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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 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 one of the most challenging public health problems in 21st century. There is an urgency for greater action to improve diabetes outcomes and reduce the global burden of diabetes now affecting more than 425 million people, of which one-third are people older than 65 years. The estimates of children and adolescents below age 19 with type 1 diabetes has risen to over a million. If nothing is done, the number of people with diabetes may rise to 693 million in 2045, although positively the incidence has started to drop in some high income countries.[2] At the same time, a further 352 million people with impaired glucose tolerance are at high risk of developing diabetes. By the end of this year, 4 million deaths will happen as a result of diabetes and its complications. [3] Alongside other noncommunicable diseases, diabetes is increasing most markedly in the cities of low and

middle income countries. The IDF South-East Asia and Western Pacific regions are at the epicentre of the diabetes crisis: China alone has 121 million people with diabetes and India's diabetes population totals 74 million. African, Middle Eastern and Northern African and South-East Asian regions are expected to face the highest upsurge in the next 28 years. People from these regions develop disease earlier, get sicker and die sooner than their counterparts in wealthier nations.[4-5]

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

Table 1: Socio-demography

	Case (n=100)	Control (n=100)	p-value
Age	51.2± 6.32	52.31± 6.54	<0.05
Sex(M:F)	56:44	55:45	<0.05

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 51.2± 6.32 years and control patients was 52.31± 6.54 years and age range was 20-70 years.

Table 2: Comparision of Blood sugar in case and controls.

	Case (n=100)	Control (n=100)	p-value
FBS	168.23 ± 32.1	91.23 ± 10.23	<0.05
HB1Ac	8.23 ± 0.65	5.1 ± 0.46	<0.05

The FBS & Hb1Ac levels in all the diabetics were significant (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 ± 38.23	156.32 ± 27.64	>0.05
Mean LDL	91.56 ± 27.4	91.42± 29.12	>0.05
Mean HDL	33.68 ± 8.86	51.78± 9.82	<0.05
Mean Triglycerides	178.23± 61.18	136.23 ± 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 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 changes are due to increased free fatty acid flux secondary to insulin resistance.[9]

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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