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ROLE OF SERUM LIPID PROFILE IN OCCURRENCE OF DIABETIC NEPHROPATHY?

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ABSTRACT

Background: The prevalence of non-communicable diseases is increasing compared to communicable diseases. Among the non-communicable diseases, diabetes mellitus is rapidly increasing globally and affecting all the age groups. Diabetes is a chronic disease in etiology and occurs when the pancreas does not produce enough amount of insulin or when there is resistance towards its action on the body. **Material & Methods:** In the present study a total 200 patients with type 2 diabetes mellitus and confirmed with laboratory investigations were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant. **Results:** The mean value of total cholesterol among study participants was 194.2 ± 36.4 mg/dl, mean value of HDL- cholesterol was 32.4 ± 6.2 mg/dl, mean value of LDL- cholesterol was 112.8± 42.5 mg/dl and mean value of Serum triglycerides was 201.6 ± 58.7 mg/dl. 32 (16%) diabetes patients had diabetic Nephropathy. On the estimation of GFR, it was found that Out of total diabetic patients, 168 (84%) diabetic patients had GFR > 90 ml/min/1.73 m2, 30 (15%) diabetic patients had GFR of 60-90 ml/min/1.73m2 and 02 (1%) diabetic patients had GFR < 60 ml/min/1.73 m2. There was a significant association found between High LDL-cholesterol, High serum triglycerides and High total cholesterol levels. (p value < 0.05). **Conclusion:** We concluded from the present study that there was a significant association was found between dyslipidemia and diabetic nephropathy in patients with type 2 diabetes mellitus. Hence, serum lipid profile should be assessed annually among all the patients of diabetes.

Key words: Diabetes mellitus, Diabetic nephropathy, Dyslipidemia.

INTRODUCTION

The prevalence of non-communicable diseases is increasing compared to communicable diseases. Among the non-communicable diseases, diabetes mellitus is rapidly increasing globally and affecting all the age groups. Diabetes is a chronic disease in etiology and occurs when the pancreas does not produce enough amount of insulin or when there is resistance towards its action on the body. In 2014, WHO reports that 8.5% of adults who aged 18 years or above had diagnosed with diabetes. In 2016, WHO reports that diabetes was the directly responsible for 1.6 million mortality occurred worldwide. It was estimated that by the year 2030 diabetes will became seventh leading cause of mortality worldwide **(1)**.

In India, the prevalence of diabetes is increasing and imposing challenges on health care infrastructure of the country. The overall prevalence of diabetes reported by WHO was 8.7% among the age group of 20 and 70 years. This rising prevalence depends on

various factors such as, sedentary lifestyles, rapid urbanization, unhealthy diets and substance use/abuse along with increasing life expectancy. Obesity and overweight are also the most important associated risk factors. The onset of diabetes can be prevented or delayed by life style and behavioral changes by taking healthy diet and routine physical activity **(2)**.

The diabetes has several microvascular and macrovascular complications which are responsible for several serious complications. Dyslipidemia in diabetes characterized by abnormalities in patient's lipid profile associated with changes in quantity and quality of serum lipoproteins. These changes in serum lipoproteins leads to vascular complications such as coronary heart disease, atherosclerosis and several other macrovascular complications. Diabetes mellitus is most common leading cause of end stage renal disease. Diabetic nephropathy is accounts for mortality and morbidity among more than 20% of patients with diabetes mellitus **(3)**. Hence, the association of dyslipidemia in macro vascular complications has been well studied. Therefore, we conducted the present study to elaborate and find the role of serum lipid profile among the cases of diabetic nephropathy.

MATERIALS & METHODS

The present prospective study was conducted at department of general medicine of Pacific Institute of Medical Sciences, Udaipur. The study duration was of one year from Oct. 2016 to Nov. 2017. A sample size of 200 was calculated at 95% confidence interval at 10% acceptable margin of error by epi info software version 7.2. Patients who were presenting with type 2 diabetes mellitus and confirmed with laboratory investigations were enrolled from outdoor and from ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before start of study. Written informed consent was taken from each study participant.

The data were collected by detailed history, general physical and clinical examination from each patient after taking the written consent. The hematological investigation was done for fasting and post prandial blood sugar, glycosylated hemoglobin (HbA1c), fasting lipid profile, 24 hour urine protein, serum creatinine levels, spot urine albumin levels and spot urine albumin creatinine ratio. Dyslipidemia was considered if the values of, TG≥150 mg/dl, S. LDL≥ 100mg/dl, S. HDL value ≤40 mg/dl (male) and ≤50 mg/dl (female) and TC more than 200 mg/dl (4). GFR estimation was done by using Crockroft-Gault equation. Patients who had hypertension, patients taking drugs for lipid lowering or drugs which can alter lipid profile and BMI> 30 kg/m2 were excluded from the present study. Data analysis was carried out using SPSS v22. All tests were done at alpha (level significance) of 5%; means a significant association present if p value was less than 0.05.

RESULTS

In the present study we enrolled 200 patients of diabetes mellitus who were aged from 28 to 60 years. The mean age of the enrolled patients was 38.91 ± 7.56 years. Out of total patients diagnosed with diabetes mellitus 116 (58%) patients were male and 84 (42%) patients were females. On the detailed history and laboratory investigation it was found that mean duration of diabetes mellitus was 5.64 ± 4.23 years. Mean level of HbA1C was 8.45 ± 1.69. We found the mean fasting blood sugar was 167.6 ± 21.2 mg/dl and mean post prandial blood sugar was 265.7 ± 32.6 mg/dl. The dyslipidemia was found among 114 (57%) patients in our study and it was found that 32 out of 116 males and 25 out of 84 females were diagnosed with dyslipidemia, i.e. the prevalence of dyslipidemia among males was 27.6% whereas among females it was 29.8%. (Table 1)

Table No.-1: Distribution of patients according to study parameters.

Study parameters	No. of Patients (%)
Male	116 (58%)
Female	84 (42%)
Mean age	38.91 ± 7.56 years
Mean duration of diabetes mellitus	5.64 ± 4.23 years
Mean HbA1C	8.45 ± 1.69
Mean fasting blood sugar	167.6 ± 21.2 mg/dl
Mean post prandial blood sugar	265.7 ± 32.6 mg/dl
Prevalence of dyslipidemia	114 (57%)

In the present study, combined serum lipid profile abnormalities were found among majority of

dyslipidemia patients. Among the patients with combined dyslipidemia, we found raised serum triglycerides and low HDL- cholesterol levels in higher frequencies among both males and females. This abnormality in serum lipid profile is followed by isolated dyslipidemia associated with decreased levels of HDL- cholesterol among both males and females. The mean value of total cholesterol among study participants was 194.2 ± 36.4 mg/dl, mean value of HDL- cholesterol was 32.4 ± 6.2 mg/dl, mean value of LDL- cholesterol was 112.8± 42.5 mg/dl and mean value of Serum triglycerides was 201.6 ± 58.7 mg/dl. We found a statistically significant association control (p value < 0.05) with dyslipidemia and HbA1C more than 7 (poorly controlled diabetes mellitus). (Table 2)

Table No.-2: Mean values of serum lipid profile in our study.

Lipid parameter	Mean +SD
Total cholesterol	194.2 ± 36.4 mg/dl
HDL- cholesterol	32.4 ± 6.2 mg/dl
LDL- cholesterol	112.8± 42.5 mg/dl
Serum triglycerides	201.6 ± 58.7 mg/dl

In present study, out of total two hundred enrolled study participants, 32 (16%) diabetes patients had diabetic Nephropathy. Out of these 32 (16%) diabetic nephropathy patients 28 (14%) presented with micro albuminuria and 04 (2%) presented with macro albuminuria. On the estimation of GFR, it was found that Out of total diabetic patients, 168 (84%) diabetic patients had GFR > 90 ml/min/1.73 m2, 30 (15%) diabetic patients had GFR of 60-90 ml/min/1.73m2 and 02 (1%) diabetic patients had GFR < 60 ml/min/1.73 m2. There was a significant association found between High LDL-cholesterol, High serum triglycerides and High total cholesterol levels. (p value < 0.05). (Table 3)

