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THE PREVALENCE AND PATTERN OF DYSLIPIDEMIA AMONG PATIENTS OF TYPE 2 DIABETES MELLITUS

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ABSTRACT

Background: Diabetes mellitus is a leading cause of dyslipidemia, particularly in individuals with poor blood sugar control, which finally precipitate as an important risk factor for developing atherosclerosis and coronary heart disease and other macrovascular complications. Dyslipidemia, especially in individuals with raised blood sugar levels, is an important risk factor for developing micro and macro vascular complications. **Material & Methods:** Patients who were between 30-80 years of age with type 2 diabetes mellitus randomly selected irrespective of duration of diabetes were enrolled from outdoor department and from ward by simple random sampling. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent for the procedure was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time. **Results:** The magnitude of dyslipidemia in our study was 72%. Out of total 56 males 40 Male patients found to had dyslipidemia, i.e. the prevalence of dyslipidemia in males was 71.4% whereas 32 out of 44 female patients had dyslipidemia i.e. the magnitude of dyslipidemia among female DM patients was 72.7%. However, this difference was statistically non-significant (P value > 0.05). In the present study, out of the total study participants, 16% had well controlled diabetes mellitus (HbA1C less than 7) and 84% patients had poorly controlled diabetes mellitus (HbA1C more than 7). There was a significant association between prevalence of dyslipidemia and glycemic control (p value < 0.05). Dyslipidemia was more common in patients with uncontrolled diabetic status. **Conclusion:** The present study reported the burden of dyslipidemia in patients with type 2 diabetes mellitus patients and that there was a highly significant association of associated poor glycemic control (HbA1C more than 7) with serum lipid parameters. Hence serum lipid profile must be done annually in all cases with diabetes.

Keywords: Diabetes mellitus, Lipid profile, Dyslipidemia.

INTRODUCTION:

Hepatitis The global prevalence of diabetes is growing very fast almost unquestionably and it can be associated with an inexorable and parallel increase in the long-term complications that are associated with diabetes **(1)**. The worldwide total case burden of diabetes mellitus is rapidly growing like an epidemic and it is occurring in all proportions around the globe. The worldwide prevalence of both types of diabetes mellitus among adults is approximate around 7.2% and this is affecting 322 million people in 2012 and

is expected to raise to seventh leading cause of death by the 2030 **(2).**

Abnormalities in serum lipids associated with diabetes mellitus are termed as dyslipidemia rather than hyperlipidemia because it was observed that there may be changes in both quality and quantity of the serum lipoproteins. Diabetes mellitus (DM) is a leading cause of dyslipidemia, particularly in individuals with poor blood sugar control, which finally precipitate as an important risk factor for developing atherosclerosis and coronary heart disease and other macrovascular complications **(3).**

Diabetes mellitus threatens to decrease life expectancy and increase the morbidity and mortality as a consequence of its complications which are further divided as macro vascular and micro vascular complications **(4)**. The main leading causative factor for diabetes mellitus related mortality are due to these macro vascular and micro vascular complications **(5).**

The role of raised serum lipoproteins in macro vascular complications is well established. But their role in micro vascular complications has not been studied extensively. Therefore, the present study was focused on to study serum lipid levels in patients with type 2 diabetes mellitus and the prevalence and pattern of dyslipidemia among patients of type 2 diabetes mellitus at our tertiary care hospital.

MATERIALS & METHODS

The present cross sectional, observational study was conducted at of our tertiary care hospital, with a study duration of six months from January 2016 to June 2016. A sample size of 100 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.2. 100 patients who were between 30-80 years of age with type 2 diabetes mellitus randomly selected irrespective of duration of diabetes were enrolled from outdoor department and from ward by simple random sampling. Institutional Ethics Committee Clearance was obtained before start of study and written and informed consent for the procedure was obtained from all the patients. Strict confidentiality was maintained with patient identity and data and not revealed, at any point of time.

General physical examination and detailed history was taken from all study participants. Patients with Hypertension, patients on lipid lowering agents and patients on medications which alter lipid profile and patients with BMI> 30 kg/m2 were excluded from the study. Fasting and post prandial blood sugar, fasting lipid profile was done. Low density lipoprotein cholesterol (LDL-C) ,Glycosylated hemoglobin (HbA1c) and TG, TC, HDL-C levels were estimated because of the targets recommended by American Diabetes Association (ADA) were considered to classify as dyslipidemia which includes TG≥150 mg/dl, LDL≥ 100mg/dl,

HDL≤40 mg/dl in males and ≤50 mg/dl in females and TC> 200 mg/dl **(6)**. In present study, various descriptive and inferential statistics have been calculated. Chi-square test has been applied for the comparison in different groups. On follow up visit same data were recorded and compared. All the data was recorded on Microsoft excel spread sheet and data analysis was done at 10% alpha and 90% confidence interval using SPSS v22 software. Test of significance were applied on collected and organized data and p value less than 0.05 was considered as statistically significant association between study variables.

RESULTS

In present study we randomly selected 100 patients who were between 30-80 years of age with type 2 diabetes mellitus randomly selected irrespective of duration of diabetes were enrolled from outdoor department and from ward by simple random sampling. Out of these 100 diabetic patients, 56 were Males and 44 were Females. The Mean age of patients in our study was 46.9 ± 10.6 years. Mean duration of diabetes mellitus was 7.38 ± 3.2 years. Mean HbA1C was 8.23 ± 2.4. Mean FBS was 157.6 ± 28.7 mg/dl and mean PPBS was 288.9 ± 54.3 mg/dl. (Table 1)

The magnitude of dyslipidemia in our study was 72%. Out of total 56 males 40 Male patients found to had dyslipidemia, i.e. the prevalence of dyslipidemia in males was 71.4% whereas 32 out of 44 female patients had dyslipidemia i.e. the magnitude of dyslipidemia among female DM patients was 72.7%. However, this difference was statistically non-significant (P value > 0.05). (Table 2)

Table 1: Distribution of study subjects according to study parameters.

