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

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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 was done in cases and controls using appropriate tests.

Results: Mean age in diabetic patients was 48.03± 9.21years and control patients was 47.22± 9.79 years and age range was 40-70 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 a group of metabolic disease characterized by increase blood glucose level resulting from defects in insulin secretion, insulin action, or both[1]. The chronic hyperglycemia of diabetes is associated with longterm damage, dysfunction and disturbance in failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels[2] . Patients with type-2 diabetes have increased risk of cardiovascular disease associated with atherogenic abnormalities and dyslipidaemia. Coronary artery disease, especially myocardial infarction is the leading cause of morbidity and mortality worldwide[3]. Hyperglycaemia andatherosclerosis are related in type-2 diabetes

Persistent hyperglycaemia causes glycosylation of all proteins, especially collagen cross linking and matrix proteins of arterial wall. This eventually causes endothelial cell dysfunction, contributing to atherosclerosis.[5]Lipid abnormalities associated with diabetes are termed as dyslipidaemia rather than hyperlipidaemia because there may be changes in both

quantity and quality of the lipoproteins. Diabetes mellitus (DM) is a common secondary cause of hyperlipidaemia, particularly, if glycaemic control is poor, which in-turn is an important risk factor for atherosclerosis and coronary heart disease.[6]

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-diabetics 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

- A detailed history and careful physical examination.
- 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

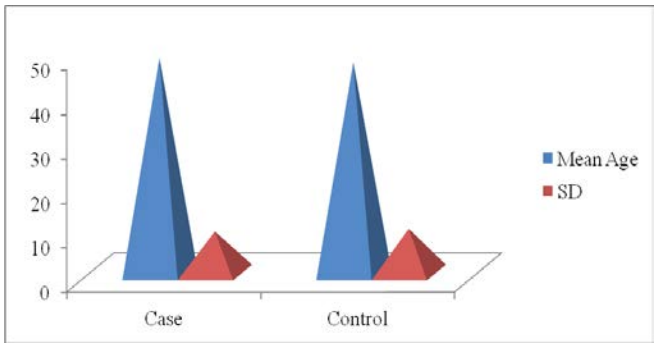
- Serum total cholesterol: was measured by Enzymatic method Normal serum cholesterol: 150-250 mg/dl
- Serum HDL cholesterol: was measured by "Phosphotungstate method. Normal HDL – Cholesterol: 30 – 70 mg/dl.
- Serum LDL cholesterol: If the value of Triglycerides is known, LDL-cholesterol can be calculated 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.

Statistical Analysis

The mean levels of various fractions were correlated with basal reference values for normal individuals. Relevant statistical methods like "Z significant test" (The manual of statistical methods for use in health and nutrition) were used to see the significance of deference in mean values between groups and to know the correlation between inter and intergroup variations.

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 48.03± 9.21years and control patients was 47.22± 9.79 years and age range was 40-70 years.

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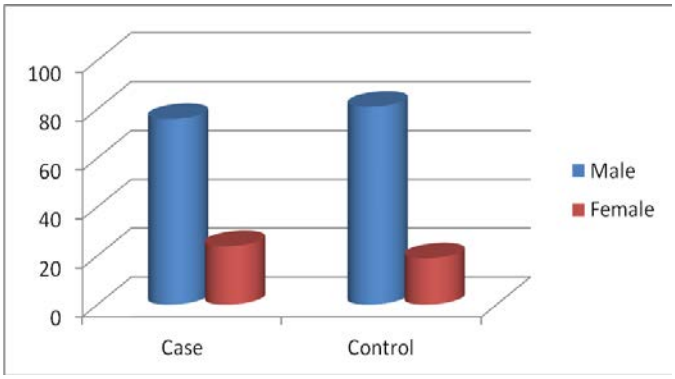

Table 1: Comparision of Blood sugar in case and controls.

	Case (n=100)	Control (n=100)	p-value
FBS(Mean ± SD)	168.52± 41.23	86.32 ± 15.32	<0.05

The FBS levels in all the diabetics were significant higher (p<0.05) as compare to control.

Table 2 : Comparision of Hb1Ac in case and controls.

	Case (n=100)	Control (n=100)	p-value
Hb1Ac (Mean ± SD)	8.23± 2.1	4.21 ± 1.98	<0.05

The FBS levels in all the diabetics were significant higher (p<0.05) as compare to control.

Table 3 : Comparision of biochemical parameters in case and controls.

Parameters	Case (n=100)	Control (n=100)	p-value
Mean Total cholesterol	163.2± 40.76	157.23 ± 27.10	>0.05
Mean LDL	92.10 ± 27.82	91.56± 29.62	>0.05
Mean HDL	33.26 ± 8.86	51.76± 9.82	<0.05
Mean Triglycerides	178.56± 58.23	136.25 ± 23.14	<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).

Table 4: Incidence of various complications

Complication	No of patients(n=100)	Percentage
Retinopathy	43	43.00
Neuropathy	33	33.00
Nephropathy	13	13.00
IHD	11	11.00
Stroke	9	9.00

In this study, retinopathy was the most common complications followed by neuropathy. Retinopathy was seen in 43.00% of the study group.

Discussion

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. These values were similar to those reported by Kumar et al [6].

In our study the FBS levels in all the diabetics were significant (p<0.05) as compare to control similar result were observed by BhallaKapil et al.[7]

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.[8-9]

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

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changes are due to increased free fatty acid flux secondary to insulin resistance.[10]

In this study, retinopathy was the most common complications followed by neuropathy. Retinopathy was seen in 43.00 % of the study group. According to the American diabetic association, at the 10 and 15 years the diabetic retinopathy was 58% and 18%, respectively. [11]

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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