) increase in its serum level. A gonadotropin effect on HDL may be responsible for maintenance of HDL. HDL cholesterol level between diabetic persons are not altered in men and women of ages below and above 45 years. But it is lower in comparison to the respective age group of control and this is significant.

In our study LDL cholesterol in both sexes increased with ages. Male have higher LDL cholesterol level than female in both the age groups. The level of LDL cholesterol in diabetic was significantly same as in the normal in both sexes. Asayama K. et al also observed unaltered non-HDL cholesterol levels in diabetic patients. HDL cholesterol is known to have a protective role in formation of atherosclerosis also known as “Cardio protective cholesterol” (6,8). What is more disturbing is that in India, coronary artery disease occurs at a younger age group and the atheroma is more extensive.

## **CONCLUSION:**

Total cholesterol level is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic. HDL cholesterol level is significantly ( $p < 0.001$ ) lower in diabetic patients as compared to non diabetics. LDL cholesterol is not significantly ( $p > 0.05$ ) change in diabetic and non diabetic.

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