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A Study of Lipid Profile in Diabetes Mellitus type-2 Patients

Dr. Prem Kumar Arora[1], Dr. Devkant Sharma[2]

[1]Principal Specialist Medicine, Government Hospital Medicine, Sri Ganganagar

[2]Junior Specialist Medicine, Government Hospital Medicine, Sri Ganganagar

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Corresponding author: Dr Devkant Sharma
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Abstract

Background: Diabetes mellitus (DM) is a group of metabolic disease characterized by increase blood glucose level resulting from defects in insulin secretion, insulin action, or both.

Methods: This is a cross sectional case control study.100 patients of type 2 diabetes mellitus and 100 age and sex matched healthy controls were taken. Lipid profile were done in cases and controls using appropriate tests.

Results: Mean age in diabetic patients was 48.23± 9.24 years and control patients was 47.28± 9.84 years and age range was 20-70 years. The FBS levels in all the diabetics were significant ($p<0.05$) as compare to control. There was significant difference in mean HDL, Triglycerides level in diabetic and control patients ($p<0.05$) There was no significant difference in LDL, Cholesterol level in Diabetic and control patients ($p>0.05$).

Conclusion: We conclude that there is a high prevalence of elevated lipid and lipoprotein levels among the diabetic patients showing that they are more prone to these abnormalities,

Keywords: Diabetes Mellitus -2, Cholesterol, Lipid Profile

Introduction

Diabetes mellitus (DM) is the most common metabolic disorder affecting the people worldwide. Even though diabetes has been known since antiquity, only in the last few decades new discoveries have provided great hopes to minimize morbidity and mortality. [1]

Dyslipidemia is commonly seen in diabetes. Type 2 DM is one of the most common secondary causes of hyperlipidemia. The relationship between hyperlipidemia and vascular complication of diabetes has long been of interest because both tend to occur with greater frequency in Type 2 DM. Insulin resistance and obesity combine to cause dyslipidemia and hyperglycemia and hyperlipidemia have additive cardiovascular risk. Hence identification, critical evaluation, and followup of serum lipid profile in Type 2 DM continue to be important.[2]

The prevalence of dyslipidemia in diabetes mellitus is 95%.2 The dyslipidemia is a major risk factor for Coronary Heart Disease. The cardiovascular disease is a cause of morbidity and mortality in patients with diabetes mellitus because of disturbance in lipoproteins i.e. serum triglycerides (TC) 69%, serum cholesterol 56.6%, Low Density Lipoprotein cholesterol (LDL) 77% and High Density Lipoprotein cholesterol (HDL) 71%.[3]

Materials and Methods

From the patients admitted 100 representative cases of Type 2 DM are taken as subjects for the

study. Age and sex matches 100 non-diabetic are taken as controls. The diagnosis of diabetes is based on revised criteria according to consensus panel of experts from the National Diabetes Data Group and WHO.

Inclusion Criteria

Patients of Type 2 DM .

Exclusion Criteria

Type 2 diabetes patients with concomitant diseases or condition affecting the lipid levels such as hypothyroidism, on lipostatic drugs, and thiazides.

