Research Article

A STUDY OF LIPID PROFILE IN DIABETES MELLITUS AT TERTIARY CARE CENTER JODHPUR

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A R T I C L E   I N F O

A B S T R A C T

Backgroud- Diabetes Mellitus (DM) is a group of metabolic diseases 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. 50 patients of type 2 diabetes mellitus and 50 age and sex matched healthy controls were taken after obtaining written and informed consent from them. HbA1c and Lipid profile were done in cases and controls using appropriate tests. The data was analyzed with SPSS version 22.0. The mean, SD, independent t test and correlation (Pearson's) test were used to interpret the results.

Results- There was highly significant difference in mean HDL in diabetic and control patients (p<0.001). There was highly significant difference in mean FBS, HbA1c and Triglycerides in diabetic and control patients (p<0.001).

Conclusion-Early screening of diabetic patients for dyslipidemia and early intervention is required to minimize the risk of future cardiovascular mortality.

INTRODUCTION

Diabetes Mellitus (DM) is a group of metabolic diseases characterized by increase blood glucose level resulting from defects in insulin secretion, insulin action, or both.[1] The prevalence of diabetes is on the rise, more alarmingly in the developing nations. The number of diabetic patients in the world has been estimated more than 175 million. Diabetes mellitus is ranked 7th among leading causes of death & has been rated 3rd when all its fatal complications are taken in to account. Patients with type2 diabetes have increased risk of cardiovascular disease associated with atherogenic dyslipidemia. Coronary artery disease, especially myocardial infarction is the leading cause of morbidity and mortality worldwide.[2] Hyperglycemia and atherosclerosis are related in type-2 diabetes.[3] Besides multiplying the risks of coronary artery diseases, diabetes enhances incidences of cerebrovascular strokes. Moreover, it is the leading cause of acquired blindness & accounts for more than 25% cases with end stage renal diseases as well as 50 % non-traumatic lower limb amputations.

Dyslipidemia is commonly seen 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.

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Insulin resistance and obesity combine to cause dyslipidemia and hyperglycemia and hyperlipidemia have additive cardiovascular risk. It is recommended that patients with DM should be treated as if they already have coronary artery disease[4].

MATERIALS AND METHODS

From the patients admitted 50 representative cases with H/O Type 2 DM are taken as subjects for the study. Age and sex matches 50 nondiabetic 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

1. Patients with Type 2 DM of more than 40 years
2. Duration of diabetes more than 4 years.

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
- Routine blood and urine examination
- Biochemical analysis for fasting blood sugar (FBS) and post prandial blood sugar (PPBS)
- Fasting serum triglycerides (TGs)
- Total cholesterol (TC)

- High-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C).

The blood sample of diabetes patients including controls group was taken after fasting for 10-12 hours. 7-10ml 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. Statistical analysis was done using SPSS software (version 22). T-test was used for the comparison of two groups. P-value of <0.05 was considered statistically significant and a p-value of <0.001 was considered to be highly significant.

Lipid profile measured following methods

1. Serum total cholesterol: was measured by Enzymatic method Normal serum cholesterol: 150-250 mg/dl
2. Serum HDL cholesterol: was measured by "Phosphotungstate method. Normal HDL – Cholesterol: 30 – 70 mg/dl.
3. Serum LDL cholesterol: If the value of Triglycerides is known, LDL-cholesterol can be calculated based on Friedewald"s equation. LDL – chol mg/dl: Total CHOL – TRIGLYCERIDES – HDL – CHOL 5
4. 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 50 type 2 diabetes mellitus patients attending in OPD/IPD with equal number of age and sex matched controls.

Mean age in diabetic patients was 52.14± 8.96 years and control patients was 50.30± 10.26 years and age range was 24-80 years. Both groups were well matched for age and sex distribution.
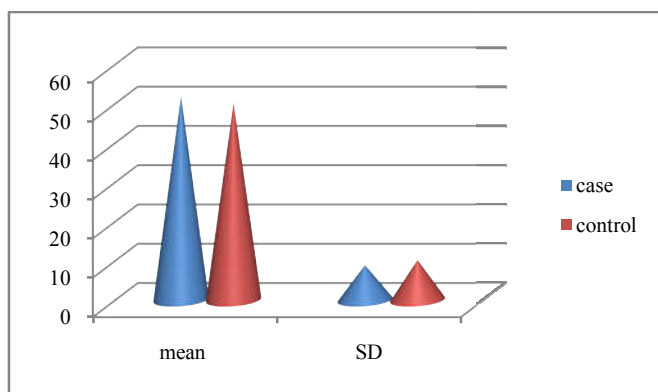

Fig 1 Age wise distribution of case and control

Table 1 Comparision of biochemical parameters in case and controls.

Parameters	Case (n=50)	Control (n=50)	p-value
FBS	202.02 ± 71.80	88.50 ± 7.56	<0.001
Mean HbA1c	8.90 ± 1.81	5.34± 0.40	<0.001
Mean Total cholesterol	164.32 ± 46.20	162.50 ± 32.10	>0.05
Mean LDL	91.50 ± 32.20	92.40± 31.80	>0.05
Mean HDL	38.42 ± 11.24	52.36± 12.58	<0.001
Mean Triglycerides	182.72 ± 72.84	124.32 ± 18.56	<0.001

There was highly significant difference in mean HDL in diabetic and control patients (p<0.001). There was highly significant difference in mean FBS, HbA1c and Triglycerides in diabetic and control patients (p<0.001).

DISCUSSION

Mean age in diabetic patients was 52.14± 8.96 years and control patients was 50.30± 10.26 years and age range was 24-80 years. Both groups were well matched for age and sex distribution in our study.These values were similar to those reported by Kumar *et al* [5].

This study also demonstrates the typical diabetic dyslipidemia which is characterized by low HDL, high triglyceride (Table 1). 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 (LDL-c) 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

Early screening of diabetic patients for dyslipidemia and early intervention is required to minimize the risk of future cardiovascular mortality.

References

1. Goldberg IJ. Diabetic Dyslipidemia. Statins versus Fibrates in the Treatment of Diabetic Dyslipidemia. Symposium. Program and Abstracts of the 61st Scientific Session of the American Diabetes Association; 2001.
2. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 2005; 28: 37-42.
3. Haffner SM. Lipoprotein disorders associated with type 2 diabetes mellitus and insulin resistance. *Am J Cardiol*. 2002; 90: 55-61.
4. Goldberg IJ. Clinical review 124: Diabetic dyslipidemia: causes and consequences. *J Clin Endocrinol Metab*. 2001; 86: 965-971.
5. Kumar A, Kulshrestha M, TripathiA, Sharma M and Kartikeya. A study of correlation between carotid intima - media thickness and diastolic dysfunction in asymptomatic type 2 Diabetics. *IJCMR*. 2016; 3:1458-1460.
6. Krauss RM. Lipids and lipoproteins in patients with type 2 diabetes. *Diabetes Care*. 2004; 27:1496-504.
7. Witztum JL, Steinberg D. Role of oxidized low density lipoprotein in atherogenesis. *J Clin Invest*. 1991; 88:1785-92.
8. UK Prospective Diabetes Study (UKPDS) Group. Intensive blood-glucose control with sulphonylureas or insulin compared with conventional treatment and risk of complications in patients with type 2 diabetes (UKPDS 33). *Lancet*. 1998; 352:837-853.