



ORIGINAL RESEARCH PAPER

General Medicine

A STUDY OF LIPID PROFILE IN NON-INSULIN DEPENDENT DIABETES MELLITUS

KEY WORDS: Diabetes mellitus & Lipid profile

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ABSTRACT

Introduction: Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycaemia. Several distinct types of DM are caused by a complex interaction of genetics and environmental factors. Depending on the aetiology of the DM, factors contributing to hyperglycaemia include reduced insulin secretion, decreased glucose utilization, and increased glucose production. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system. In India, DM is the leading cause of end-stage renal disease (ESRD), nontraumatic lower extremity amputations, and adult blindness. It also predisposes to cardiovascular diseases. With an increasing incidence worldwide, DM will be likely a leading cause of morbidity and mortality in the future.

Methodology: This study conducted in medicine Dept. of C U Shah medical college, Surendranagar on patients (selected on basis of inclusion and exclusion criteria's). This study conducted between February 2018 to September 2019. This study was done after approval of THE INSTITUTIONAL ETHICS COMMITTEE (HUMAN RESEARCH) of C U Shah medical college, Surendranagar.

Result: There is significant correlation between triglyceride level and diabetes mellitus. 60% of diabetic patients have more than optimal levels.

Conclusion: Dyslipidemia are highly prevalent in diabetic patients particularly more in poorly controlled diabetes. Lipid profile should be done annually in all diabetic patient. Out of 100 patients 34 have high LDL/HDL ratio which was proved statistically significant.

INTRODUCTION

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. Several distinct types of DM are caused by a complex interaction of genetics and environmental factors. Depending on the etiology of the DM, factors contributing to hyperglycemia include reduced insulin secretion, decreased glucose utilization, and increased glucose production. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system. In India, DM is the leading cause of end-stage renal disease (ESRD), nontraumatic lower extremity amputations, and adult blindness. It also predisposes to cardiovascular diseases. With an increasing incidence worldwide, DM will be likely a leading cause of morbidity and mortality in the future.^(1,2)

The worldwide prevalence of DM has risen dramatically over the past two decades, from an estimated 30 million cases in 1985 to 382 million in 2013. Based on current trends, the International Diabetes Federation projects that 592 million individuals will have diabetes by the year 2035. Although the prevalence of both type 1 and type 2 DM is increasing worldwide, the prevalence of type 2 DM is rising much more rapidly, presumably because of increasing obesity, reduced activity levels as countries become more industrialized, and the aging of the population. In 2013, the prevalence of diabetes in individuals from age 20–79 ranged from 23 to 37% in the 10 countries with the highest prevalence.

The countries with the greatest number of individuals with

diabetes in 2013 are China (98.4million), India (65.1 million), United States (24.4 million), Brazil (11.9 million), and the Russian Federation (10.9 million). Up to 80% of individuals with diabetes live in low-income or medium-income countries.^(3,4)

The CDC estimated that the incidence and prevalence of diabetes doubled from 1990–2008, but appears to have plateaued from 2008–2012. DM increases with age.

Diabetic patients have a greater likelihood of having dyslipidemia, hypertension, and obesity. Because early detection and prompt treatment may reduce the burden of diabetes and its complications, screening for diabetes may be appropriate under certain circumstances. Epidemiological studies have demonstrated that type 2 diabetes mellitus (DM) is a well-known risk factor for the development of cardiovascular disease, cerebrovascular disease and peripheral vascular diseases. Dyslipidemia is a risk factor for coronary artery disease, a leading cause of mortality in patients with diabetes mellitus. Dyslipidemia remains largely undiagnosed and under treated in high risk populations, such as patient with type- 2 diabetes.^(5,6)

A characteristic pattern, termed diabetic dyslipidemia, consists of specifically mild to marked elevation of triglyceride-rich lipoproteins (VLDLs) and VLDL remnants concentrations and low levels of HDL-C. Raised serum triglycerides and low HDL-C often precede the onset of T2DM for many years. In addition, LDL particles are converted to smaller, perhaps more atherogenic, lipoproteins termed 'small-dense LDLs'. Different mechanisms are responsible for

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the development of dyslipidemia in individuals with diabetes. Defects in insulin action and hyperglycemia could lead to dyslipidemia in patients with diabetes. In the case of T2DM, the obesity/insulinresistant state that is at the basis of the development of this disease can in itself lead to lipid abnormalities independently of hyperglycemia. In poorly controlled T1DM hypertriglyceridemia and reduced HDL-C commonly occur, but in most cases insulin replacement in these patients correct these abnormalities. In T2DM, this phenotype is not usually fully corrected with glycemic control, suggesting that insulin resistance and not hyperglycemia per se are associated with this lipid abnormality. Insulin-controlled apoprotein production in the liver, regulation of lipoprotein lipase (LPL), actions of cholesteryl ester transfer protein (CETP) and peripheral actions of insulin on adipose tissue and muscles are considered to be important mechanisms responsible for diabetic dyslipidemia.⁽⁷⁾

METHODOLOGY

This study conducted in medicine Dept. of C U Shah medical college, Surendranagar on patients (selected on basis of inclusion and exclusion criteria's). This study conducted between February 2018 to September 2019. This study was done after approval of THE INSTITUTIONAL ETHICS COMMITTEE (HUMAN RESEARCH) of C U Shah medical college, Surendranagar. A cross sectional study of 100 type 2 diabetic patients. The participants were already diagnosed as type 2 diabetics and undergoing treatment.

A written informed consent form was completed by all the participants who were recruited into the study. The purpose of the study was explained to the participants in English and local language as they understand. Detail history and physical examinations was conducted.

