



FREQUENCY OF DYSLIPIDEMIA IN PATIENTS WITH TYPE II DIABETES MELLITUS PRESENTING IN DHQ TEACHING HOSPITAL, SAHIWAL.

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ABSTRACT... Dyslipidemia is major risk factor for cardiovascular disease in diabetes mellitus (DM). Early detection and treatment of dyslipidemia in type 2 DM can prevent the risk for atherosclerosis. **Objectives:** To determine the frequency of dyslipidemia in patients with type 2 diabetes mellitus presenting in DHQ Teaching Hospital, Sahiwal for routine check-up. **Study Design:** Cross Sectional, Observational, Descriptive study. **Setting:** Medical Unit 1, DHQ Teaching Hospital, Sahiwal, Pakistan. **Period:** 05-05-2018 to 05-11-2018. **Material & Methods:** Total 180 patients fulfilling selection criteria were enrolled in the study. Blood samples were obtained and sent to the Pathology Laboratory of the hospital for assessment of lipid profile. Reports were assessed and if cholesterol >200mg/dl and triglyceride >150mg/dl, then dyslipidemia was labeled. All this information was recorded on pro-formas. **Results:** In this study dyslipidemia was diagnosed in 81 (45%) patients. Frequency of dyslipidemia was higher in age group 51-60 years (44.4%) as well as among female patients (56.8%). Overweight patients and patients with normal BMI had the highest frequency of dyslipidemia. **Conclusion:** the results of this study showed high frequency of dyslipidemia among type II diabetic patients. Type II diabetes is very much common in our population so there is a need to design screening programs in which blood lipid levels screening should be monitored on regular intervals to rule out dyslipidemia timely and for effective and proper management with statin therapy.

Key words: Cardiovascular Disorders, Dyslipidemia, Lipid Profile, Type II Diabetes Mellitus.

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INTRODUCTION

Type II diabetes mellitus and its complications are the major and growing public health problem around the world including developing countries.¹ The frequency of Type II diabetes is increasing at a fast pace in South Asian countries due to high level of Insulin resistance, upper body adiposity, high genetic predisposition, a high body fat percentage, high level of insulin resistance and higher BMI in general population.²

Diabetes is associated with high incidence of dyslipidemia with elevated level of low density lipoprotein (LDL), cholesterol and triglyceride.³ Presence of lipoprotein disorders is a very common finding in diabetic patients and is the major contributor to the morbidity and mortality from cardiovascular diseases. According to ATP

111 guidelines, diabetic dyslipidemia is defined by the presence of high serum total cholesterol, high serum triglyceride, high LDL and low serum HDL in Type II diabetes patients.⁴

Dyslipidemia is major risk factor for cardiovascular disease in Type 2 diabetes. Early detection and treatment of dyslipidemia in Type 2 diabetes can prevent risk for atherosclerosis.²

In Nepal, the prevalence of dyslipidemia among Type II diabetes patients was 85.33%.⁵ In Rawalpindi, the frequency of dyslipidemia was 80% among diabetic patients.⁶ In DG Khan, it was observed among diabetic patients dyslipidemia was found in 74% patients.⁷ Mehmood F et al., found in Multan that dyslipidemia is present in 81.5% diabetic patients.⁸ While one study

conducted in Faisalabad, the frequency of dyslipidemia was found in 17% among diabetic patients.⁹

Rationale of this study is to determine the frequency of dyslipidemia in patients with Type 2 DM presenting in a tertiary care hospital for routine check-up. Through literature, it has been noticed that the risk of dyslipidemia is very high in patients of Type 2 DM. But controversial results have been noticed in locally conducted studies as mentioned above. Moreover, there is no study found that would be conducted in Sahiwal region. So we want to conduct this study to find the extent of problem in local population. So that early steps can be taken in screening and management of Type 2 diabetes patients to prevent them from developing dyslipidemia. This will help to get local evidence and we will be able to recommend that lipid profile of Type II diabetes patients should be screened on regular intervals to prevent the dyslipidemia as it worsen the quality of life of patients and may lead to cardiovascular and cerebrovascular complications.

OBJECTIVE

The objective of this study was to determine the frequency of dyslipidemia in Type 2 Diabetes mellitus patients presenting to a tertiary care hospital for routine check-up.

MATERIAL & METHODS

This was a Cross sectional, observation, descriptive study conducted at Unit 1, Department of Medicine, DHQ Hospital, Sahiwal from 5-5-2018 to 5-11-2018.

The sample size of 180 patients was calculated with 95% confidence level, 6% margin of error and taking expected percentage of dyslipidemia i.e. 17% in patients with Type II diabetes mellitus. Non-probability, consecutive sampling technique was used.

Patients of age 40-70years of either gender presenting with Type II diabetes mellitus (It was defined as BSR>186mg/dl for >1year and patient is taking anti-glycemic medication) for routine check-up diagnosed at least 1 year ago

were included in the study. Following patients were excluded from the study.

1. Patients with co-morbid conditions i.e. liver disease (ALT>40IU, AST>40IU), renal problems (Creatinine>1.2gm/dl), Anemia (Hb<10g/dl), Thyroid Problem (TSH>5IU/L)
2. Patients already taking statins (medical record)
3. Smokers (>5 pack year)
4. Morbidly obese (BMI>35kg/m²)

A total of 180 patients fulfilling selection criteria were enrolled in the study through OPD of Department of Medicine, DHQ Hospital, Sahiwal. Informed consent was obtained. Demographic information (name, age, gender, BMI, h/o hypertension [BP≥140/90mmHg], duration of diabetes) was also obtained. Then blood samples were obtained by using 3cc BD syringe with the help of a staff nurse. All samples were stored in sterile containers and sent to the Pathology Laboratory of the hospital for assessment of lipid profile. Reports were assessed and if cholesterol>200mg/dl and triglyceride>150mg/dl, then dyslipidemia was labeled. All this information was recorded on the pro-formas. The data collected was entered into SPSS version 21.0 and analyzed. Quantitative variables like age, BMI and duration of diabetes was calculated at Mean & Standard Deviation. Qualitative variable like gender, hypertension and dyslipidemia was calculated as frequency and percentage. Data was stratified for age, gender, BMI, hypertension (BP>160/90) and duration of diabetes.

RESULTS

The mean age of patients in this study was 52.87±7.54 years. Minimum and maximum age of patients was 40 and 65 years.

Among patients 88(48.9%) were male and 92(51.1%) were female.

As per BMI criteria 47(26.1%) patients were obese, 58(32.2%) were overweight and 75(41.7%) patient's BMI was normal.

Mean duration of diabetes was 18.17±3.84 months.

Among all patients 87(48.35%) were hypertensive.

The mean total cholesterol was 231.97 ± 118.63 mg/dl and mean triglycerides was 185.10 ± 85.06 mg/dl. Thus dyslipidemia was diagnosed in 81 (45%) patients.

Insignificant association was seen between age of patients and frequency of dyslipidemia i.e. p-value=0.440. Table-I.

Age	Dyslipidemia		Total
	Yes	No	
40-50	32(39.5%)	41(41.4%)	73
51-60	36(44.4%)	36(36.4%)	72
>65	13(16%)	22(22.2%)	35
Total	81	99	180

Table-I. Dyslipidemia among Type 2 Diabetic Patients stratified for age of patients
Chi-Square Test= 1.640 - p-value=0.440

Although among female patients frequency of dyslipidemia was higher as compared to male patients but it was not statistically significant i.e. Male: 43.2% & Female: 56.8%, p-value=0.168. Table-II

Gender	Dyslipidemia		Total
	Yes	No	
Male	35(43.2%)	53(53.5%)	88
Female	46(56.8%)	46(46.5%)	92
Total	81	99	180

Table-II. Dyslipidemia among Type 2 diabetic patients stratified for gender of patients
Chi-Square Test= 1.901 - p-value= 0.168

BMI index have no significant impact on frequency of dyslipidemia. However the highest frequency of dyslipidemia was seen in patients who were overweight. Table-III

BMI	Dyslipidemia		Total
	Yes	No	
Normal	27(33.3%)	48(48.5%)	75
Overweight	30(37%)	28(28.3%)	58
Obese	24(29.6%)	23(23.2%)	47
Total	81	99	180

Table-III. Dyslipidemia among Type 2 diabetic patients stratified for BMI of patients
Chi-Square Test= 4.212 - p-value= 0.122

Insignificant difference was seen for frequency of dyslipidemia among hypertensive and non-hypertensive patients. Table-IV

Hypertension	Dyslipidemia		Total
	Yes	No	
Yes	38(46.9%)	49(49.5%)	87
No	43(53.1%)	50(50.5%)	93
Total	81	99	180

Table-IV. Dyslipidemia among Type 2 status of patients
Chi-Square Test= 0.199 - p-value= 0.730

Insignificant difference was seen for frequency of dyslipidemia in relation to duration of diabetes i.e. p-value=0.650. Table-V

Duration of Diabetes	Dyslipidemia		Total
	Yes	No	
12-16	27(33.3%)	39(39.4%)	66
17-20	29(35.8%)	30(30.3%)	59
21-24	25(30.9%)	30(30.3%)	55
Total	81	99	180

Table-V. Dyslipidemia among Type-2 diabetic patients stratified for duration of diabetes
Chi-Square Test= 0.862 p-value= 0.650

DISCUSSION

Dyslipidemia as a metabolic abnormality has a strong association with DM. Its prevalence is variable due to dependence on the type and severity of DM, glycaemic control, nutritional status, age of the patients and other variables. Previous studies have shown a strong clustering risk factor for cardiac disease in diabetic patients.^{10,11} One or more types of dyslipidemia are present in about 70% of patients of DM Type-2 patients. In this study dyslipidemia was diagnosed in 81(45%) patients. Frequency of dyslipidemia was higher in age group 51-60 years (44.4%) as well as among female patients (56.8%). Overweight patients and patients with normal BMI had the highest frequency of dyslipidemia. In Nepal, the prevalence of dyslipidemia among Type II diabetes patients was 85.33%.⁵ In this study frequency of dyslipidemia was almost half as that of reported in study from Nepal. In Rawalpindi, the frequency of dyslipidemia was

80% among diabetic patients.⁶ In DG Khan, it was observed among diabetic patients dyslipidemia was found in 74% patients.⁷ Mehmood F et al., found in Multan that dyslipidemia is present in 81.5% diabetic patients.⁸

In this study, the frequency of dyslipidemia was much lower when it was compared with above mentioned local study. This difference may be due to difference in the study sample size or other methodological considerations. However the study conducted in Faisalabad found out the lower frequency of dyslipidemia as that of this study. i.e. 17% among diabetic patients.⁹

An observational study which was conducted among Chinese adults indicated that women had a higher dyslipidemia risk (Odds Ratio:1.51with 95% Confidence interval: 1.25–1.83).¹² The same trend was seen in this study that higher frequency of dyslipidemia was seen in diabetic female patients. Previous studies have reported higher provenance among men than in women which contradicts the findings of this study.^{13,14} Indian studies have also reported higher frequency of dyslipidemia in hyperglycemic patients (89-92.4%).^{15,16}

The inter-relationship of carbohydrates and lipids metabolism affects blood lipids in patients of diabetes. Therefore, any disorder in carbohydrate metabolism can make changes in lipid metabolism and vice versa.¹⁷ Insulin resistance is a primary defect in the majority patients with type-2 DM. In the case of non-diabetic patients, insulin resistance along with hyperinsulinemia has a high risk for future development of type-2 DM.¹⁸ Multiple studies have shown that insulin affects the liver production of apolipoprotein. It also regulates the enzymatic activity of lipoprotein lipase and cholesterol ester transport protein, which leads to dyslipidemia in DM. The activity of hepatic lipase is decreased due to the deficiency of insulin leading to inefficiency in the production of biologically-active lipoprotein lipase.^{19,20}

Dyslipidemia management in people with DM begins with a thorough assessment in order to identify secondary causes. As these causes lead

to the abnormality in the lipid profile.²¹ Lifestyle changes such as increased physical activity and dietary changes, is the mainstay of treatment. All efforts should be made to bring the blood glucose levels to normal in the poorly controlled patients of DM. The better control of blood glucose level will lead to improvement of the dyslipidemia.²²

CONCLUSION

The results of this study showed high frequency of dyslipidemia among type-2 diabetic patients. As Type-2 diabetes is very much common in our population, so there is a need to design screening programs in which blood lipid levels screening should be monitored on regular intervals to rule out dyslipidemia timely and for effective and proper management with statin therapy.




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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Khalil Ahmad	Supervision of data collection, Literature review.	
3	Rana Aamir Diwan	Authentication of references, Critical proof reading.	
4	M. Saiful Malook	Data analysis, Designing of charts/ tablers.	