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Research Article

**ASSESSMENT OF LIPID PROFILE IN CASES OF DIABETES
MELLITUS PRESENTING AT DHQ TEACHING HOSPITAL,
SAHIWAL****¹Dr. Khalil Ahmad, ²Dr. Mohsin Ali, ³Dr. Muhammad Shafiq Mughal**¹Associate professor of Medicine, Sahiwal Medical College, Sahiwal²Senior Registrar DHQ Teaching Hospital, Sahiwal³Consultant Family Medicine, Primary Health care Corporation, Al khor, Qatar**Abstract:****Objective:** To assess the lipid profile in cases of diabetes mellitus presenting at DHQ Teaching Hospital, Sahiwal.**Material and methods:** In this cross sectional study, total 198 patients of diabetes mellitus having age from 20-40 years either male or female from Department of Medicine DHQ Teaching Hospital, Sahiwal between March 2018 to September 2018 were selected. Dyslipidemia was assessed in selected patients.**Results:** In present study, mean age of the diabetics was 38.47 ± 12.73 years. Out of 198 type-II diabetics, dyslipidemia was found in 145 (73%) patients. Total 56 (69.14%) patients of age group 20-40 years and 89 (76.06%) patients of age group 41-60 years were found with dyslipidemia. Total 30 (43.48%) male patients and 115 (89.15%) female patients found with dyslipidemia. Association of dyslipidemia with gender was found to be significant ($P = 0.000$) statistically.**Conclusion:** Results of present study showed that most of the patients of diabetes mellitus was found with abnormal lipid profile. Advancing of age has no effect on the development of dyslipidemia. Most of the diabetics were females and significant association between gender and development of dyslipidemia was observed. Dyslipidemia was also associated with obesity and area of residence.**Key words:** Lipid profile, Type 2 diabetes mellitus, Dyslipidemia, CVD**Corresponding author:****Dr. Khalil Ahmad,**

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INTRODUCTION:

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia.¹ Depending on the etiology of the DM, factors contributing to hyperglycemia include reduced insulin secretion, decreased glucose utilization, and increased glucose production. The metabolic dysregulation associated with DM causes secondary pathophysiologic changes in multiple organ systems that impose a tremendous burden on the individual with diabetes and on the health care system. In the United States, DM is the leading cause of end-stage renal disease (ESRD), nontraumatic lower extremity amputations, and adult blindness. It also predisposes to cardiovascular diseases.² With an increasing incidence worldwide, DM will be a leading cause of morbidity and mortality for the foreseeable future.¹ Prevalence of diabetes in adults worldwide was estimated to be 4.0% in 1995 and is expected to rise to 5.4% by the year 2025. The number of adults with diabetes in the world will rise from 135 million in 1995 to 300 million in the year 2025. There will be a 42% increase, from 51 to 72 million, in the developed countries and a 170% increase, from 84 to 228 million, in the developing countries.^{2,3}

Research finding shows that it is the body composition components, mainly body fat and lipid profiles that are responsible for increase prevalence of this disease.⁴ The term “dyslipidemia” is increasingly popular to describe abnormal changes in lipid profile, replacing the old term “hyperlipidemia”. Dyslipidemia encompasses changes in High density lipoprotein cholesterol (HDL-C), the size and density of Low density lipoprotein cholesterol (LDL-C), very low density lipoprotein cholesterol (VLDL-C) and triglyceride level.⁵ The term diabetic dyslipidemia comprises a triad of raised triglycerides, reduced HDLC and excess of small, dense LDL particles.⁶ The lipid abnormalities are prevalent in diabetes mellitus because insulin resistance or deficiency affects key enzymes and pathways in lipid metabolism.⁷ In particular, the following processes are affected: apoprotein production, regulation of lipoprotein lipase, action of cholesteryl ester, transfer proteins and hepatic and peripheral actions of insulin.⁸ Even more, it has been proposed that the composition of lipid particles in diabetic dyslipidemia is more atherogenic than other types of dyslipidemia.⁹ This means that even normal lipid concentrations might be more atherogenic in diabetic than in nondiabetic people. The causal association between atherosclerosis and dyslipidemia is well established. In diabetes the associated hyperglycemia, obesity and insulin changes

highly accelerate the progression to atherosclerosis.¹⁰⁻¹³

The objective of this study is to find out the frequency of dyslipidemia in type-II diabetics. By early screening of type-II diabetics, we may be able to early manage the lipids and to decrease the morbidity and mortality related to it.