Table No.-3: Distribution of patients according to study parameters

Study parameters	No. of Patients (%)
Diabetic Nephropathy	32 (16%)
micro albuminuria	28 (14%)
macro albuminuria	04 (2%)
GFR > 90 ml/min/1.73 m2	168 (84%)
GFR - 60-90 ml/min/1.73m2	30 (15%)
GFR < 60 ml/min/1.73 m2	02 (1%)

DISCUSSION

In the present study we enrolled 200 patients of diabetes mellitus who were aged from 28 to 60 years. The mean age of the enrolled patients was 38.91 ± 7.56 years. Out of total patients diagnosed with diabetes mellitus 116 (58%) patients were male and 84 (42%) patients were females. On the detailed history and laboratory investigation it was found that mean duration of diabetes mellitus was 5.64 ± 4.23 years. Mean level of HbA1C was 8.45 ± 1.69. We found the mean fasting blood sugar was 167.6 ± 21.2 mg/dl and mean post prandial blood sugar was 265.7 ± 32.6 mg/dl. The dyslipidemia was found among 114 (57%) patients in our study and it was found that 32 out of 116 males and 25 out of 84 females were diagnosed with dyslipidemia, i.e. the prevalence of dyslipidemia among males was 27.6% whereas among females it was 29.8%. Similar results to the present study was found in a study conducted by yadav NK et al among patients of type 2 diabetes mellitus to found the association between serum dyslipidemia and diabetic nephropathy and they found the overall prevalence of serum dyslipidemia was 70% (5). Similar results to the present study was found in a study conducted by Hetal Pandya et al et al among patients of type 2 diabetes mellitus to found the association between serum dyslipidemia and diabetic nephropathy and they found the overall prevalence of serum dyslipidemia was 72% **(6)**.

In the present study, combined serum lipid profile abnormalities were found among majority of dyslipidemia patients. Among the patients with combined dyslipidemia, we found raised serum triglycerides and low HDL- cholesterol levels in higher frequencies among both males and females. This abnormality in serum lipid profile is followed by

isolated dyslipidemia associated with decreased levels of HDL- cholesterol among both males and females. The mean value of total cholesterol among study participants was 194.2 ± 36.4 mg/dl, mean value of HDL- cholesterol was 32.4 ± 6.2 mg/dl, mean value of LDL- cholesterol was 112.8± 42.5 mg/dl and

mean value of Serum triglycerides was 201.6 ± 58.7 mg/dl. We found a statistically significant association control (p value < 0.05) with dyslipidemia and HbA1C more than 7 (poorly controlled diabetes mellitus). Similar results to the present study was found in a study conducted by Daniel Nii Aryee Tagoe et al et al among patients of type 2 diabetes mellitus to found that the overall prevalence of serum dyslipidemia was 93%. They found raised serum triglycerides and low HDL- cholesterol levels in higher frequencies among both males and females **(7)**. Similar results to the present study was found in a study conducted by Jayarama N et al et al among patients of type 2 diabetes mellitus to found that combined serum lipid profile abnormalities among majority of patients **(8)**.

In present study, out of total two hundred enrolled study participants, 32 (16%) diabetes patients had diabetic Nephropathy. Out of these 32 (16%) diabetic nephropathy patients 28 (14%) presented with micro albuminuria and 04 (2%) presented with macro albuminuria. On the estimation of GFR, it was found that Out of total diabetic patients, 168 (84%) diabetic patients had GFR > 90 ml/min/1.73 m2, 30 (15%) diabetic patients had GFR of 60-90 ml/min/1.73m2 and 02 (1%) diabetic patients had GFR < 60 ml/min/1.73 m2. There was a significant association found between High LDL-cholesterol, High serum triglycerides and High total cholesterol levels. (p value < 0.05). Similar results to the present study was found in a study conducted by Vinod M R et al et al among patients of type 2 diabetes mellitus **(9)**. Similar results to the present study was also found in a study conducted by Prashant Tayde et al et al among patients of type 2 diabetes mellitus **(10)**. Similar results to the present study was also found in a study conducted by Kanakamani J et al et al among patients of type 2 diabetes mellitus and found that microalbuminuria among 24 % diabetic patients and macroproteinuria among 6% diabetic patients **(11)**. Similar results to the present study was also found in a study conducted by Macisaac RJ and Jerums G among patients of type 2 diabetes mellitus and found that 20 % patients have GFR <60ml/min/1.73m2 **(12)**. Similar results to the present study was also found in a study conducted by Toth PP among patients of type 2 diabetes mellitus and found that dyslipidemia is significantly associated with diabetic nephropathy **(13)**.

CONCLUSION

We concluded from the present study that there was a significant association was found between dyslipidemia and diabetic nephropathy in patients with type 2 diabetes mellitus. Hence, serum lipid profile should be assessed annually among all the patients of diabetes. Screening for Diabetic Nephropathy done by estimation of urinary albumin and creatinine.

REFERENCES

1. Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. Diabetes Res Clin Pract. 2010 Jan;87(1):4–14.
2. Cheung BMY, Li C. Diabetes and hypertension: is there a common metabolic pathway? Curr Atheroscler Rep. 2012 Apr;14(2):160–6.
3. Kazancioğlu R. Risk factors for chronic kidney disease: an update. Kidney Int Suppl. 2013 Dec;3(4):368–71.
4. Eldor R, Raz I. American Diabetes Association indications for statins in diabetes: is there evidence? Diabetes Care. 2009 Nov;32 Suppl 2(Suppl 2):S384-91.
5. Yadav NK, Thanpari C, Shrewastwa MK, Mittal RK. Comparison of lipid profile in type-2 obese diabetics and obese non-diabetic individuals. a hospital based study from Western Nepal. Kathmandu Univ Med J (KUMJ);10(39):44–7.
6. Pandya H, Lakhani J, Dadhania J, Trivedi A. The Prevalence and Pattern of Dyslipidemia among Type 2 Diabetic Patients at Rural Based Hospital in Gujarat, India. 2012;
7. Tagoe D, Research PA-K-A of B, 2013 undefined. Type 2 diabetes mellitus influences lipid profile of diabetic patients. researchgate.net;

8. Jayarama N, Reddy M RS. Prevalence and pattern of dyslipidemia in type 2 diabetes mellitus patients in a rural tertiary care centre, southern India. Glob J Med Public Heal. 2012;1(1):24–8.

9. VinodMahato R, Gyawali P, Raut P. Association between glycaemic control and serum lipid profile in type 2 diabetic patients: Glycated haemoglobin as a dual biomarker. biomedres.info. 2011;22(3):375–8.

10. Tayde P, Borle A, Zanwar Y. Glycated hemoglobin pattern and its correlation with lipid profile in type-2 diabetic males in central India. njcmindia.org. 2013;4(4):564–9.

11. Kanakamani J, Ammini AC, Gupta N, Dwivedi SN. Prevalence of Microalbuminuria Among Patients with Type 2 Diabetes Mellitus—A Hospital-Based Study from North India. Diabetes Technol Ther. 2010 Feb;12(2):161–6.

12. MacIsaac RJ, Jerums G. Diabetic kidney disease with and without albuminuria. Curr Opin Nephrol Hypertens. 2011 May;20(3):246–57.

13. Toth PP, Simko RJ, Palli S, Koselleck D, Quimbo RA, Cziraky MJ. The impact of serum lipids on risk for microangiopathy in patients with type 2 diabetes mellitus. Cardiovasc Diabetol. 2012 Sep 14;11(1):109.

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