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Original Research

To Study Fasting & Postprandial Lipid Abnormality in DM type 2 Patients

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***ABSTRACT*:**

Background: The present study is hospital based observational study was undertaken in Department of Medicine, N.S.C.B. MCH Jabalpur from March 2015 - August 2016. **Method:** Present study includes 100 patients of type 2 diabetes mellitus with abnormal fasting lipid profile (one or more lipid parameter) of which 49 are males and 51 females. **Results:** On applying paired t test in between mean of fasting and postprandial lipid parameters of patients we found that there was significant increase in SCH, LDL, VLDL, Triglycerides, SCH/HDL ratio in Postprandial state as compared to fasting state, p value was <0.05 while there was no significance found in mean value of HDL (P >0.05). **Conclusion:** Diabetes is one of the leading health problems in modern world. Diabetic dyslipidemia contributes to excess morbidity and mortality in Type 2 diabetes mellitus and the abnormal lipid profile in postprandial state is more significant than lipid profile in fasting state as most in causing atherosclerotic complications. Atherosclerosis is a postprandial phenomenon with respect to lipids, as we are in the postprandial phase for most of the day, with an additional adverse effect of the meal induced hyperglycemia. Thus correction in early phase can prevent complications. So in routine practice PP lipid profile along with fasting is warranted.

Keywords: Fasting, Postprandial Lipid Abnormality, DM type 2

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INTRODUCTION

The growing incidence of type 2 diabetes mellitus (T2DM) is a major problem in the modern world. Most individuals with T2DM have insulin resistance and are at increased risk of developing cardiovascular disease (CVD). Diabetic dyslipidemia contributes to the excess morbidity and mortality in T2DM and postprandial triglyceridemia is a distinct component of diabetic dyslipidemia.(1) The abnormal lipid profile in the postprandial state is more significant than the abnormal lipid profile in the fasting state in causing atherosclerotic complications in Type 2 diabetics(2). The high cardiovascular mortality which is associated with Type 2 DM is due to a prolonged, exaggerated, postprandial state.

The predominant lipid abnormalities seen in diabetes mellitus are elevated very low density lipoproteins (VLDL) and total triglycerides (TGs) and a decreased high density lipoproteins (HDL) concentration in the serum(3). Diabetes mellitus describes a metabolic disorder of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. The effects of diabetes mellitus include long-term damage, dysfunction and failure of various organs like retina, heart, kidneys, nerves, blood vessels etc.(4)

MATERIALS & METHOD

The present study is hospital based observational study was undertaken in Department of Medicine, N.S.C.B. MCH Jabalpur from March 2015 - August 2016.

Present study includes 100 patients of type 2 diabetes mellitus with abnormal fasting lipid profile (one or more lipid parameter) of which 49 are males and 51 females.

SAMPLE SIZE:

Sample size was calculated using Right Size (China-Uganda-Zimbabwe) statistical software assuming that (N=4000) i.e. total number of OPD in Dept. of Medicine of NSCB Medical College Jabalpur during reference period where expected frequency of the High risk patients were presumed to be at least 40% (i.e. available prevalence of 20-50%) thus considering 95% confidence level with 80% power and confidence interval of 5%, a sample of 93 patients will be required which includes patients of with high risk. Further there may be chances of patients not available for follow up and not willing to participate in study or drop out with no reason we have added 10% patients in group and thus a round up 100 patients in study group will be taken for the study.

Simple random sampling technique will have used to recruit the patients in this study who were admitted to OPD in Dept. of Medicine of NSCB Medical College Jabalpur.

INCLUSION CRITERIA:

PATIENTS: - All Type 2 diabetic mellitus patients which were in the age group of 35 – 65 years on treatment with OHA and were attending Medicine OPD, diabetic clinic & admitted in Medicine wards.

EXCLUSION CRITERIA:

Type I DM patients
Diabetic patient on hypolipemic drug
Patients on insulin therapy
Gestational Diabetic patients
Patients with thyroid disease
Patient not willing for study

RESULTS

Table 01: Sex wise Distribution of Patients

Sr No	Sex	Total
1	Male	49 %
2	Female	51 %
3	Total	100

Out of 100 diabetic patients in study group 49% were males and 51% was females. On applying chi square test there was no significant difference was found in patients.

Table 02: Comparison of Mean Fasting lipid parameters

Parameters (mg/dl)	SCH	HDL	LDL	VLDL	TG	SCH/HDL
PATIENTS (n=100)	166.17 ±38.77	39.13±8.25	103.17±28.43	31.36±12.9	135.96± 41.29	4.3±0.6
Normal range	<200	40 - 60	<100	<30	<150	<4

Table 03 Comparison of Mean Postprandial lipid parameters

Parameters (mg/dl)	SCH	HDL	LDL	VLDL	TG	SCH/HDL
	215.30±55.01	39.53±9.50	129.52±16.8	42.02±70.32	207.87±1.2	5.52±1.2
Normal range	<200	40 - 60	<100	<30	<150	<4

Table 04: Comparison of Mean lipid parameters in fasting and postprandial state (n=100)

Sr. No.	Parameters (mg/dl)	SCH	HDL	LDL	VLDL	TG	SCH/HDL
1	FASTING	166.17 ±38.77	39.13±8.25	103.17±28.43	31.36±12.9	135.96±41.29	4.30±0.9
2	POST PRANDIAL	215.30±55.01	39.53±9.50	129.52±37.68	42.02±16.8	207.87±70.32	5.52±1.2
3	P VALUE	<0.05	>0.05	<0.05	<0.05	<0.05	<0.05

On applying paired t test in between mean of fasting and postprandial lipid parameters of patients we found that there was significant increase in SCH, LDL, VLDL, Triglycerides, SCH/HDL ratio in Postprandial state as compared to fasting state, p value was <0.05 while there was no significance found in mean value of HDL (P >0.05).

Table 05: Mean of FBS and PPBS HbA1c and Waist to hip ratio in patients

Sr no	Parameter	PATIENTS (n=100)
1	Fasting blood Sugar	142.09+45.86
2	Postprandial blood sugar	212.35+67.97
3	HbA1c	8.70+1.5
4	Waist to hip Ratio	0.96+0.02

Table 06: Macro and micro vascular complication found in diabetes patients

Study Group	Ischemic heart disease	Peripheral vascular disease	Cerebro vascular stroke	Peripheral neuropathy	Diabetic retinopathy	Nephropathy
Patients (n=100)	28 (28%)	13 (13%)	23(23%)	63(63%)	46(46%)	55(55%)

DISCUSSION

The present Study comprises 49 male patients & 51 female patients while sex distribution of patients (n=100) was slightly higher in females (n=51, 51%) as compared to males (n=49, 49%) respectively.

In present study in postprandial state we found lipid parameter was significantly elevated in patients. There was significant elevation of SCH, LDL, TG and VLDL ($P<0.05$) in patients; finding was consistent with study carried out by suryabhan l, et al (2015), et al(2,5) and also result was consistent with study carried out by Vinod V Wali, et al (2016) (6) but in both these studies they have taken controls as healthy non-diabetics. In present study we found prevalence of neuropathy found in (n=63/100) 63% In study carried out by Lokhande Suryabhan, et al (2015) (7) the study included 1,637 known diabetes mellitus and 369 newly detected diabetes mellitus patients. Out of which 586 participants were found to have diabetic peripheral neuropathy, accounting for (n=586/2006) 29.2% prevalence. The higher prevalence was observed in known diabetes mellitus compared with newly detected diabetes mellitus 33.7 vs 9.2% ($P < 0.001$). In present study we found overall prevalence of diabetic retinopathy (n=46/100) 46%. In study carried out by Salil S Gadkari, et al (2016) (8) they found diabetic retinopathy prevalence in the entire data set was 21.7%. Prevalence was more in males ($P = 0.007$), diabetics more than 5 years ($P = 0.001$), those above 40 years ($P = 0.01$), insulin users ($P = 0.001$), and history of vascular accidents ($P = 0.0014$). Prevalence diabetic retinopathy was found in range of 10-60% in different studies, result of present study was consistent with different studies. In present study we found prevalence of diabetic nephropathy was (n=55/100) 55% patients. In other study by Raja Vinod V et al (2013). The prevalence of overt nephropathy was 9.27% in males and 6.73% in females.(10) In study carried out by Singh, G, et al (2011) (11) results revealed that out of Five hundred type-2 diabetic patients; 168 (33.5%) had diabetic nephropathy, 106 (21.2%) of them had macroalbuminuria and 62 (12.4%) had microalbuminuria. In present study prevalence of IHD was (n=28/100) 28% patients. In study carried out in 100 newly diagnosed DM 2 patients they found prevalence of Coronary Artery Disease as 26%.(72) Result of present study was consistent with different other studies while some studies have less prevalence than present study. In present study prevalence of peripheral vascular disease (PVD) was (n=13/100) 13% patients.) In study carried out in Bellary, Karnataka in 100 newly diagnosed DM 2 patients they found prevalence of PVD 11%. In present study prevalence we found cerebrovascular accident (CVA) was (n=23/100) 23% patient, while study carried out by Jasminka Djelilovic-Vranic, et al (2013) (12) stroke was confirmed in 1184 patients with DM type 2 in which Ischemic stroke was confirmed in 78.0% and hemorrhagic in 22%.(12) Results of present study was consistent with other studies.

Although obesity and T2DM commonly co-exist Lifestyle changes, including increased physical activity and dietary modifications, are the milestones of management. There is need for increased efforts by family members, community and healthcare professionals towards preventive based approach in the management of diabetes.(13) This can be achieved through increased emphasis on lifestyle modification strategies such as exercise, increased dietary restrictions and weight control strategies especially for those with impaired fasting glucose. Monitoring of lipid profile by blood tests done in regular intervals also might play an important role to detect and take care of lipid abnormalities both in diabetics and non-diabetics. Results suggest a high prevalence of dyslipidemia, which might be playing a major role in the development of microvascular and macrovascular complication among diabetic patients. The optimal care for diabetic patients should include routine monitoring of blood glucose and serum fasting lipid profile as well as post prandial lipid profile.

CONCLUSION

Diabetes is one of the leading health problem in modern world. Diabetic dyslipidemia contributes to excess morbidity and mortality in Type 2 diabetes mellitus and the abnormal lipid profile in postprandial state is more significant than lipid profile in fasting state as most in causing atherosclerotic complications. Atherosclerosis is a postprandial phenomenon with respect to lipids, as we are in the postprandial phase for most of the day, with an additional adverse effect of the meal induced hyperglycemia.

In our study we found that there was very high occurrence of fasting and postprandial dyslipidemia in patients having diabetes and when we compared postprandial dyslipidemia with fasting dyslipidemia in diabetic patients we found that postprandial dyslipidemia was significantly higher than fasting dyslipidemia.

So, routine follow-up of postprandial dyslipidemia in diabetes may help in early diagnosis and prompt management of various vascular complications which in turn can lead to improved quality of life.

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