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EVALUATION OF LIPID PROFILE IN TYPE2 DIABETES MELLITUS PATIENTS IN A CIVIL HOSPITAL DHULE, NORTH MAHARASHTRA

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ABSTRACT

***Aim & Objective**: The study was planned to evaluate the lipid profile in type2 diabetes mellitus patients. The prevalence of coronary artery diseases is 4 to 6 times higher in both male and female diabetic patients compared to general people. Individuals with diabetes may have several forms of dyslipidemia leading to the preservative cardiovascular risk of hyperglycemia. Diabetes mellitus refers to a group of common metabolic disorders. This study was therefore conducted to recognize the levels of lipid in the Type2 diabetic patients in Dhule (ms). To study the pattern of lipid profile in type2 diabetes mellitus patients. Setting: the study was conducted at SBHGM College.Civil Hospital in Dhule MS. **Research design and Methods:** A prospective, Open-label and randomized control study were conducted with 200 type 2 diabetes patients with a glycosylated haemoglobin of higher than 7.5%. they were. To study the pattern of lipid profile in type 2 diabetes mellitus, 200 cases of type 2 Diabetes Mellitus presence in the civil hospital were selected. The result was compared with 50 healthy, non-obese, non-diabetic and non-hypertensive subjects. **Results:** Triglyceride and very low-density lipoprotein were significantly higher where high-density lipoprotein levels lower in diabetics than healthy controls. Total cholesterol and low-density lipoprotein be other fractions which were a little above optimal level in diabetics. The total cholesterol is high in 70.5% among the who were diabetic. Normal Among the control, i.e. non-diabetic patients, 29.5% of them had total cholesterol in the normal range and high cholesterol levels were observed in only 70.5% of them. The levels of triglycerides and LDL were significantly elevated in 71.5%, and 83.5% of the patients with type2diabetes, compared to the non-diabetic patients. HDL in these patients was significantly small. **Conclusions:** The incidence of aroused lipid levels in the diabetic patients is very high and since the high levels of lipids especially in these patients can lead to CHD and its complications, it is important for the monitoring of these levels during the course of the disease. As of our study, it was accomplished that diabetes mellitus has a real impact on lipid metabolism. It is concluded from the results of the present study so as to in type 2 diabetics dyslipidaemia was very common especially raised LDL levels, high Triglycerides levels were higher in the diabetic group. This is directly affecting on quality of life, health-related quality of life in Type2 Diabetes mellitus patients.*

KEY WORDS

Lipid profile, Coronary heart disease, Type2 Diabetes mellitus, Serum cholesterol, Serum triglyceride, Serum LDL, Pharmaceutical care program.

INTRODUCTION:

Diabetes mellitus concerns to a group of widespread metabolic disorders that split the phenotype of hyperglycemia. Type 2 Diabetes Mellitus (DM) is a heterogeneous group of disorders characterized by a variable degree of insulin resistance, impaired insulin secretion, and increased glucose production.[1] The global burden of DM is enormous with an estimated 366 million people living with DM worldwide (2011).[2] India accounted for nearly one-sixth of global diabetes burden in 2011 with about 62 million of the community affected by diabetes which is expected to go up to 101 million by 2030. [2, 3] Type2 DM is the most prevalent form of DM seen in India and constitutes more than 95% of diabetes population. Prevalence of diabetes is resting on a boost in India. According to National Urban Diabetes Survey (NUDS), the age-standardized prevalence of diabetes and IGT were 12.1% and 14% respectively with no gender difference and that prevalence of diabetes is uniformly high in all urban cities of India (Chennai 13.5%, Bangalore 12.4%, Hyderabad 16.6%, Calcutta 11.7%, Mumbai 9.3%, and New Delhi 11.6%) but higher in north zone. [4] It has been observed that Type2 DM in India occurs a decade earlier than in the developed world as shown by NUDS, Daryaganj survey, and CURE study, though the prevalence peaks at an older age. [4,5,6] The metabolic abnormality to commonly escort diabetes is turbulence in the production and clearance of plasma lipoproteins. In India, the prevalence of dyslipidemia is 86.5% in male Type2 DM and 97.8% in female Type2 DM. [7] Individual with DM may have several forms of dyslipidemia. Because of the additive cardiovascular risk of hyperglycemia and hyperlipidemia.

