Original Article

Lipid Profile of Type 2 Diabetic Patients Attending in a Tertiary Care Medical College Hospital in Dhaka City

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Abstract

Background: Type-2 diabetes mellitus (T2DM) is reported as an independent risk factor for coronary artery disease, which remains 3 to 4-folded riskier for diabetic patients. Previous studies evidenced an association of T2DM with increased risk of cardiovascular diseases (CVDs) which varies among males and females. The present study aims to analyze the lipid profile of T2DM patients and compare the lipid profile of T2DM males and females in Dhaka.

Objective: To compare the difference in serum lipid profile between male and female patients suffering from T2DM.

Methods: This cross-sectional study was conducted at the Department of Biochemistry, Dhaka Medical College Dhaka. In this study we included 100 diagnosed T2DM patients (male, n= 54 and female, n= 46) aged 21 years and above selected from OPD Dept. of Endocrinology, Dhaka Medical College Hospital (DMCH). Fasting plasma glucose (FPG), Total cholesterol (TC), low density lipoproteincholesterol (LDL-C), high density lipoprotein cholesterol (HDL-C) and triglycerides (TG) concentrations values were estimated by enzymatic method. And, values were analyzed for each group which were subjected for statistical analysis using paired students t-test on SPSS/ Win, V. 22,to identify differences in lipid profiles of diabetic males and females. Prior to start the study ethical permission was taken from Ethical Review Committee of DMCH.

Conclusions: Our findings yielded the extent of dyslipidemia among T2DM population remains a major risk factor for CVD, particularly among the T2DM males having higher LDL-C and TG than females. This data suggests that males remain at higher risk to develop CVD than females.

Keywords: Lipid profile, Type-2 diabetes mellitus**.**

Introduction

Diabetes mellitus, particularly Type 2 diabetes mellitus (T2DM) remains one of the predominant forms of diabetes worldwide, including Bangladesh. We report here the lipid profile of T2DM-patients representing from a Tertiary Care Medical College Hospital in Dhaka city, Bangladesh**.**

Globally, the prevalence of diabetes among all age-groups has been estimated as 2.8% in 2000 which raised to nearly double (4.4%) in 2030. It has been reported to be one of the serious health problems being the 3rdgreatest cause of death all over the world, if remain untreated, as reported from Nepal. T2DM is responsible in producing several complications affecting different organs in the body. The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030.[1]

Dyslipidemia has been noted to play an integral role in the pathogenesis and progression of micro and macro vascular complications in Diabetes Mellitus (DM) patients.[2] Total lipid profile/ lipid panel of an individual remains a contributory factor resulting from patient's own blood cholesterol along with its other varieties of associated lipoproteins i.e., high-density lipoproteins (HDL-C or α-lipoproteins), very low-density lipoproteins (VLDL-C or pre-β-lipoproteins) and triglycerides.

Diabetic patients with type 2 diabetes mellitus are at greater risk of developing vascular diseases because of

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lipid changes.[3] Hyperlipidemia is a condition excess of fatty substances called lipids, largely cholesterol and triglycerides, in the blood. It is also called hyperlipoproteinemia because these fatty substances travel in the blood attached to proteins. This is the only way that these fatty substances can remain dissolved while in circulation.[4]

The lowering of LDL cholesterol level leads to reduce the risk of coronary heart disease. The increasing in serum cholesterol levels (HDL) raises the risk of incidence of coronary heart disease. Low HDL-cholesterol increases the risk of cardiovascular disease. Although the correlation between serum cholesterol levels and atherosclerosis diminishes with advancing age, when cholesterol is fractioned into its atherogenic LDL and protective HDL components.[5] Therapeutic inertia with regard to glucose, blood pressure, and lipid management in patients with diabetes has been demonstrated in multiple studies around the world.[6]

Type 2 diabetes mellitus is the predominant form of diabetes mellitus worldwide; thus, this study was conceived to investigate the lipid profile of Type 2 diabetic patients presenting for treatments at a Tertiary Care Medical College Hospital in Dhaka city.

Materials and Methods

This cross-sectional study was conducted in the Department of Biochemistry, Dhaka Medical College, Dhaka. In this study, 100 diagnosed T2DM patients were taken in which 54 T2DM male patients as male (Group A) and 46 T2DM female (Group B) were selected from department of Endocrinology, DMCH.

