

## STUDY OF LIPID PROFILE IN DIABETIC MELLITUS IN TERTIARY CARE HOSPITAL

Mr. Kedar Prasad Yadav<sup>1</sup>, Dr. Ricky Mittal<sup>2</sup>

<sup>1</sup>Assistant Professor Dept. of Biochemistry K. M. Medical College and Hospital, Mathura (UP).

<sup>2</sup>Assistant Professor Dept. of Biochemistry K.M. Medical College and Hospital, Mathura (UP).

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**Corresponding author:** Dr. Ricky Mittal

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### Abstract

**INTRODUCTION:** Diabetes mellitus (DM) is a group of metabolic disorder which is characterized by increase blood glucose level resulting from defects in insulin secretion, insulin action or both and disturbances of carbohydrate, lipid and protein metabolism. Worldwide With an increasing incidence of DM may be a likely leading cause of morbidity and mortality in the future<sup>i</sup>. It is well known that dyslipidemia is a major risk factor for macrovascular complications with type-2 diabetes mellitus (T2DM) which affects 10%-73% of this population. It is well known that dyslipidemia is a major risk factor for macrovascular complications with type-2 diabetes mellitus (T2DM) which affects 10%-73% of this population. Dyslipidemia, hyperglycemia and hyperlipidemia are results of Insulin resistance and obesity combine cause and have additive cardiovascular risk. Therefore identification, critical evaluation and follow-up of serum lipid profile is important in DM continuously. One of the study showed that prevalence of dyslipidemia in diabetes mellitus is 95%. Major risk factor for Coronary Heart Disease is dyslipidemia. In DM patients cardiovascular disease is a cause of morbidity and mortality because of disturbance in lipoproteins i.e. serum triglycerides (TC) 69%, serum cholesterol 56.6%, Low Density Lipoprotein cholesterol (LDL) 77% and High Density Lipoprotein cholesterol (HDL) 71%.

**AIM:** The main aim of this study is to know the lipid profile in Diabetics mellitus (DM). **MATERIAL AND METHODS:** Total 100 patients with DM were included in this study during the period of 1 year. During the study period 100 normal healthy people without DM were also included as control study. From all the patients detail histories were taken as well as relevant clinical examination with routine investigations were also done. All the patients were for at least 12-14 hours overnight fasting and 5ml venous blood was collected in a disposable syringe on next morning (before breakfast) for the serum lipid profile and fasting blood sugar.

**RESULT:** In this study out of 100 diabetic patients 48 (48%) were males and 52 (52%) were females. 70% of DM patients showed high serum cholesterol level and all persons had normal serum cholesterol level in control group. 75% of DM patients showed high serum triglyceride level (>150mg/dl). 39% of DM patients showed Serum LDL level was high (>160 mg/dl). 85% of DM patients showed low (<40 mg/dl) serum HDL value.

**CONCLUSION:** In DM patients lipid abnormalities in diabetes are raised serum cholesterol, raised triglycerides, and raised serum LDL and low serum HDL. Therefore there is important impact of dyslipidemia on cardio vascular complications required complete attention throughout the course of disease. Hence early screening of diabetic patients for dyslipidemia and intervention is necessary to minimize the risk of cardiovascular diseases.

**KEYWORDS:** Diabetes mellitus (DM), dyslipidemia, cholesterol, triglyceride

### INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic disorder which is characterized by increase blood glucose level resulting from defects in insulin secretion, insulin action or both and disturbances of carbohydrate, lipid and protein metabolism<sup>ii</sup>. When DM is characterized by absence of insulin then that is known as NIDDM-Type 1 and when DM is insensitive to the insulin then that is known as IDDM or type II. This is a complex disease in which there is also impaired of carbohydrate and fat metabolism<sup>iii</sup>. The

prevalence of diabetes mellitus is growing rapidly worldwide. There are many studies in which the global prevalence of people suffering from diabetes mellitus is estimated to rise from current estimate of 415 million to 642 million by 2040. There are increasing in number of people with type 2 diabetes mellitus in most of the countries and 75% of people with diabetes mellitus are living in developing countries<sup>iv</sup>. Worldwide With an increasing incidence of DM may be a likely leading cause of morbidity and mortality in the future<sup>v</sup>. It is well known that

dyslipidemia is a major risk factor for macrovascular complications with type-2 diabetes mellitus (T2DM) which affects 10%-73% of this population<sup>vi</sup>.

There are many studied which showed that mainly body fat is responsible for increase in prevalence of this disease among the body composition components. In the early time as 1988 DM was described a multi factorial metabolic abnormality consisting of insulin resistance with compensatory hyperinsulinaemia, essential hypertension and hypercholesterolaemia<sup>vii, viii, ix & x</sup>. However nowadays World Health Organization (WHO) and International Diabetes Federation (IDF) used the term “Metabolic Syndrome” to describe this clustering of conditions<sup>xi</sup>. When it is ranked with the caused with death it is ranked as 7th among leading causes of death & has been rated 3<sup>rd</sup> when its fatal complications are taken in to account. Patients with DM are in increased risk of cardiovascular disease which is associated with atherogenic dyslipidemia. Especially myocardial infarction and Coronary artery disease as well as atherosclerosis and hyperglycemia are known as leading cause of morbidity and mortality worldwide<sup>xii, xiii</sup>.