Parameters		**No. of patients**
Mean age (years)		46.9 ± 10.6
Gender	Male	56%
	Female	44%
Mean duration of diabetes (years)		7.38 ± 3.2
Mean HbA1C levels		8.23 ± 2.4
Mean FBS		157.6 ± 28.7 mg/dl
Mean PPBS		288.9 ± 54.3 mg/dl

In the present study, most common pattern of serum lipid abnormality was combined dyslipidemia. That was of raised triglycerides and low serum HDL-C levels were the most common pattern among both males and females. Second most common pattern of serum lipid profile was the isolated dyslipidemia in which

Low levels of serum HDL-C were found among both males and females. (Table 3)

Table 2: Distribution of study subjects according to study parameters.

Parameters		Prevalence of dyslipidemia	P value
Study participants		72%	
Gender	Male	71.4%	> 0.05
	Female	72.7%	

Table 3: Distribution of study subjects according to mean values of lipid parameters.

Lipid parameter	Mean +SD
Total cholesterol	190.2 ± 45.4
HDL-C	34.4 ± 4.6
LDL-C	126.8 ± 30
Triglycerides	221.7 ± 63.5

In the present study, out of the total study participants, 16% had well controlled diabetes mellitus (HbA1C less than 7) and 84% patients had poorly controlled diabetes mellitus (HbA1C more than 7). There was a significant association between prevalence of dyslipidemia and glycemic control (p value < 0.05). Dyslipidemia was more common in patients with uncontrolled diabetic status. (Table 4)

Table 4: Distribution of study subjects according to association of dyslipidemia with HBA1C.

	Well controlled diabetes (Hba1c < 7)	Poorly controlled diabetes (Hba1c > 7)	P value
Dyslipidemia	7 %	78 %	<0.05
Normal lipid profile	9 %	6 %	

DISCUSSION

In present study we randomly selected 100 patients who were between 30-80 years of age with type 2 diabetes mellitus randomly selected irrespective of duration of diabetes were enrolled from outdoor department and from ward by simple random sampling. Out of these 100 diabetic patients, 56 were Males and 44 were Females. The Mean age of patients in our study was 46.9 ± 10.6 years. Mean duration of diabetes mellitus was 7.38 ± 3.2 years. Mean HbA1C was 8.23 ± 2.4. Mean FBS was 157.6 ± 28.7 mg/dl and mean PPBS was 288.9 ± 54.3 mg/dl. Similar

results were observed in a study conducted by yadav NK et al among patients of type 2 diabetes mellitus **(7).**

The magnitude of serum dyslipidemia in Diabetes Mellitus patients in present study was found to be 72%. This finding was nearly similar to studies done by yadav NK et al **(7)** and Hetal Pandya, et al **(8)** Which showed prevalence of 70% and 72%, respectively. In contrast to that Daniel Nii Aryee Tagoe, et al **(9)** which showed prevalence of 93% of cases had dyslipidemia in compared to controls (23%). There was no statistically significant difference found among males and groups in the magnitude of dyslipidemia (P value > 0.05). Most common pattern of serum lipid profile was combined dyslipidemia with low HDL-C levels and high triglycerides (TG) levels among both males and females in present study. Similar results observed in a study done by Jayarama N et al and found that combined dyslipidemia affecting 26% females and 29% male patients **(10).**

In contrast to that a study done by Jayarama N, et al. found that most common pattern of dyslipidemia in both males (44.2%) and females (42.97%) was combined dyslipidemia **(10).** In the present study, second most Common pattern of dyslipidemia in present study was isolated Low HDL-C levels affecting 20 % female patients and 22 % of male patients. In context with present study, another study conducted by Jayarama N, et al. found that second most common pattern of serum lipid profile among diabetic patients was isolated low HDL levels affecting 17.09% males and 12.85% females. These results were in comparison and nearly similar to present study **(10).**

In the present study, out of the total study participants, 16% had well controlled diabetes mellitus (HbA1C less than 7) and 84% patients had poorly controlled diabetes mellitus (HbA1C more than 7). There was a significant association between prevalence of dyslipidemia and glycemic control (p value < 0.05). Dyslipidemia was more common in patients with uncontrolled diabetic status. We found highly significant association (p value < 0.05) of poor glycemic control (HbA1C more than 7) with High LDL-C, High TG and High TC levels. Similar result obtained in a study conducted by Toth PP et al found that increase in HDL-C levels were associated poor glycemic control (HbA1C more than 7) (P< .0001) and for LDL-C, TG, and non-HDL-C levels increase resulted in increases of micro and macro vascular complications risk **(11).** Similar results were also obtained in studies done by Ram Vinod Mahato et al **(12)** and Prashant Tayde et al **(13).**

CONCLUSION

The present study reported the burden of dyslipidemia in patients with type 2 diabetes mellitus patients and that there was a highly significant association of associated poor glycemic control (HbA1C more than 7) with

serum lipid parameters. Hence serum lipid profile must be done annually in all cases with diabetes. As we know Diabetes mellitus is associated with High TC, TG and LDL-C, patients should managed firstly with life style modifications with lipid lowering medication to achieve target values along with adequate blood sugar control.

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