Method of data collection

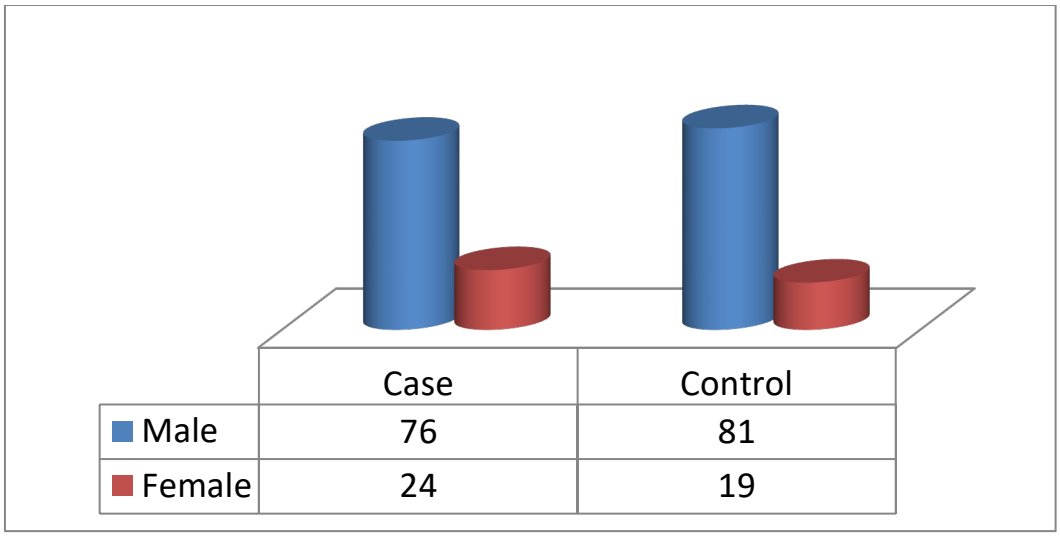
- The blood sample of diabetes patients including controls group was taken after fasting for 10-12 hours.
- 5-10ml of venous blood was drawn from the anticubital vein by aseptic technique in plain vial.
- Serum was separated from the collected sample for biochemical analysis. Lipid profile investigations that included serum cholesterol, triglyceride, High density lipoprotein cholesterol (HDLcholesterol) and Low density lipoprotein cholesterol (LDL-cholesterol) were carried out on a semi automated analyzer using standard kits.

Lipid profile measured following methods

- Serum total cholesterol: was measured by Enzymatic method Normal serum cholesterol: 150-250 mg/dl
- Serum HDL cholesterol: was measured by "Phosphotungstate method. Normal HDL – Cholesterol: 30 – 70 mg/dl.
- Serum LDL cholesterol: If the value of Triglycerides is known, LDL-cholesterol can be calculated based on Friedewald"s equation.
- Serum Triglycerides: was measured by enzymatic colorimetric method Normal Serum Triglycerides: Male: 60-165 mg/dl Female: 40-140 mg/dl.

Results

This was a cross sectional, case control, hospital based study on 100 type 2 diabetes mellitus patients attending in OPD with equal number of age and sex matched controls. Mean age in diabetic patients was 46.38± 10.02 years and control patients was 47.02± 10.21 years and age range was 20-70 years.



Graph 1:

Table 1: Comparison of biochemical parameters in case and controls.

Parameters	Case (n=100)	Control (n=100)	p-value
Mean Total cholesterol	162.82 ± 40.80	158.20 ± 27.61	>0.05
Mean LDL	92.68 ± 27.82	91.86± 29.62	>0.05
Mean HDL	33.68 ± 8.86	51.78± 9.82	<0.05
Mean Triglycerides	180.20± 61.20	137.50 ± 23.20	<0.05

There was significant difference in mean HDL, Triglycerides level in diabetic and control patients ($p<0.05$)
There was no significant difference in LDL, Cholesterol level in Diabetic and control patients ($p>0.05$).

Discussion

Mean age in diabetic patients was 46.38± 10.02 years and control patients was 47.02± 10.21 years and age range was 20-70 years. These values were similar to those reported by Kumar et al [4].

In our study the FBS levels in all the diabetics were significant ($p<0.05$) as compare to control similar result were observed by Bhalla Kapil et al.[5]

This study also demonstrates the typical diabetic dyslipidemia which is characterized by low HDL, high triglyceride. Various national and international epidemiological studies on lipid profile have also shown this pattern of dyslipidemia.[6-7]

No significant difference was observed in total cholesterol and absolute LDL levels in cases and controls in this study. Even if the absolute concentration of LDL cholesterol is not significantly increased; there is typically a preponderance of smaller, denser LDL particles, which possibly increases atherogenicity (atherogenic dyslipedemia).These changes are due to increased free fatty acid flux secondary to insulin resistance.[8]

Conclusion

We conclude that there is a high prevalence of high degree of elevated lipid and lipoprotein levels among the diabetic patients showing that they are more prone to these abnormalities

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