The most frequent example of dyslipidemia is hypertriglyceridemia and reduced HDL cholesterol levels. DM itself does not increase levels of LDL, but the small dense LDL particles found in Type2 DM are more atherogenic since they are more easily glycated and susceptible to oxidation. [8] The aim of the present study is to examine the pattern of lipid profile in type 2 diabetes mellitus in Dhule in north Maharashtra. Diabetes mellitus is a chronic disease state characterized by hyperglycemia, that is related to high morbidity and mortality from its complications which if uncontrolled leads to various short terms and long-term complications. Diabetes mellitus with its related complications such as cardiovascular diseases, retinopathy, nephropathy, and neuropathy is a serious health problem. [1,2,9] Type 2 Diabetes mellitus account for 90-95% of those with Diabetes mellitus The prevalence rate of Type 2 Diabetes mellitus is high in India and is expected to rise. This rise is due to low literacy rate, lack of public awareness, lack of advanced healthcare facilities and sedentary lifestyle. [3,4,10] in this study also the high prevalence rate of type2 diabetes in Dhule Maharashtra due to low literacy rate, lack of public awareness, lack of advanced healthcare facilities and an inactive lifestyle. The basis of this study was to detect the lipid abnormality in diabetic patients. The aim of the present study is to evaluate the pattern of lipid profile in type 2 diabetes mellitus in Dhule.

METHODS

Study design: The study was a prospective, open-label and randomized control. It was conducted at SBHGM college. Civil hospital in Dhule Maharashtra. Total two hundred patients of Type2 diabetes Mellitus were selected from the outdoor patient department. 50 normal healthy volunteers between the age group of 40-70 years were selected for control study.

Study population:

A total of 200 Type 2 diabetic patients were enrolled in the study, on the basis of inclusion & exclusion criteria after getting approval from the Institutional Human Ethics Committee of SBHGM College. Civil hospital in Dhule Maharashtra. Patients were included into to the study if Patients with type 2 diabetes mellitus of either sex, Patients with age more than 40 yrs, Patients with HbA1c more than 7.7% and Patients with blood sugar level more than 150 mg/dl. Patients were excluded from the study if Patient with end-stage kidney disease, Patient with heart failure, with chronic Diabetes problem and orthopaedic problem, Pregnant women with type 2 diabetes. 50 normal healthy volunteers between the age group of 40-70 years were selected for control study.

Ethical Clearance:

The procedure of study approved from Institutional Human Ethical Committee of SBHMG civil hospital Dhule Maharashtra. Clearance was obtained from the Ethical Committee. The study aim & objectives were explained to the patients and informed written consent was obtained in local language from them before the data collection.

Data and statistical analysis:

The feature history was taken the related clinical examination and all routine investigations are performed. Informed consent is in use from every patient after complete clarification of procedure. The identified cases of type 2 diabetes mellitus resolve as well be evaluated for their blood sugar (control or un-control) by advising the HbA1C level. Data Collection: The following data of each patient were recorded in the patient data collection forms (Patient Proforma). The data were entered into a Microsoft Excel Spreadsheet, after data cleanout the data were transported into SPSS. Statistical Package for the Social Sciences-version 1.6 package software program for statistical analysis.[13]Descriptive statistics (numbers and percentage) were calculated for all variables, as well as investigative statistics was finished to find the relations between variables.

RESULTS:

A total of 200 patients were involved in the study. With type2diabetes case. 50 normal healthy volunteers between the age group of 40-70 years were selected for the control group. Out of 200 patients, male 123 (61.5%), female 77(38.5%).in Fig1. The subsequent observations are of a case-control study of 200 type2diabetic subjects and 50 controls where variations in lipid levels are evaluated among the two populations. The Fasting plasma glucose, Postprandial glucose, Glycosylated haemoglobin (%) and body mass index was high 210.07±42.13mg/dl, 253.50±44.62, 9.39±10.23 and 26.0±3.0 in diabetic group as compared to control. The evaluation of clinical parameters in two groups of patients shown in (Table 1). Where variations in lipid levels are evaluated among the two populations. Among Type 2 DM case group the triglyceride (203.14±36.88mg/dl) were highly raised while HDL was low (37.62±4.96mg/dl). Total cholesterol (174.40±27.87mg/dl) and LDL (125.82±34.63mg/dl) was slightly raised. These values were statistically highly significant when compared to the control group (P<0.001) shown in (Table 2). In the type 2 DM patients (70.5%) showed high serum cholesterol level. In the control group, all persons boast normal serum cholesterol level shown in (Table 3) in fig 2. In the type 2 DM patients (71.5%) showed high serum triglyceride level. As compared to the control group. Shown in (Table 4). Serum LDL level was high (>160 mg/dl) in 83.5% of type 2 DM patients. Normal in a control group. shown in (Table 5). In the type 2 DM serum HDL value low down in 73.5%. shown in (Table 6). In type 2 DM patients, both the sexes have shown higher value, but in female S. cholesterol, S. triglyceride, S. LDL and S. HDL were elevated as compared to male (Table 7). The microvascular and macro-vascular complications more common in diabetic type 2 DM group-Retinopathy (36%), Neuropathy (22%), Nephropathy (19 %) and Ischemic heart disease (23%) (Table 8).

Table 1: Evaluation of clinical parameters in two groups of patients.

clinical parameters	Type 2 DM case (n =200)	Controls (n = 50)	P value
Fasting plasma glucose (mg/dl)	210.07±42.13	93.67±24.23	<0.001
Post prandial glucose (mg/dl)	253.50±44.62	137.74±26.48	<0.001
HbA1c (%)	9.39±10.23	5.6±1.3	<0.001
BMI (Kg/m^2)	26.0±3.0	23.45±10.2	<0.001

Values are expressed as Mean ± SD.
P-value < 0.001 considered as statistically significant differences.

Table 2: Evaluation of lipid parameters in two groups.

Lipid parameters	Type 2 DM case (n=200)	Controls (n=50)	P value
Total cholesterol mg/dl	174.40±27.87	142.24±49.03	<0.001
LDL mg/dl	125.82±34.63	106.76±27.29	<0.001
Triglyceride mg/dl	203.14±36.88	151.48±40.12	<0.001
HDL mg/dl	37.62±4.96	42.24±1.55	<0.001

Values are expressed as Mean ± SD.
P-value < 0.001 considered as statistically significant differences.

Table 3: Allotment of the controls and patients reported to their serum cholesterol level

Serum cholesterol level (mg/dl)	Control group	Type 2 DM case
<150	00	00
151-250	50	59
251-300	00	87
301-350	00	36
351-400	00	18
Total	50	200

Table 4: Allotment of the controls and patients reported to their serum triglyceride level.

Serum triglyceride level (mg.%)	Control group	Type 2 DM case
<150	50	57
150-199	00	56
200-499	00	54
≥500	00	33
Total	50	200

Table 5: Allotment of the controls and patients reported to their serum LDL level.

Serum LDL	Control	Type 2 DM
<130	23	33
130-159	27	63
>160	00	104
Total	50	200

Table 6: Allotment of the controls and of patients reported to their serum HDL level.

Serum HDL (mg/dl)	Control	Type 2 DM case
<40	39	147
≥60	07	40
40 – 59	04	13
Total	50	200

Table 7: Gender wise allotment of the lipid profile of type-2 DM patients (Mean values).

Gender	Serum cholesterol mg% mean	Serum triglyceride mg% mean	S. HDL mg% mean	S. LDL mg% mean
Female	274	243.25	38.03	196.45
Male	267	236.17	36.38	187.03

Table 8: Distribution of complications of patients.