Dyslipidemia, hyperglycemia and hyperlipidemia are results of Insulin resistance and obesity combine cause and have additive cardiovascular risk. Therefore identification, critical evaluation and follow-up of serum lipid profile is important in DM continuously. One of the study showed that prevalence of dyslipidemia in diabetes mellitus is 95%. Major risk factor for Coronary Heart Disease is dyslipidemia<sup>xiv, xv</sup>. In DM patients cardiovascular disease is a cause of morbidity and mortality because of disturbance in lipoproteins i.e. serum triglycerides (TC) 69%, serum cholesterol 56.6%, Low Density Lipoprotein cholesterol (LDL) 77% and High Density Lipoprotein cholesterol (HDL) 71%<sup>xvi, xvii</sup>. The main aim of this study is to know the lipid profile in Diabetics mellitus (DM).

**MATERIAL AND METHODS:**

This is the study was carried out in the department of Biochemistry at K.M. Medical college and Hospital, Mathura UP. Total 100 patients with DM were included in this study during the period of 1 year with different age group. From all the patients’ lipid profile were evaluated and recorded. During the study period 100 normal healthy people without DM were also included as control study. From all the patients detail histories were taken as well as relevant clinical

examination with routine investigations were also done. All the patients were for at least 12-14 hours overnight fasting and 5ml venous blood was collected in a disposable syringe on next morning (before breakfast) for the serum lipid profile and fasting blood sugar.

**OBSERVATION AND RESULTS:**

In this study lipid profile were done for total 100 patients with DM and the result were evaluated. Out of 100 diabetic patients 48 (48%) were males and 52 (52%) were females. In the DM patients maximum numbers of patients were in the age group 35 years to 55 years. 70% of DM patients showed high serum cholesterol level (<250 serum cholesterol level) and all persons had normal serum cholesterol level in control group as shown in table no 1 below.

**Table 1: Distribution of the controls and patients according to their serum cholesterol level**

Serum cholesterol level	DM	Control
<150	8	76
151-250	22	24
251-300	46	0
301-350	8	0
351-400	16	0
<b>Total</b>	<b>100</b>	<b>100</b>

75% of DM patients showed high serum triglyceride level (>150mg/dl) where as control group showed normal level of serum triglyceride level as shown in table no 2 below.

**Table 2: Distribution of the controls and patients according to their serum triglyceride level.**

Serum triglyceride level	DM	Control
<150	25	100
150-199	24	0
200-499	39	0
>500	12	0
<b>Total</b>	<b>100</b>	<b>100</b>

39% of DM patients showed Serum LDL level was high (>160 mg/dl) where as control showed normal value as shown in table no 3 below.

**Table 3: Distribution of the controls and patients according to their serum LDL level.**

Serum LDL level	DM	Control
<130	23	91
130-159	38	9
>160	39	0
<b>Total</b>	<b>100</b>	<b>100</b>

85% of DM patients showed low (<40 mg/dl) serum HDL value as shown in table no 4 below.

**Table 4: Distribution of the controls and patients according to their serum HDL level.**

Serum HDL level	DM	Control
<40	85	25
> or = 60	15	75
<b>Total</b>	100	100

**DISCUSSION:**

Dyslipidemia is one of the common disorders seen in most of the diabetes patients which is associated with a greater risk of mortality from cardiovascular disease (CVD) and characterized by raised triglycerides, low high density lipoprotein and high small dense low density lipoprotein particles. Abnormal serum lipids are likely to contribute to the risk of coronary artery disease and other complications of atherosclerosis in diabetic patients<sup>xviii</sup>. According to the CDC, in adults with diabetes have one or more lipid abnormalities is about 97% whereas the prevalence of diabetic dyslipidemia varies from 25% to 60% in many studies<sup>xix</sup>.

In this study showed 70% of DM patients showed high serum cholesterol level. This variation in prevalence may be due to differences in body mass index and possibly genetic variation. According to the studied conducted by Ahmad et al<sup>xx</sup> 21% patients with type 2 diabetes had raised serum cholesterol (>200 mg/dl) and 34. 2% patients have raised triglycerides in serum (>150 mg/dl). 75% patients with DM showed serum TG was raised in this study which showed higher. The reason for difference in serum cholesterol values may be due to difference in the dietary habits of the people. The study done by G. D. Bhambhani et al<sup>xxi</sup> serum LDL level was high in 78% of type 2 DM patients, while only 19% of type 1 DM patients showed higher value which is higher than this study.

**CONCLUSION:**

In DM Hyperlipidemia is the commonest complication and it predisposes them to premature atherosclerosis and macrovascular complications. In DM patients it is evident that all the lipid fractions are elevated when compared to healthy controls suggesting that DM has a real impact on lipid metabolism from this study. In DM patients lipid abnormalities in diabetes are raised serum cholesterol, raised triglycerides, and raised

serum LDL and low serum HDL. Therefore there is important impact of dyslipidemia on cardio vascular complications required complete attention throughout the course of disease. Hence early screening of diabetic patients for dyslipidemia and intervention is necessary to minimize the risk of cardiovascular diseases.

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