

## PATTERN OF SERUM LIPID PROFILE & GLYCOSYLATED HAEMOGLOBIN IN INDIAN DIABETIC PATIENTS

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### ABSTRACT

**Background:** Diabetes is rising globally, particularly in India. India is the second largest country in terms of diabetic population. Majority of Diabetic patients also do suffer from dyslipidaemia.

**Aims & Objective:** This is an observational study done to establish the relationship between glycosylated Hb level and lipid profile in Indian diabetic population.

**Materials and Methods:** This is an observational study. 50 diabetic patients were studied between the period of 1990- 2000 between February to November. 16 patients were (32%) females and 34 (68%) were males. They were from 25-72 years of age.

**Results:** 17 (34%) patients were >60 years of age, 16 (32%) were between 50-60 years of age, 9(18%) were between 40-50 years of age, 6(12%) patient were between 30-40 years of age where only 2 (4%) patient were between 20-30 years of age. Out of the 50, 39 (78%) patients were on oral hypoglycemic drugs, 7 (14%) patients were on insulin and 4 (8%) patients were on insulin and oral hypoglycemic agents. 34 (68%) patients were regularly taking drugs whereas 16 (32%) patients were on irregular treatment. Positive family history of diabetes was found in 7 (14%) and hypertension in 11 (22%) of the diabetic patients and 36 (72%) patients had negative family history. Laboratory results showed a mean FBS of 174mg/dL and PPBS of 264mg/dL. More than two thirds [33 (66%)] of the participants had HbA1c >10% and the rest 17 (34%) had HbA1c <10%. Statistically significant change was observed in serum triglycerides and in serum LDL in patients with higher HbA1c (>10% vs. <10%) whereas changes in other parameters and ratio were statistically insignificant.

**Conclusion:** The current study endorses the positive correlation between uncontrolled diabetes and high serum triglycerides and LDL-C level.

**Key Words:** Diabetes; Glycosylated Haemoglobin; Lipid Profile; Triglycerides

### Introduction

Lifestyle diseases are constantly rising in India as a result of rapid urbanization associated with decreased physical activity. Recent international diabetes federation 2013 report shows we are home to more than 65 million diabetics. Diabetes is associated with high risk of cardiovascular diseases when compared to non-diabetic counterparts. Hence physicians should aggressively manage all CV risk factors in diabetics.<sup>[1,2]</sup> Dyslipidaemia is one of the most important CV risk factor that co-occurs with type 2 diabetes mellitus in more than 70 % of the patients and the typical pattern of dyslipidaemia is known as diabetic dyslipidaemia. Diabetic dyslipidaemia is characterized by high plasma triglyceride concentration, low HDL cholesterol concentration and increased concentration of small dense LDL-cholesterol particles.<sup>[3-5]</sup>

The present study was conducted at Shree Krishna Hospital, Karamsad to evaluate the type of lipid profile in patients of diabetes and its correlation to different levels HbA1c. The aims and objectives of this study were to evaluate the pattern of lipid profile in diabetics and also

to evaluate the pattern of HbA1c in diabetics and their relation with lipid profile.

### Materials and Methods

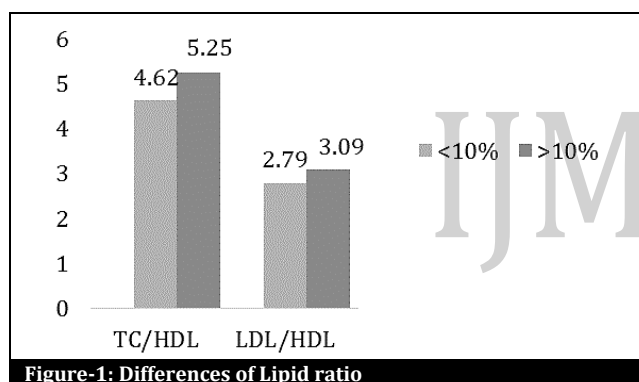
Patients selected for the present study were randomly selected from different wards and the outpatient department of the Shree Krishna hospital. The in patients admitted for control of diabetes mellitus, freshly diagnosed diabetes and known diabetics admitted with other diseases/ complications like ischemic heart disease/ tuberculosis/diabetic foot were included. All the patients were studied by taking detailed history and physical examination. Patients were also examined for evidence of hypercholesterolemia. The findings were reordered in a prepared proforma to avoid any omission. 50 cases were studied between the period of 1990- 2000 between February to November. Only patients willing to participate were included in the study. Blood sample collected was analyzed for serum cholesterol, serum triglycerides, HDL-C, LDL-C (indirect), VLDL-C, TC/HDL, LDL/HDL, HbA1c.