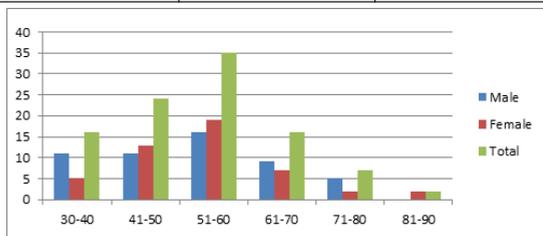
Information on clinical features and anthropometric measurements were taken.

Following investigation was done;
Complete hemogram including Total count, platelet count, Hemoglobin S.creatinine, S.electrolytes, Urine routine microbiological examination, Fasting blood sugar and post-prandial Blood sugar, HbA1C, S.TSH, Lipid profile.

RESULTS

Table 1: Age & Sex wise distributions

AGE	NUMBER OF PATIENTS	
	MALE	FEMALE
30-40	11	5
41-50	11	13
51-60	16	19
61-70	9	7
71-80	5	2
81-90	0	2



In this study most common affected age group are 51 to 60 year (35%) followed by 41 to 50 (24%)

Table 2: Clinical feature

CLINICAL FEATURES	NUMBER OF PATIENTS	
	MALE	FEMALE
POLYUREA	11	10

POLYPHAGIA	7	4
POLYDIPSIA	2	7
TINGLING & NUMBNESS	13	12
SLOW HEALING ULCER	5	4
FREQUENT INFECTION	11	5
BLURRING OF VISION	7	5

In present study Tingling & numbness is most common clinical symptom followed by polyurea.

Table:3 S.CHOLESTROL

CHOLESTROL (mg/dL)	NUMBER OF PATIENTS	
	MALE	FEMALE
<160 (optimal)	15	14
160-199 (near or above optimal)	17	10
200-239 (borderline)	4	5
240-279 (high)	11	10
>280 (above high)	5	9

This table is showing distributions of S.CHOLESTROL in type 2 diabetes mellitus patients.

In my study around 21 patients (11 male and 10 female) having s.cholesterol between 240-279 (HIGH) and 14 patients (5 male and 9 female) having s.cholesterol more than 280 (ABOVE HIGH)

Table 4:S. TRIGLYCERIDE

TRIGLYCERIDE (mg/dL)	NUMBER OF PATIENTS	
	MALE	FEMALE
<150 (optimal)	23	17
150-169 (near or above optimal)	9	14
170-199 (borderline)	7	7
200-499 (high)	12	10
>500 (above high)	1	0

This table is showing distributions of S.TRYGLYCERIDE in type 2 diabetes mellitus patients.

In my study around 22 patients (12 male and 10 female) have s.tryglyceride level between 200-499 mg/dL (HIGH) and 1 male patients having s.tryglyceride level more than 500 mg/dL.

Table 5:S.HDL

HDL (mg/dL)	NUMBER OF PATIENTS	
	MALE	FEMALE
<40 (low)	33	31
40-49 (borderline)	11	9
50-59 near or below optimal)	5	4
>60 (optimal)	3	4

This table is showing distributions of S.HDL in type 2 diabetes mellitus patients.

In my study around 20 patients (11 male and 9 female) having S.HDL level between 40-49 mg/dL (BORDERLINE) and 64 patients (33 male and 31 female) having S.HDL level below 40 mg/dL (LOW).

Table 6:S.LDL

LDL (mg/dL)	NUMBER OF PATIENTS	
	MALE	FEMALE
<100 (optimal)	21	20
100-129(near or above optimal)	14	14
130-159 (borderline)	10	6
160-189 (high)	5	6
>190 (very high)	2	2

This table is showing distributions of S.CHOLESTROL in type 2 diabetes mellitus patients.

In my study around 17 patients (10 male and 6 female) have S.LDL level between 130-159 mg/dL (BORDERLINE) , 11 patients (5 male and 6 female) having S.LDL between 160-189 mg/dL (HIGH) and 4 patients (2 male and 2 female) having S.LDL more than 190 mg/dL (VERY HIGH).

Table 7: LDL/HDL RATIO

LDL/HDL RATIO	NUMBER OF PATIENTS	
	MALE	FEMALE
<1.6 (optimal)	3	3
1.6-2.7 (near borderline)	17	18
2.7-3.7 (borderline)	15	10
3.7-4.7 (high)	9	6
>4.7 (v. high)	8	11

This table showing distribution of patients according to LDL/HDL ratio.

In my study around 25 patients (15 male and 10 female) have LDL/HDL ratio between 2.7-3.7 (borderline).

15 patients (9 male and 6 female) have LDL/HDL ratio between 3.7-4.7 (high).

19 patients (8 male and 11 female) have LDL/HDL ratio above 4.7 (v.high).

DISCUSSION

There is significant correlation between triglyceride level and diabetes mellitus. 60% of diabetic patients have more than optimal levels which is similar to Chat of Haffner s m, K & Lassko M study . There is 64% patients have S.HDL level less than optimal which is similar to Ronnema T, study on relation between lipids and diabetes ⁽⁸⁾ 32% of study group patients have S.LDL levels more than optimal range with 11% with high level which similar to Lehto S., Pyorala K study on relation between lipids and diabetes. Out of 100 patients 34 have high LDL/HDL ratio which was proved statistically significant. This study showed similar results to to Lehto S., Pyorala K study on relation between lipids and diabetes. ⁽⁸⁾

CONCLUSION

The present study highlights the magnitude of dyslipidemia in type 2 diabetes mellitus patients and that there is a significant association of TYPE 2 diabetes mellitus. Dyslipidemia are highly prevalent in diabetic patients particularly more in poorly controlled diabetes. This is mostly seen in patient having high calorie diet, physical inactivity, high stress level and habit od smoking and alcohol. Lipid profile should be done annually in all diabetic patients.

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