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Study on Gender Distribution of Altered Lipid Profile in Diabetics

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Abstract
Background*: Diabetes Mellitus is a complex condition with a high prevalence in society, and it is associated with complications that have high morbidity and mortality. Common pattern of dyslipidemia encountered in type 2 Diabetes Mellitus is characterized by high plasma triglyceride concentration, low HDL cholesterol concentration and increased concentration of small dense LDL-cholesterol particles. Type 2 DM may alter lipid profiles more adversely in women compared to men.*
Aim: *To study the gender distribution of dyslipidemia in patients with type 2 diabetes*
Results: Out of 100 cases, 60% of them were dyslipidemic. Majority of them had a diabetic dyslipidemic (25%) pattern followed by combined dyslipidemia (20%), isolated hypertriglyceridemia (6%), other patterns characterized by elevated levels of LDL with decreased HDL level (5%) and isolated lower HDL level (4%). Prevalence of dyslipidemia was more in males however prevalence and mean TG, LDL, TC,TC/HDL levels was more in females.
Conclusion: *Most prevalent pattern of dyslipidemia is diabetic dyslipidemic pattern. Gender alters the lipid profile in type 2 Diabetes Mellitus and females are associated with higher non HDL fraction.*
Keywords*: Dyslipidemia, Type 2 Diabetes Mellitus, Gender distribution*

I. Introduction

Lipid abnormalities in type 2 diabetes are characterized by high triglyceride concentrations, low high density lipoprotein-cholesterol concentrations, normal total and low density lipoprotein-cholesterol (LDL-c) concentrations[1-3].

Men and women with diabetes were found to have significantly lower concentrations of HDL-c than non-diabetic; the abnormalities in serum lipids were greater in diabetic women than men. These findings were confirmed in the much larger baseline studies from UKPDS in which the elevation of serum triglyceride and reduction in HDL-c were greater in female than male type 2

diabetic subjects compared with controls[4,5]. This may in part explain why the relative risk of developing CHD is greater in women than in men.

Ageing process may be among the factors that disturb lipid metabolism and is reflected thus in the high incidence of atherosclerosis in elderly people and hence puts elderly subjects at a higher risk of developing cerebrovascular or coronary heart diseases.

According to the report of World Health Organization (WHO), India tops the world with the largest number of diabetic subjects which is attributed to the rapid urbanization that is occurring in India along with associated epidemiological transition [6,7]. The burden of diabetes is to a large extent the consequence of macro vascular (coronary artery disease, peripheral vascular disease, and atherosclerosis) and micro vascular (like retinopathy, neuropathy, and nephropathy) complications of the disease [8]. Approximately 80% of deaths in diabetic patients are attributable to cardiovascular disease (CVD), which in turn is highly correlated with diabetic dyslipidemia [9].

The aim of this study is to find the correlation between various fractions of lipids like total cholesterol, triglycerides, HDL, LDL, VLDL in diabetics distributed according to gender within the population.

II. Materials and Methods

The study involved 100 patients with Type 2 Diabetes Mellitus meeting the inclusion and exclusion criteria. It is a cross-sectional study to find out the frequency of occurrence of dyslipidemia in Type 2 Diabetes Mellitus patients according to their age and gender.

Inclusion criteria

- Patients above the age of 40 years with type 2 diabetes mellitus.

Exclusion criteria

- Pregnant females
- Patients with previous history of coronary artery disease.
- Patients on weight loss program (last 4 week).
- Patients on steroids more than 14 consecutive days.
- Patients undergoing surgery within 30 days of visit.
- Patients with active liver or gall bladder disease.
- Patients with history of pancreatitis.
- Patients on statins.

Venous blood samples were collected for all patients and the following investigations were done:

- Fasting blood sugar
- Fasting lipid profile
- LDL cholesterol
- Triglycerides
- HDL cholesterol
- VLDL
- Total cholesterol
- Post Prandial blood sugar
- HbA1c

III. Results

Out of 100 patients included in the study, 57 were males and 43 were females. Age of the patients vary from 40 to 80 years. Maximum number (59%) of patients were seen in the age group of 40-60 years, rest of the patients in the 60-70 (34%) age group and remaining 7% in the > 70 age group.

The duration of diabetes varied from one year to 29 years. 30 (30%) had 5-10 years duration, 25 (25%) had 10-20 years duration, 21 (21%) patients had duration of 1-2 years, 20 (20%) had duration of 3-5 years, and 4 (4%) had diabetes mellitus for more than 20 years.

Dyslipidemia was found to be present in 60 (60%) diabetics among the 100 patients. Total cholesterol were found to be less than 200 mg/dl in 67(67%) patients, 200 -240 in 21(21%) of patients and >240 in 12%. Mean total cholesterol among males was 184.89 +/- 49.97 and females was 188.09 +/- 40.4 mg/dl.

The number of patients with total triglycerides <150 mg/dl was 52(52%), 150-199 mg/dl was 23 (23%), 200-499 mg/dl was 14(14%) and those with TG > 500 mg/dl was 11 (11%), mean TG levels in males was 160.28 +/- 66.03 mg/dl and in females was 162.77 +/- 56.47mg/dl.

High density lipoprotein levels below 40 mg/dl were seen in 34 (34%) patients, 65 patients have HDL between 40-60 mg/dl. 40 patients had LDL <100 mg/dl, 30 patients had between 100-130 mg/dl, 19 had between 130-160 mg/dl and 11 had > 160 mg/dl.

Very low density lipoprotein (VLDL) was found less than 30mg/dl in 49 patients and more than 30 mg/dl in 51 of the 100 patients.

The mean value of HDL, LDL, VLDL in males were 40.75+/-7.54 mg/dl , 114.86 +/- 41.33 mg/dl, 32.05+/-13.21 respectively and in females HDL was 38.86 +/- 5.78 mg/dl, LDL was 118.05 +/- 33.94 mg/dl and VLDL was 32.53 +/- 11.12 mg/dl.

IV. Discussion

Dyslipidemia remains an important association with Type 2 Diabetes Mellitus. It is a well known fact that diabetes mellitus carries a high risk for accelerated atherosclerosis and is associated with increased morbidity and mortality. Our study aimed to broaden the understanding of gender distribution of altered lipid profile amongst the diabetics.

Hypertriglyceridemia was seen in 48% of all patients while isolated hypertriglyceridemia alone was seen in 6% of the diabetics. Prevalence of hypertriglyceridemia was more in females (48.8%) than in males (43.9%). The mean values of triglyceride levels in females (162.77 mg/dl) were slightly higher than in males (160.28 mg/dl) .

Prevalence of low HDL was noted in 34% of the diabetics in the study with female preponderance.

Hypercholesterolemia was found to be present in 33% of diabetics with its prevalence higher in females (34.9%) than males (28.1%). The mean value in females was 188.09 mg/dl whereas in males it was 184 mg/dl.

In conclusion according to this study, the dyslipidemia in the male patients was found to be 61.4% and in females it was 58.13%.

Mean values of individual parameters like TG, TC, HDL, LDL and VLDL in females was 162.77mg/dl, 188.09mg/dl, 37.74mg/dl, 118.05mg/dl and 32.53 mg/dl respectively which were higher than in males. The TG, TC, HDL, LDL and VLDL mean values in males were 160.28 mg/dl, 184.89mg/dl, 37.75mg/dl, 114.86mg/dl and 32.05mg/dl correspondingly.

Therefore our study pointed to a higher prevalence of hypertriglyceridemia in females.

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