## Results

Out of 50 patients 16 were (32%) females and 34 (68%) were males. They were from 25-72 years of age. 17 (34%) patients were >60 years of age, 16 (32%) were between 50-60 years of age, 9 (18%) were between 40-50 years of age, 6 (12%) patient were between 30-40 years of age where only 2 (4%) patient were between 20-30 years of age. Out of the 50, 39 (78%) patients were on oral hypoglycemic drugs, 7 (14%) patients were on insulin and 4 (8%) patients were on insulin and oral hypoglycemic agents. 34 (68%) patients were regularly taking drugs whereas 16 (32%) patients were on irregular treatment. Majority of the patients were below BMI of 25 and 16 (32%) had BMI above 25.

**Table-1: Lipid profile**

	S cholesterol		S Triglycerides		S HDL		S VLDL		S LDL		TC/HDL		LDL/HDL	
	< 10%	> 10%	< 10%	> 10%	< 10%	> 10%	< 10%	> 10%	< 10%	> 10%	< 10%	> 10%	< 10%	> 10%
<b>Mean</b>	175.65	189.45	154.47	191.33	38.06	38.67	47.06	43.03	93.94	111.27	4.62	5.25	2.79	3.09
<b>SD</b>	32.49	66.92	91.57	150.09	6.64	13.45	40.74	38.24	44.71	58.35	0.6	2.08	0.85	1.081
<b>SE</b>	7.8	11.65	21.22	26.14	1.61	2.34	9.88	6.65	10.85	10.16	0.14	0.36	0.2	0.18



**Figure-1: Differences of Lipid ratio**

Positive family history of diabetes was found in 7 (14%) and hypertension in 11 (22%) of the diabetic patients and 36 (72%) patients had negative family history. Majority of the patients 31 (62%) had no history of smoking or alcohol consumption 19 (38%) had positive history of smoking and one (2%) had history of alcohol consumption.

Laboratory results showed a mean FBS of 174 mg/dL and PPBS of 264 mg/dL. More than two thirds [33 (66%)] of the participants had HbA1c >10% and the rest 17 (34%) had HbA1c <10%.

Statistically significant change was observed in serum triglycerides and in serum LDL in patients with higher HbA1c (>10% vs. <10%) whereas changes in other parameters and ratio were statistically insignificant.

## Discussion

Cardiovascular deaths are the most common cause of mortality in diabetes and India is one of the leading countries with one of the highest number of diabetics.<sup>[2,6]</sup>

Dyslipidaemia is closely associated with diabetes and typical pattern of dyslipidaemia in diabetics are commonly referred to as diabetic dyslipidaemia. Even in this study we have observed that serum triglyceride levels were higher in diabetic patients with higher HbA1c. This is mostly due to the insulin resistance due to which the hormone sensitive lipase in adipose tissue is not inhibited postprandial leading to high levels of free fatty acid and subsequently high triglycerides.<sup>[4]</sup> Several

studies have shown high serum triglycerides associated with insulin resistance.<sup>[7]</sup> Thus as evidenced in this study it is important to address both insulin resistance and high triglycerides.

## Conclusion

Type 2 diabetes mellitus is rapidly becoming one of the most important causes of mortality in both developing and developed countries and significantly affects the economy.<sup>[8]</sup> For control of diabetes we must address all the comorbidities that occur with type 2 diabetes mellitus. Alteration in serum lipids that co-occurs has been well established and has to be evaluated a managed to decrease the CV risk in type 2 diabetics.

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