OPERATIONAL DEFINITION**Dyslipidemia:**

Presence of any one of following was labeled as dyslipidemia; When fasting lipid profile (after an overnight fast of 12 hours) is outside the range proposed by ATP (III)

Triglycerides	>150 mg/dl
HDL	<40 mg/dl
LDL	>100 mg/dl
Total Cholesterol	>200 mg/dl

Type-II Diabetes mellitus:

Type 2 diabetes mellitus was diagnosed as per criteria of American diabetics association:

Fasting plasma glucose level higher than 126 mg/dl or plasma Glucose level exceeding 200 mg/dl at 2 hours in the 75 g oral glucose tolerance test or symptoms of Diabetes and Random Plasma Glucose > 200mg/dl or HbA1C > 6.5%.

MATERIAL AND METHODS:

In this cross sectional study, total 198 patients of diabetes mellitus having age from 20-40 years either male or female from Department of Medicine DHQ Teaching Hospital, Sahiwal between March 2018 to September 2018 were selected. Known cases of type-1 DM, hypothyroidism, chronic renal failure, nephrotic syndrome, cholesteric jaundice, patients already on lipid lowering drugs, hypertensive using beta blockers or thiazide diuretics, having BMI more than 30 and patients using alcohol were excluded from the study. An approval was taken from ethical committee of the hospital and written informed consent was taken from every patient.

Total 5ml fasting blood sample was taken from every patients for total cholesterol, LDL, HDL & Triglycerides analysis. The entire test was run on fully automated chemistry analyzer selectra E and all levels were measured in mg/dl. Findings were noted on pre-designed performa in term of dyslipidemia (Yes/No). Demographic profile of all the patients was also noted on pre-designed performa.

All the collected data was entered in SPSS version 17 and analyzed. Mean and SD was calculated for

numerical data i.e. age. Categorical data was presented as frequency and percentage like gender, obesity, rural/urban and dyslipidemia. Stratification was done for age, BMI, gender, area of residence (rural/urban). Post stratification chi-square test was applied to see the effect of these on outcome variable i.e. dyslipidemia. P value ≤ 0.05 was considered as statistically significant.

RESULTS:

In present study, mean age of the diabetics was 38.47 ± 12.73 years. Out of 198 type-II diabetics, dyslipidemia was found in 145 (73%) patients. (Fig. 1) Age range was 20-60 years. Selected patients were divided into two age groups i.e. age group 20-40 years and age group 41-60 years. Total 81 (40.91) patients belonged to age group 20-40 years and 117 (59.09%) patients belonged to age group 41-60 years. Total 56 (69.14%) patients of age group 20-40 years and 89 (76.06%) patients of age group 41-60 years were found with dyslipidemia. After applying chi-square

test, insignificant association of development of dyslipidemia with age groups was noted with p value 0.3280. (Table 1)

Male diabetics were 69 (34.85%) followed by female diabetics were 129 (65.15%). Total 30 (43.48%) male patients and 115 (89.15%) female patients found with dyslipidemia. Association of dyslipidemia with gender was found to be significant ($P = 0.000$) statistically. (Table 2)

Out of 120 (60.61%) obese patients, dyslipidemia was noted in 94 (78.33%) patients. Total 78 (39.39%) patients were non-obese and dyslipidemia was seen in 51 (65.38%) patients. Significantly ($P = 0.050$) higher rate of dyslipidemia was noted in obese patients as compared to non-obese patients. (Table 3)

Total 58 (72%) patients belonged to rural area and 22 (80%) patients found with abnormal lipids. Total 140 (28%) patients were from urban area and dyslipidemia was noted in 123 (94.29%) patients. (Table 4)