Complications	No. of cases (200)	%	P value
Retinopathy	72	36	<0.001
Neuropathy	44	22	<0.001
Nephropathy	38	19	<0.001
Ischemic heart disease	46	23	<0.001

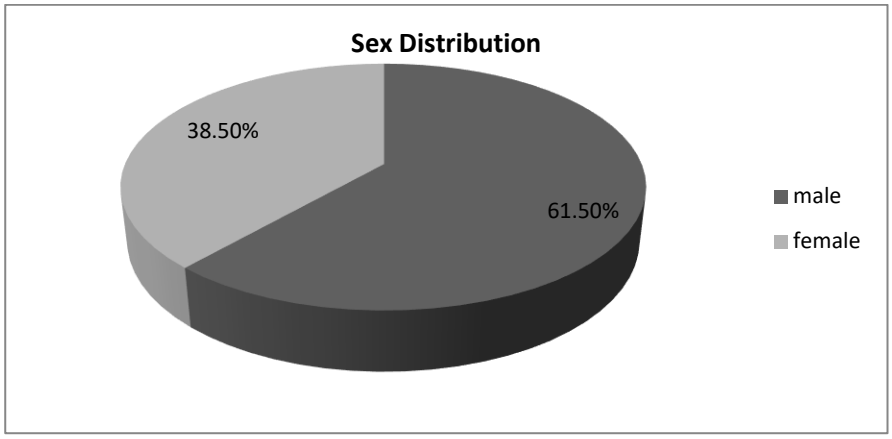

Fig: 1. Sex distribution

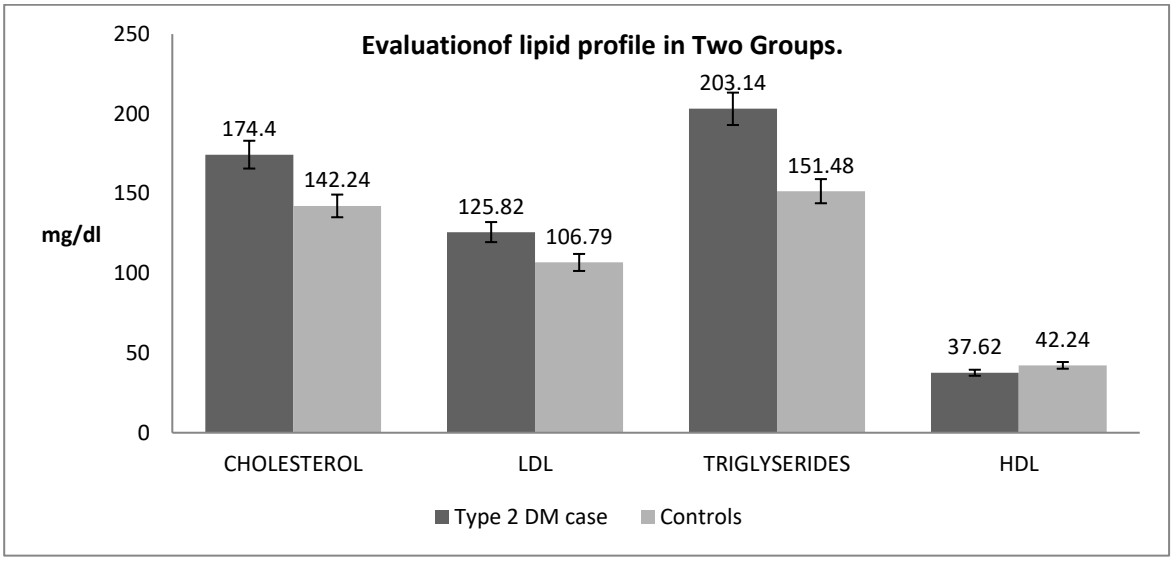

Fig: 2. Evaluation of lipid parameters in two groups

DISCUSSION:

Diabetic patients boast 3 to 4 time's bigger risk of coronary artery disease as compared to non-diabetic. The causes for it are manifold, which include dyslipidemia, hypertension, obesity and smoking. Dyslipidemia which is regularly present in diabetics in the form of increased triglycerides and decreased HDL cholesterol level. [7,8,10] It confers a large amount of accelerated and increased early on the risk of coronary artery disease, cerebrovascular disease, peripheral vascular disease and abrupt cardiac death. [11, 12] In this study also the increased triglycerides and decreased HDL cholesterol level. Increased triglycerides higher percentage in 71.5% type2 DM. decreased HDL cholesterol level in 73.5% type2 DM. in control group both values are in normal range. Diabetes is related with a bigger risk of mortality from cardiovascular disease (CVD) which is well known as dyslipidemia, which is characterized by raised triglycerides, low high-density lipoprotein (HDL) and high small dense low-density lipoprotein particles (LDL). [11] It may be present at the diagnosis of type 2 Diabetes mellitus and is a component of the metabolic syndrome. Atypical serum lipids are likely to contribute to the risk of coronary artery disease in diabetic patients. [8] Lipid abnormalities are common in diabetics and often seen in type-2 diabetics. In this study the majority of type 2 DM patients (70.5%) showed high serum cholesterol level. This present study cholesterol level Normal in a control group significant fall in the values. According to the CDC, 96% of adults with diabetes have one or additional lipid abnormalities while the prevalence of diabetic dyslipidemia varies from 25% to 60% in other studies. [9,13] This disparity in prevalence might be due to differences in BMI and possibly genetic variation. A study conducted in [14] showed that 23% of patients with

type-2 diabetes had raised serum cholesterol (>200 mg/dl) and 34. 3% of patients have raise triglycerides in serum (>150 mg/dl). [10] In our study serum triglycerides was raised in 71.5 % of the type 2 DM patients. The standards of serum triglycerides in our study are consistent with on top of the mentioned study. The grounds for dissimilarity in serum cholesterol values may be due to the difference in the dietary habits of the people. Another study conducted at Hazara division Pakistan on the occurrence of dyslipidaemia in type 2 diabetes mellitus in patients of Hazara division showed that serum triglyceride was raised in 59%. [17] In Singapore, fasting serum triglycerides levels, but not HDL and LDL concentrations, were found to be higher among persons with type 2 DM than those of nondiabetics. [18]

These results corroborated with the Study conducted by Mazzone et al, where he documented an increase in triglycerides. [9] In this study it was observed that apart from an increase in triglycerides and VLDL and decrease in HDL in 73.5% in type 2 diabetes mellitus. Total cholesterol also was found to be slightly raised in the study. A study conducted by Otamere HO et al also documented an increase in triglycerides, total cholesterol, LDL and decrease in HDL which was comparable to the result in this study. [10] Studies such as Albrki WM et al also documented increased levels of triglycerides, VLDL and decreased levels of HDL which was attractive much the portrait of our study. [11]

that HDL levels were low in the most common complication among the study population was Retinopathy with a rate of 36% followed by peripheral neuropathy (22%), nephropathy (19%) and ischemic heart disease (23%). According to ADA, the incidence of retinopathy at 10 years of diabetes is around 60%. [18]

The incidence of Peripheral Neuropathy in the study was around 22% which was close to that observed by A Ramachandran in their study which was around 27.5%.13 Siva Prabodh V et al conducted a study and recognizable elevated levels of Triglycerides, Total Cholesterol, Low-Density Lipoproteins and low levels of High-Density Lipoproteins, like to so as to observed in this present study. [19] Bijlaani PK et al and Barr et al found diabetics which were one of the findings in this study as well with mean HDL level of (37.62±4.96mg/dl) among the diabetic population compared to HDL level of (42.24±1.55 mg/dl) among non-diabetics. [15]

The lipid portion in the present studies was higher along with the females with Type2 diabetes mellitus than the males. The HDL levels are also lower in these patients compared to their male counterpart. Similar illustration was seen in a study by. [9]

CONCLUSION:

In this study result showed that there is significant normal lipid profile in control group (Healthy volunteers). As compared to Type2 diabetes mellitus case group. Hyperlipidemia is one of the most general complications of diabetes mellitus. It is recognized to prompt to rash atherosclerosis and macrovascular complications. We conclude that Common lipid abnormalities in diabetes are raised triglycerides, raised serum LDL, raised serum cholesterol and low serum HDL. Since these elevated levels can lead to CHD and its complications, increase cost of disease it is important for the monitoring of these lipid levels during the course of the disease. In our study This result recommended that, the implementation of the pharmaceutical care program might result in good lipid profile in Type2 diabetes mellitus.

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Conflicts of Interest: None declared

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