Individuals aged 21 to 70 years living in Dhaka city were enrolled. fasting plasma glucose (FPG), triglyceride (TG), high density lipoprotein cholesterol (HDL-C), total cholesterol, low density lipoprotein cholesterol was estimated by enzymatic method.

About 5 ml of blood was collected aseptically from each participant after overnight fasting for estimation of TG, T-cholesterol, LDL-c and HDL-c. Biochemical analysis was carried out using auto-analyzer. Fasting blood glucose level >126 mg/dl[7] and diagnosed patient of DM either on hypoglycemic drugs or insulin were included in the study.

Normal ranges for lipid profile were taken as: TG<150 mg/dl; TC<200 mg/dl; HDL>40 mg/dl and LDL<130 mg/dl.[8]All values were statistically analyzed by using the SPSS 22.0 package for windows.

Results:

In present study, 100 patients of Type 2 DM were considered, out of which 54 were males and 46 were females. Biochemical parameters were estimated.

The following table-1 shows that the mean age of male patients was 40.58 ± 7.30 and of female was 38.96 ± 6.40 that did not yield ant difference (p=0.24).

Table I: Age of the study subjects (n=100)

	Male (n=54)	Female (n=46)	p value
Age (years)	40.58 ± 7.30	38.96 ± 6.40	0.240

Group A: Male Diabetic patients. Group B: Female Diabetic patients.
Unpaired't'-test was performed to measure level of significance.
Any p values at <0.05 was considered as significant.

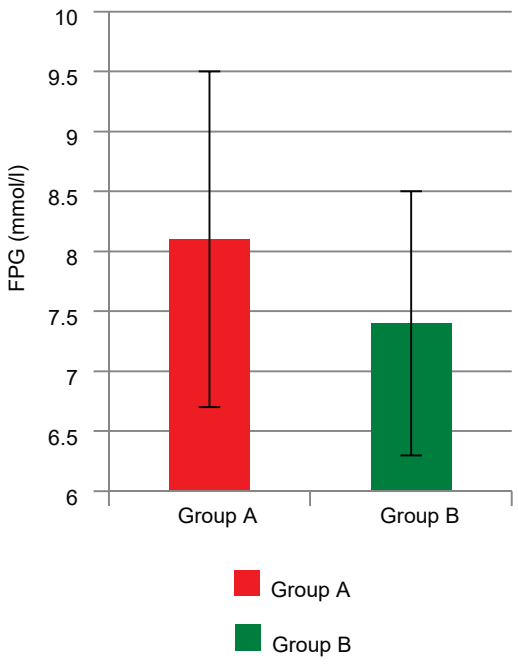

Fig. 1: Bar diagram showing FPG of the study subjects

Figure-1 above demonstrates the level of fasting blood glucose (FBG) shows higher levels both among male and females.

Table II: Distribution of the study subjects by lipid profile (n=100)

Lipid Profile	Group A (n=54) N (%)	Group B (n=46) N (%)	P Value
Total Cholesterol (mg/dl)			
≤200 (normal)	29 (54%)	33 (66%)	< 0.05
> 200	25 (46%)	17 (34%)	
Mean±SD	190.67±21.18	179.25±19.73	
Triglycerides (mg/dl)			
≤150 (normal)	22 (44%)	36 (72%)	< 0.05
> 150	28 (56%)	14 (28%)	
Mean±SD	159.29±17.37	140.42±16.71	
HDL (mg/dl)			
<40	29 (58%)	27 (54%)	> 0.05
> 40 (normal)	21 (42%)	23 (56%)	
Mean±SD	35.45±7.25	38.33±6.26	
LDL (mg/dl)			
≤130 (normal)	30 (60%)	34 (68%)	< 0.05
> 130	20 (40%)	16 (32%)	
Mean±SD	127.23±15.49	119.17±14.89	

t-test was performed to measure the level of significance at p<0.05

Our findings shows that the lipid profile(serum TC, TG and LDL-C) was found to vary significantly: being higher in male (190.67±21.18, 159.29±17.37, and, 127.23±15.49, respectively) than the female ones (179.25±19.73, 140.42±16.71, and, 119.17±14.89, respectively)which differedsignificantly (p<0.05). This interpretations has also been depicted in bar diagram (Fig. 2).