Fig. 1
Frequency of dyslipidemia

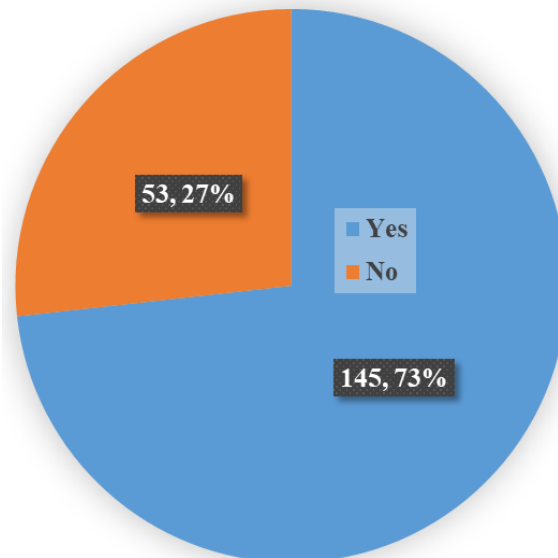


Table No.1: Association of dyslipidemia with age

Age Group	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
20-40	56 (69.14)	25 (30.86)	81 (40.91)	0.3280
41-60	89 (76.06)	28 (23.93)	117 (59.09)	
Total	145 (73)	53 (27)	198	

Table No.2: Association of dyslipidemia with gender

Gender	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
Male	30 (43.48)	39 (56.52)	69 (34.85)	0.000
Female	115 (89.15)	14 (10.85)	129 (65.15)	
Total	145 (73)	53 (27)	198	

Table No.3: Association of dyslipidemia with obesity

Obesity	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
Obese	94 (78.33)	26 (21.67)	120 (60.61)	0.050
Non-obese	51 (65.38)	27 (34.62)	78 (39.39)	
Total	145 (73)	53 (27)	198	

Table No.4: Association of dyslipidemia with area of residence

Area of residence	Dyslipidemia		Total (%)	P. value
	Yes (%)	No (%)		
Rural	22 (80)	36 (20)	58 (72)	0.000
Urban	123 (94.29)	17 (5.71)	140 (28)	
(Total)	145 (73)	53 (27)	198	

DISCUSSION:

Patients with diabetes mellitus have a 2 to 4 fold increased risk of cardiovascular, peripheral vascular and cerebrovascular disease, which are the leading causes of morbidity and mortality in this population.¹² Diabetes is considered a coronary heart disease (CHD) - risk equivalent and it is frequently associated with various other cardiovascular (CV) risk factors.¹³ It is well-established that dyslipidemia is a major risk factor for macrovascular complications in patients with type-2 diabetes mellitus and affects 10%-73% of this population. Approximately 80% of deaths in patients with diabetes are attributable to cardiovascular disease (CVD).¹⁴

The objective of present study was to evaluate the dyslipidemia in cases of type-II diabetes mellitus. Mean age of the diabetics was 38.47 ± 12.73 years. Dyslipidemia was found in 73% diabetics. In one study by Khan et al,¹⁵ dyslipidemia was found in 80% diabetics which is similar with our study. Ahmed et al did a comparative cross sectional study on 50 type 1 and 50 type 2 diabetics and found a high frequency of dyslipidemias in both groups. Some local studies have also reported that dyslipidemias are very common in diabetic population.¹⁶⁻¹⁸

International studies done show that among the diabetic dyslipidemias, hypertriglyceridemia is the commonest. Mathura et al found that the most

common lipid abnormality found in diabetics is increased serum triglyceride levels around 73.3%. The next common abnormality is decreased serum HDL-Cholesterol levels and increased serum LDL-Cholesterol levels, both seen in 66.7% patients respectively. A high total serum cholesterol level is seen in 46.7% patients.^{16,19} In one study conducted in Jordan by Abdel-Aal *et al*,²⁰ reported frequency of dyslipidemia was 91.5% patients with diabetics.

In another study, out of 189 patients, 123 were males and 66 females with age range of 35-80 years (Means 57.61 years \pm 10.25 SD). Over all frequency of dyslipidemia in newly-detected type-2 diabetics (T2DM) were observed in 71.4%.¹⁵ In present study Male diabetics were 153 (61.2%) and female diabetics were 97 (38.8%). Elevated lipids were seen in 129 (84.31%) male patients and in 81 (83.51%) female patients. No association was observed between gender and dyslipidemia with *p* value 0.8614.

In a study by Gilani *et al*,²¹ there were 80 (53.33%) male and 70 (46.7%) female patients. Mean BMI was 28.45 \pm 3.30 Kg/m². Mean serum cholesterol level was 3.9 \pm 1.31 mmol/L, triglyceride level was 2.98 \pm 1.14 mmol/L, LDL level was 3.28 \pm 0.85 mmol/L and HDL was 0.95 \pm 0.02 mmol/L. Women were more frequent to have low level HDL as compare to men (*p*<0.05), while no significant difference was found regarding serum cholesterol, serum triglyceride and serum LDL (*p*>0.05). In our study Mean age of the diabetics was 39.92 \pm 13.878 years, mean BMI was 26.8 \pm 5.48, mean HDL, LDL, TC and TG was 40.10 \pm 3.070 md/dl, 138.06 \pm 9.732 md/dl, 204.41 \pm 24.104 md/dl and 199.09 \pm 71.763 md/dl respectively. In one study by Sarfraz *et al*²² prevalence of dyslipidemia among diabetic males was 97.18% while for females 87.15%.

CONCLUSION:

Results of present study showed that most of the patients of diabetes mellitus was found with abnormal lipid profile. Advancing of age has no effect on the development of dyslipidemia. Most of the diabetics were females and significant association between gender and development of dyslipidemia was observed. Dyslipidemia was also associated with obesity and area of residence.

REFERENCES:

1. Niraula A, Thapa S, Kunwar S, Lamsal M, Baral N, Maskey R. Adenosine deaminase activity in type 2 diabetes mellitus: does it have any role?. *BMC endocrine disorders*. 2018 Dec;18(1):58.
2. Halder S, Roy K, Biswas K, Biswas P, Sarkar R. Study of relation of serum magnesium level with

glycemic control in diabetes mellitus. *Int J Res Med Sci* 2016;4:4429-33.

3. King H, Aubert RE, Herman WH. Global burden of diabetes, 1995–2025: prevalence, numerical estimates, and projections. *Diabetes care*. 1998 Sep 1;21(9):1414-31.
4. Dixit AK, Dey R, Suresh A, Chaudhuri S, Panda AK, Mitra A, Hazra J. The prevalence of dyslipidemia in patients with diabetes mellitus of ayurveda Hospital. *Journal of Diabetes & Metabolic Disorders*. 2014 Dec;13(1):58.
5. Taskinen MR. Diabetic dyslipidemia. *Atherosclerosis Supplements*. 2002 May 1;3(1):47-51.
6. Vergès B. Pathophysiology of diabetic dyslipidaemia: where are we?. *Diabetologia*. 2015 May 1;58(5):886-99.
7. Elnasri HA, Ahmed AM. Patterns of lipid changes among type 2 diabetes patients in Sudan.
8. Bardini G, Rotella CM, Giannini S. Dyslipidemia and diabetes: reciprocal impact of impaired lipid metabolism and Beta-cell dysfunction on micro- and macrovascular complications. The review of diabetic studies: RDS. 2012;9(2-3):82.
9. Regmi P, Gyawali P, Shrestha R, Sigdel M, Mehta KD, Majhi S. Pattern of Dyslipidemia in Type-2 Diabetic Subjects in Eastern Nepal. *J Nepal Assoc Med Lab Sci*. 2009;10:11–13.
10. Wexler DJ, Grant RW, Meigs JB, Nathan DM, Cagliero E. Sex disparities in treatment of cardiac risk factors in patients with type 2 diabetes. *Diabetes care*. 2005 Mar 1;28(3):514-20.
11. Martín-Timón I, Sevillano-Collantes C, Segura-Galindo A, del Cañizo-Gómez FJ. Type 2 diabetes and cardiovascular disease: have all risk factors the same strength?. *World journal of diabetes*. 2014 Aug 15;5(4):444.
12. Bertoluci MC, Rocha VZ. Cardiovascular risk assessment in patients with diabetes. *Diabetology & metabolic syndrome*. 2017 Apr 20;9:25–25.
13. : Mandal M, Kumari R, Mukherjee A. Prevalence of dyslipidemia in patients with type 2 diabetes mellitus : a hospital based study in Kishanganj, India. *Int J Res Med Sci* 2015;3: 3691-7.
14. Saydah SH, Fradkin J, Cowie CC. Poor control of risk factors for vascular disease among adults with previously diagnosed diabetes. *JAMA*. 2004;291:335-42.
15. Khan AR, Muhammad T, Razaq A. PREVALENCE OF DYSLIPIDEMIA IN NEWLY DIAGNOSED TYPE 2 DIABETES PATIENTS AT DIAGNOSED AT KGNTH BANNU. *Gomal Journal of Medical Sciences*. 2017 Dec 31;15(4).

16. