

TO STUDY THE LIPID PROFILE AND HBA1C STATUS IN TYPE2 DM OBESE AND NON OBESE.

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Abstract

Patients (male and female) seeking medical attention at Amaltas Institute of Medical Sciences, Dewas (M.P), who have been diagnosed to have type 2 DM in obese and non-obese was included in this study.

There was no difference in the glycemic status of males and females as measured by Fasting glucose levels and HbA1c. HbA1c showed positive correlations with TC, TG, LDL & VLDL and negative correlations was found between HbA1c and HDL levels. These findings suggest that HbA1c level can be used as good parameter for predicting the lipid profile of both male and female diabetic patients. So, HbA1c may be utilized for screening diabetic patient for risk of cardiovascular events and also for timely intervention with lipid lowering drugs.

Keywords: Lipid Profile, HBA1C, Type 2 DM & Obesity

Introduction:

Diabetes mellitus is a global endemic with rapidly increasing prevalence in both developing & developed countries¹. India is declared as the Diabetic Capital of the world by WHO². The prevalence of Diabetes is rapidly rising all over the globe at an alarming rate. Diabetes is second only to cardiovascular disease as a health burden in india³. Type II Diabetes Mellitus is commonly associated with Obesity, Ethnicity, Sedentary Lifestyles, Sex, Family history, Hypertension, Smoking & Alcohol consumption. [1]

The Indian population with diabetes mellitus type II is expected to rise to 101 million by 2030². The major morbidities in type 2 diabetes mellitus (T2DM) are due to its microangiopathic and macroangiopathic complications which affect eyes, kidneys, nerves, heart and major vessel. [2,3]

Obesity is an increasing public health problem that is associated with cardiovascular death. The metabolically deleterious form of obesity is associated with ectopic lipid deposition in multiple tissues, including the heart [4,5].

Material & Method

The present observational study entitled "To Study the Lipid Profile and HBA1C Status in Type2 DM

Obese and Non Obese" was conducted in the Department of General Medicine, Amaltas Institute of Medical Sciences, Dewas (M.P) during the period of April 2018 to March 2019. The patients who attend the Emergency/OPD/IPD were asked to participate in the study. Study was done according to the regulations of the Institutional Ethics Committee.

Source of data

Patients (male and female) seeking medical attention at Amaltas Institute of Medical Sciences, Dewas (M.P), who have been diagnosed to have type 2 DM in obese and non-obese was included in this study.

A Prestructured Pro forma was used to collect the baseline data. All patients giving the written consent for participation in the study.

Sample Size

SS = 4PQ/L2.

Prevalence was 55.9%. (1)

L2=10%.

Therefore sample size of 150 was taken as convenience and divided in to two group In which, Group A: Obese Diabetics (50%).

Group B: Non obese diabetics (50%).

Inclusion Criteria

1. Patients with body mass index (BMI) >25 were taken up as case.
2. Age between 18 -65 years of both sexes were studied
3. Patient with type 2DM in obese and non-obese.

Exclusion Criteria

1. Subjects with BMI <18 and between 23 and 25.
2. Patients on any lipid lowering therapy.
3. Hypothyroidism.
4. Ascites.
5. Pregnancy.
6. Patients not willing for the study.
7. Patients with h/o previous cardiac, abdominal surgeries and presence of scar in areas.

METHOD

Echocardiography will performed 2D ECHO Machine Philips Ie33 using probe SS1 by a single observer. Three measurements will be done, and the average value was taken. It is defined as a relative echo-free

space between the outer wall of myocardium and the visceral layer of pericardium, and its thickness was measured in parasternal long and short axis B-mode still free images perpendicular to the free wall of right ventricle at end-systole, using the aortic annulus as the anatomic reference for the parasternal long axis view and the papillary muscle level for short axis view.

Ultrasound abdomen was performed by using Philips IU 22 with linear probe of L9-12 frequency. Three measurements were done, and the average value was taken for statistical analysis. Ultrasonography-determined subcutaneous fat was taken as the distance between the skin and external face of the rectus abdominis muscle, and visceral fat was taken as the distance between the internal face of the same muscle and the anterior wall of the aorta. Lipid profile was done.

Results

Table 1: Lipid parameters categorized by patient’s glycemic control (HbA1c)

Parameter	HbA1c < 7 (GGC)	HbA1c > 7 (PGC)	P value
FBG (mg/dl)	107.44 ±22.26	144.59 ±38.68	P < 0.023
HbA1c (%)	6.48 ± 0.48	8.11 ± 1.14	P < 0.047
TC (mg/dl)	143.56 ±27.01	156.08 ±29.58	P = 0.0
TG (mg/dl)	139.18 ±45.77	166.91 ±67.40	P = 0.070
LDL (mg/dl)	66.93 ±20.88	76.71 ±22.61	P = 0.063
VLDL (mg/dl)	27.88 ±9.15	34.24 ±13.48	P = 0.037
HDL (mg/dl)	54.64 ±7.28	51.87 ± 7.5	P = 0.031

Table 2: Comparison of the mean levels of biochemical parameters of type 2 diabetic based on duration of disease (< 5 years & > 5 years)

