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Pattern of Lipid Profile and Glycated Hemoglobin in Type- 2 Diabetes

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Abstract

Background: Dyslipidemia is a common complication of diabetes. dyslipidemic pattern and its correlation with glycated hemoglobin in patient of diabetes mellitus has been well stutided. and might be informative to the diagnostic therapeutic and prognostic aspect of diabetes mellitus. **Objective:** To study lipid profile and glycated hemoglobin in type -2 DM. **Methodology:** This cross sectional comparative study was carried out in the Department of Pathology, TMSS Medical College & Rafatullah Community Hospital, Bogra, Bangladesh during the period of July 2013 to June 2015. A total number of 100 subjects of both sexes were selected with age ranging from 40 to 60 years. Among them 50 each already diagnosed type -2 DM along with 50 control were studied. For statistical analysis unpaired students t test was performed by using SPSS for windows version 16. **Conclusion:** dyslipidemia is common in type 2 DM. Glycemic control is poorer and its correlation with lipid profile is stronger in type 2 DM.

Keywords: diabetes mellitus, lipid profile, glycated hemoglobin, dyslipidemia.

Introduction

Prevalence of DM has been steadily increasing in urban as well as rural area of Bangladesh and it will be the major cause death in Bangladesh in 21th century. DM is frequently associated with dyslipidemia and increased percentage of glycated hemoglobin. In patients with type 2 DM are usually dyslipidemic even if under good glycemic control. Dyslipidemia is a risk factor for coronary artery disease, a leading cause of mortality in patients with diabetes mellitus. So frequent and accurate lipid profile and glycated hemoglobin assessment become necessary in diabetes mellitus. To study the lipid profile using direct homogenous method high density lipoprotein cholesterol and low density lipoprotein was calculated by friedwald equation in type-2 diabetes. Serum Triglyceride (TG) Total cholesterol (TC) glycated hemoglobin (GHb) and plasma glucose also assess in those patients. All these parameters were compared in between 50 patient of type 2 diabetes mellitus and control. Level Of all these parameters of lipid profile except HDL cholesterol were significantly raised .and the level of HDL cholesterol was significantly decreased in type 2 DM. Glycated hemoglobin level was significantly positively correlated with total cholesterol and triglycerides in type 2 diabetes mellitus.

Material and Methods

Fifty patient of type 2 diabetes along with fifty control were studied for following parameters.

1. Total cholesterol (TC) by enzymatic end point CHOD-POD method[1].
2. Triacylglycerol (Triglyceride) by enzymatic glycerol phosphate oxidase /peroxidase method[2].
3. LDL cholesterol was calculated by Friedwald equation.

4. Glycated hemoglobin (GHb) by cation exchange resin method[3].

Patients were already diagnosed as diabetes and under treatment in Bogra diabetic hospital and TMSS Medical Collage and hospital, Bogra.

Result

Table 1

Lipid Profile Type -2 DM & Control

Parameters (mg/dl)	Control n=50		Type-2 Dm n=50	
	Range	Mean ± SD	Range	Mean ± SD
TC	130-228	164.38±24.10	212-390	272.66±36.02
TG	58-182	130.32±25.1	152-304	215.04±37.05
HDL-C	36-75	48.54±8.3	27-65	42.62±9.36
LDL-C	50-136	87.38±22.05	121-273	189.46±27.36

Table 2

Fasting and postmeal blood sugar levels and GHb% in controls and cases

Parameters	Control n=50		Type-2DM n=50	
	Range	Mean±SD	Range	Mean±SD
Fasting Blood Sugar (mg/dl)	67-105	87.29±10.28	83-281.2	221.75±34.50
Postmeal Sugar (mg/dl)	118-150	134.10±7.25	165-334.5	268.82±31.51
GHb%	3.7-7.03	5.01±0.84	6.9-13.04	10.09±1.65

Table-1: There were 100 patients enrolled in this study. Table 1 includes the laboratory parameters of the subjects in the study within two groups. One group is Type -2 diabetes mellitus related group and other group is control group had statistically different laboratory result for Total cholesterol (TC), Triglycerides (TG), HDL cholesterol and, LDL cholesterol. This study shows that dyslipidemia is present in type -2 diabetes mellitus.

Table 2: includes the laboratory parameters of the subjects in the study within two groups one group is type -2 diabetes mellitus related group and other group is control group had statistically different laboratory result for fasting blood glucose, post meal blood glucose and this study shows GHb% Glycemic control is poor in type -2 diabetes.

Table 3

Correlation of serum Lipid Profile and GHb%

Groups	Serum TC (mg/dl) Mean±SD	Serum TG (mg/dl) Mean±SD	HDL-C (mg/dl)	LDL-C (mg/dl)	GHb% Mean±SD
Control	164.38±24.10	130.32±25.1	48.54±8.3	87.38±22.05	5.01±0.84
Type-2 DM	272.66±36.02	215.04±37.05	42.62±9.36	189.46±27.36	10.09±1.65

Table 3: shows the correlation of serum lipid profile and GHb% in type -2 diabetes mellitus. In this study correlation of serum total cholesterol and, triglyceride, with GHb% are highly significant whereas correlationf HDL cholesterol and GHb% is insignificant. Glycated hemoglobin level is significantly and positively correlated with TC and TG while GHb has moderately negative correlation with HDL-C in type -2 DM. that means the correlation between GHb% and lipid profile is stronger in type -2 DM.

Discussion

In this study, lipid profile with glycated hemoglobin in type-2 diabetic patient. Present studies focus on the dyslipidemic pattern and its relation with glycated hemoglobin in type-2 diabetes mellitus. These findings are in good agreement with Ladela et al(2006)[4] It was observed that total cholesterol(TC), TG, and LDL-C were significantly increased whereas HDL-C was insignificantly decreased as compared to control These findings are consistent with those of Taha D et al (2002)[5], Howard BVet al (1999)[6], ONeal DN(1998)[7], Mazantoet al (1993)[8], Niemeijeret al and they found that increased TG decreased HDL-C plasma concentration are common features of dyslipidemia in type-2 DM. In this study to assess relation between GHb concentrations in type-2 diabetes mellitus.

GHb level was higher in type-2 diabetes mellitus which is correlated to many workers like palmer AJ et al, VA Fonseca (1998)[9], R paul Wadwa et al (2005)[10]. These Findings of significant positive

correlation between TC and TG with GHb% were in good agreement with those findings of Chairs M Peterson (1977), Brunoet al (1998)[11].

These findings are well correlated with the result obtained by suchanda sahu[12] et aldirect assay, s demonstrate adequate specificity that make useful in subjects with hypercholesterolemia.

From this study, in Type-2 DM, correlation of serum triglyceride and glycated hemoglobin GHb % with both TC and TG are highly significant, but moderately negative correlation between HDL-C and GHb%.

Conclusion

DM is significantly associated with dyslipidemia along with increased GHb level. Early detection and treatment of these conditions prevent complication and further decreases the morbidity and mortality. Thus monitoring the levels of lipids in serum along with glycemic control have diagnostic and prognostic importance in DM

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