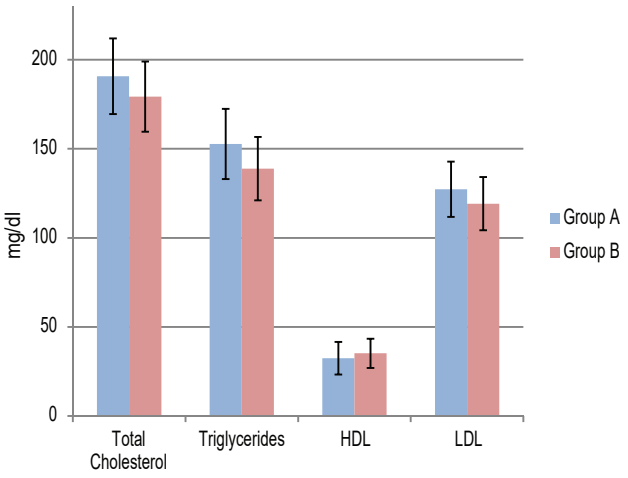

Fig 2: Bar diagram showing lipid profile of the study population

Discussion

Lipid abnormalities are common in diabetics and frequently seen in type-2 diabetics. Dyslipidemias make diabetics prone to develop CHD and other complications of atherosclerosis. In a study conducted in Hazra division, Pakistan the author stated that according to US-CDC, 97% of Pakistani adults with diabetes who had >one lipid abnormalities, with a prevalence of diabetic dyslipidemia varying from 25% to 60%. Patients with type 2 diabetes. Those patients also had other lipid abnormalities, including hyperchylomicronemia, elevated levels of very low-density lipoprotein cholesterol (VLDL-C), low-density lipoprotein cholesterol (LDL-C) and triglycerides; including low levels of high-density lipoprotein cholesterol (HDL-C).[7-9]

However, our findings yielded that fasting plasma glucose level in our study patients was higher in male diabetics compared to female patients but that did not differ significantly (p=0.24).

Contrary to our findings on lipid profile were found significantly higher in males for TC at 190.67±21.18,TG at 159.29±17.37, and LDL-C at 127.23±15.49 than the female Patients being 179.25±19.73, 140.42±16.71 and

119.17±14.89, respectively, differing significantly ($p< 0.05$). But a study in Pakistan conducted in 2016 by Zulfiqar et al. reported type 2 diabetes in 300 patients, where they found higher FPG in females than males though not significantly differed. However, serum TG,TC and LDL–C among their study patients which were elevated among male than females.[10]These observations go with our findings.

Another study by Mouza et al. in 2016 in Fujairah, United Arab Emirates among T2DM patients, where Low level of (HDL-C) was the most common pattern of dyslipidemia but observed more among the in male diabetic patients (55%) followed by elevated triglycerides level (29%)[11]which remains consistent with our study findings.

A cross-sectional study was conducted by Nasir et al.in 2008 in Hazra division, Pakistan in which Among 100 patients with Type 2 Diabetes, 78 were found to have hypertriglyceridemia. Hypertriglyceridemia along with impaired LDL-Cholesterol[9]- which also remained similar to that of our findings. Moreover, another study by Khursheed et al., in Multan, Pakistan on lipid abnormalities reporting higher triglyceride in 31% patients, high LDL in 19%, low HDL in 11%, high cholesterol in 14% and combined hyperlipidemia in male diabetic patients.[12] All these findings remained at par of our findings, though varied a little bit in its percentages. Contrarily, findings of a study from India, by Shyamala et al, in India among 171 T2DM patients (59 females &112 males) revealed that females had higher LDL-C in females than males, while other lipid parameters TC, TG & HDL-C did not differ[13]- which remains consistent with that of ours.

Conclusion:

Findings of this study demonstrated existence of dyslipidemia in T2DM patients which is remains a major risk factor for CVD. We found that TC, TG, LDL-C & lower HDLC were observed more in males compared to that of females suggesting higher CVD-risks. We recommend further multi-center studies involving larger samples before refuting or accepting our findings.

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