



STUDY OF CORRELATION BETWEEN BMI AND LIPID PROFILE IN KARNATAKA

Dr. Aftab Begum¹, Dr. Siraj Ahmed S², Dr. Prabhu M.H^{3*}

¹ MBBS MD, Assistant Professors, Department of Physiology, KAMS, Karnataka, India

² MBBS MD, Department of Anatomy, GIMS, Gadag, India.

^{3*} MBBS MD, Associate Professors, Department of Pathology, S N Medical College, Bagalkote, India

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ABSTRACT

Introduction: Diabetes Mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia resulting from variable interactions of hereditary and environmental factors due to defects in insulin secretion, insulin action or both. There are two main types (type I DM) & (type II DM). **Methodology:** Fifty type II DM cases aged between 30-55 years and minimum of fifty age and sex matched controls were selected from the general population satisfying the inclusion criteria. Subjects between 30-55 yrs of age with type II diabetes mellitus. Diagnosed type II diabetes mellitus cases of more than five years duration. Age and sex matched controls. Blood sampling and preparation of serum. **Results:** India leads the world today with the largest number of diabetics in any given country. Diabetes is a major cause of mortality. A recent estimate suggested that diabetes was the fifth leading cause of death worldwide. **Conclusion:** There was significant increase in weight, BMI in type II diabetics when compared to controls. This study also showed significant positive correlation between BMI and total cholesterol and LDL cholesterol levels and no significant correlation with triglycerides, HDL and VLDL cholesterol levels in type II DM cases when compared to controls.

Key words: correlation between BMI and lipid profile

INTRODUCTION:

Diabetes Mellitus (DM): is a group of metabolic disorders characterized by hyperglycemia resulting from variable interactions of hereditary and environmental factors due to defects in insulin secretion, insulin action or both.¹ There are two main types of diabetes mellitus. Insulin dependent diabetes mellitus (type I DM) - occurs when there is severe lack of insulin due to destruction of most or all of beta cells in the islets of langerhans. Non insulin dependent diabetes mellitus (type II DM) - occurs when body does not produce enough insulin and the insulin that is produced becomes less effective.²

METHODOLOGY:

The study was conducted in the Physiology department, J.J.M Medical College, Davangere. Duration of the study was one year from May 2011 to May 2012.

Fifty type II DM cases aged between 30-55 years and minimum of fifty age and sex matched controls were selected from the general population satisfying the inclusion criteria.

Following an explanation about the nature and purpose of the study, those subjects who were willing to participate in the study were included after obtaining written informed consent.

A detailed assessment was done and a pretested structured proforma was used to record the relevant information from each individual case selected. Data acquisition was performed in the morning. Following detailed assessment of the subjects, they were screened for the presence of inclusion and exclusion criteria and dropped if any exclusion criteria were present.

Inclusion criteria:

- Subjects between 30-55 yrs of age with type II diabetes mellitus.
- Diagnosed type II diabetes mellitus cases of more than five years duration.
- Age and sex matched controls

Exclusion Criteria:

- Known diabetics of duration less than five years.
- Subjects with history of cardiac diseases, hypertension, smoking and alcoholism.

- Subjects on hypolipidemic drugs or contraceptive pills.

Subjects below 30yrs or above 55 yrs of age

Blood sampling and preparation of serum:

8 ml of venous blood is drawn from antecubital vein under aseptic precautions in a sterile bulb from selected subject after overnight fasting. All parameters will be estimated using serum separated by centrifugation by semiautoanalyzer.

RESULTS:

Subject Information:

Sex Distribution : Out of 50 subjects 20 were male’s and 30 were female in type I DM cases, type II DM cases and controls of each group respectively (Table- 14, Graph- 1) .

Age :The mean age (yrs) was 31.1 ± 7.4 , 31.4 ± 6.3 , 45.8 ± 4.9 and 45.9 ± 5.0 in type I DM cases, type I DM controls type II DM cases and type II DM controls respectively (Table-14, Graph-1).

Height: The mean height (in cms) were 161.58 ± 8.3 and 160.98 ± 6.02 in type II DM cases and controls respectively (Table-23, Graph-6). There was no significant

difference in height between type I DM cases and controls ($p>0.05$).

Weight: The mean weight (in kgs) were 64.44 ± 7.78 and 57.46 ± 5.65 in type II DM cases and controls respectively (Table-23, Graph-6). There was statistically highly significant increase in weight in type II diabetics when compared to controls ($p< 0.001$).

Body Mass Index (BMI): The BMI (in kg /m^2) were 24.55 ± 2.19 and 22.15 ± 1.37 in Type II DM cases and controls respectively (Table-23, Graph-6). There was highly significant increase in BMI among type II diabetics when compared to controls ($p < 0.001$).

BMI and Lipid profile: There was significant positive correlation between BMI with total cholesterol and LDL cholesterol level among type II DM Cases (Table-30, Graph-13) ($p < 0.01$).

Where as there was no significant correlation between BMI and triglyceride, HDL and VLDL cholesterol levels in type II DM cases ($p> 0.05$) (Table-30).

Table 14: Age and Sex Comparison of the Group's Studied

Variables		DM- II	CONTROLS
Subjects	NO	50	50
Gender	Male	20	20
	Female	30	30
Age (yrs)	Mean \pm SD	48.8 ± 4.9	47.9 ± 5.0
	Range	35-54 Yrs	35-54 Yrs

Table 23: Comparison of variables Between Type - II DM cases and Controls

Type II DM					
Variable	Group	Mean	SD	t value	p value
HEIGHT(cms)	DM II	161.58	8.34	0.41	0.68
	Controls	160.98	6.02		
WEIGHT(kg)	DM II	64.44	7.78	5.13	0.000 **
	Controls	57.46	5.65		
BMI(kg/m^2)	DM II	24.55	2.19	6.57	0.000 **
	Controls	22.15	1.37		
PULSE(mmHg)	DM II	75.18	1.11	0.70	0.47
	Controls	76.21	10.2		
SBP(mmHg)	DM II	123.5	1.11	1.74	0.08
	Controls	120.42	12.4		
DBP(mmHg)	DM II	79.44	3.23	0.47	0.64
	Controls	79.16	2.65		

Unpaired t test
 ** $p<0.001$,HS
 $p>0.05$: not Sig.

Table 24: Comparison of FBS and Lipid Profile Parameters between Type II DM Cases and Controls

Variable	Group	Mean	SD	p value
FBS(mg/dl)	DM II	164.32	57.09	0.000 **
	Controls	87.98	9.66	
T.C(mg%)	DM II	287.64	75.18	0.000 **
	Controls	157.28	25.71	
TGs(mg%)	DM II	244.35	118.58	0.000 **
	Controls	158.67	79.78	
HDL(mg%)	DM II	39.75	12.29	0.024*
	Controls	43.57	13.12	
LDL(mg%)	DM II	178.11	77.00	0.000 **
	Controls	90.02	27.77	
VLDL(mg%)	DM II	88.67	18.25	0.000 **
	Controls	32.97	16.76	

Unpaired t test

* p < 0.05, Sig

** p < 0.001, HS

p > 0.05: not Sig.

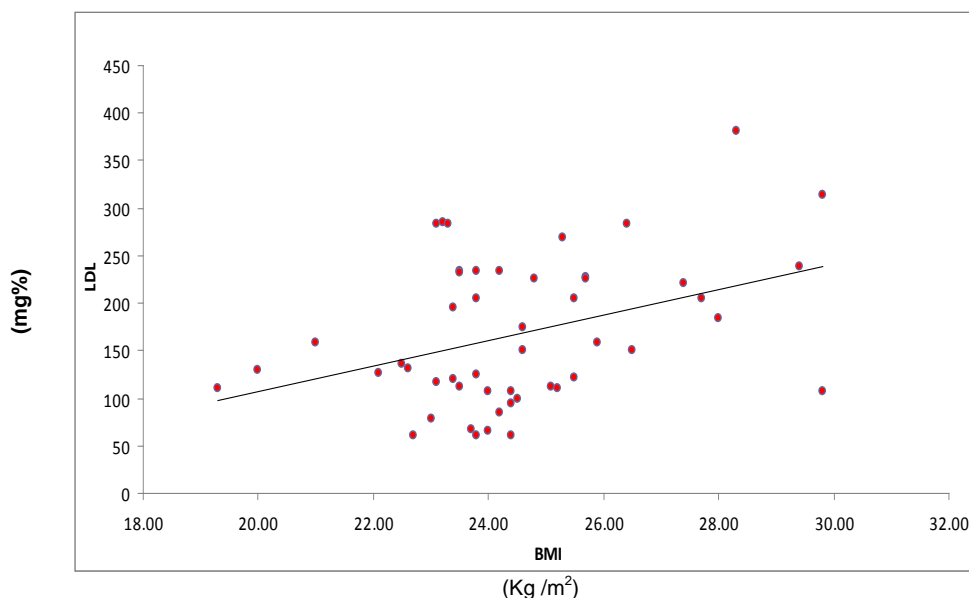
Table 30: Comparison of Relationship between BMI, FBS and Lipid Profile Parameters In Type II DM Cases

Variable		TC (mg%)	TG (mg%)	HDL (mg%)	LDL (mg%)	VLDL (mg%)
BMI (kg/m ²)	r-value	0.42	0.06	0.1	0.38	0.09
	p-value	0.002 **	0.69	0.51	0.007**	0.56

Pearson's correlation Co-efficient

** p < 0.01 , Sig

** p < 0.001,highly Sig.



Graph 13: Relationship Between BMI and LDL in Type II DM Cases

DISCUSSION

India leads the world today with the largest number of diabetics in any given country. Diabetes is a major cause of mortality, but several studies indicate that diabetes is likely under reported as a cause of death. A recent estimate suggested that diabetes was the fifth leading cause of death worldwide.

The present study is aimed at the evaluation of the asymptomatic diabetes mellitus patients. It consists of assessing the biochemical parameter such as lipid profile with basic parameters (Ht, Wt, BMI)

This study consisted of 100 subjects with 50 Type II DM cases of more than 5 years duration respectively and 50 controls were evaluated.

Lipid profile:

In our study type II diabetics showed statistically significant increase in total cholesterol, triglycerides, LDL and VLDL cholesterol levels and decrease in HDL cholesterol levels when compared to their controls.

Weight and Body Mass Index:

In this study increase in weight and BMI was seen in type II diabetics when compared to controls.

This increased weight and BMI in diabetics could be due to increase in adiposity associated with insulin resistance attributed to more of sedentary life style and less physical activity. Increase in body weight and BMI are important predictors of metabolic disturbances including dyslipidemia, hypertension and cardiovascular diseases³.

Similar findings were also seen in study done by Sani FB et al.¹

Our study also showed significant positive correlation between BMI and total cholesterol and LDL cholesterol levels and no significant correlation with triglycerides,

HDL and VLDL cholesterol levels in type II DM cases when compared to controls.

This significant and strong association of BMI with lipid abnormalities could be due to obesity and sedentary life style and is matter of great concern as they are at increased risk of early cardiovascular diseases.⁴

CONCLUSION:

➤ There was significant increase in weight, BMI in type II diabetics when compared to controls.

➤ There was a significant increase in serum total cholesterol, total triglyceride, LDL and VLDL cholesterol levels where as decreased HDL cholesterol level is seen in type II diabetics when compared to controls.

➤ This study also showed significant positive correlation between BMI and total cholesterol and LDL cholesterol levels and no significant correlation with triglycerides, HDL and VLDL cholesterol levels in type II DM cases when compared to controls.

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