DURATION OF DISEASE	Hba1c	TOTAL CHOLESTEROL	TGL	HDL	VLDL	LDL
<5 YEARS	8.03	194.5	178	41.3	35	115
>5 YEARS	8.45	199.4	177	39.5	37.9	122
	0.320	0.610	0.227	0.304	0.506	0.442
SIG	NS	NS	NS	NS	NS	NS

Discussion

In the present study, we have evaluated the pattern of lipid profile parameters in Diabetic subjects & its correlation with Hba1c. The levels of Hba1c & lipid profile parameters didn’t differ significantly between male & female. The present study has shown a significant rise in total cholesterol, TGL, LDL in patients who were overweight which are well established risk factors for cardiovascular diseases, Hyperinsulinemia, Hypertension. Insulin impacts the liver apolipoprotein production which regulates the enzymatic activity of lipoprotein lipase & cholesterol

ester transport protein. These could be the likely causes of dyslipidemia in Diabetes Mellitus as reported by Goldberg[6]. Insulin deficiency also reduces the activity of hepatic lipase & several other steps in the production of biologically active lipoprotein lipase may also be altered in Diabetes Mellitus[7]. Both Lipid profile & body fat have been shown to be the important predictors for metabolic disturbances. Obesity is said to predispose individuals to Diabetes while Dyslipidemia is associated with Obesity & Diabetes Mellitus. By comparing the groups it is found that there was no significant

difference in lipid levels with effect to duration of diabetes. This is in contrast to the study of Syed M Farid [8] in which lipid profile was found to be more abnormal with increase in duration of Diabetes Mellitus.

In this study we have evaluated the correlation between glycemic control (HbA1c) and lipid profile among diabetic patients. Gender wise evaluation of the data shows that there is no significant difference in glycemic parameters as well as lipid profile between males and females except in HDL values which are significantly higher in females. This warrants the need for more critical monitoring of lipid profile in diabetic males so as to prevent cardiovascular complications in them. This study shows that quite a good number of diabetic patients have hypercholesterolemia, hypertriglyceridemia, high LDL and low HDL levels which are well established risk factors for cardiovascular diseases. Insulin impacts the liver apolipoprotein production which regulates the enzymatic activity of lipoprotein lipase and Cholesterol ester transport protein. These could be the likely causes of dyslipidemia in Diabetes mellitus as reported by Goldberg[9]. Over and above this, insulin deficiency also reduces the activity of hepatic lipase and several other steps in the production of biologically active lipoprotein lipase may also be altered in DM[10].

Conclusion

There was no difference in the glycemic status of males and females as measured by Fasting glucose levels and HbA1c. HbA1c showed positive correlations with TC, TG, LDL & VLDL and negative correlations was found between HbA1c and HDL levels. These findings suggest that HbA1c level can be used as good parameter for predicting the lipid profile of both male and female diabetic patients. So, HbA1c may be utilized for screening diabetic patient for risk of cardiovascular events and also for timely intervention with lipid lowering drugs.

References

1. Shirani J, Berezowski K, Roberts WC, Quantitative measurement of normal and excessive (cor adiposum) subepicardial adipose tissue, its clinical significance, and its effect on electrocardiographic QRS voltage. *Am J Cardiol.* 1995;76:414-418.
2. Reiner L, Mazzoleni A, Rodriguez FL. Statistical analysis of the epicardial fat weight in human hearts. *AMA Arch Pathol.* 1955;60:369-373.
3. Marchington JM, Mattacks OA, Pond CM. Adipose tissue in the mammalian heart and pericardium: structure, foetal development and biochemical properties. *Comp Biochem Physiol B.* 1989;94:225-232.
4. Iacobellis G, Ribaldo MO, Assael E et al, Echocardiographic epicardial adipose tissue is related to anthropometric and clinical parameters of metabolic syndrome: a new indicator of cardiovascular risk. *J Clin Endocrinol Metab.* 2003; 88:5163-5168.
5. Iacobellis G, Willens HJ, Barbaro G, Sharma AM. Threshold values of high-risk echocardiographic epicardial fat thickness. *Obesity*, 2008;16:887-892.
6. Goldberg U. Lipoprotein Lipase & Lipolysis: central roles in lipoprotein metabolism & atherogenesis. *J. Lipid Res* 1996;37:693-707.
7. Tavangar K, Murata Y, Pedersen ME, Goers JF, Hoffman AR, Kraemer FB. Regulation of lipoprotein lipase in the diabetic rat. *J. Clin Invest* 1992;90:1672-1678.
8. Syed M Farid. Impact of duration of Diabetes & age on Lipid profile & Glycemic Control in Type 2 Diabetics. *Global J. of Bioscience & Bio-Technology.* vol6(1)2017:46-51.
9. Pyorala, K, Pedersen, TR, Kjekshus, J., Faergeman, O., Olson AG, Thorgeirsson, G (1997). Cholesterol lowering with simvastatin improves prognosis of diabetic patients with coronary artery disease: a sub group analysis of the Scandinavian simvastatin survival study (48). *Diabetes Care*, 20(4):614-620.
10. Robins SI., Collins D., Wittes, JT., Papamertziou V, Deedwania et al. Relation of Gemfibrozil treatment & lipid levels with major coronary events: VA-HIT: a randomized controlled trial, *JAMA*, 285(12):1585-1591.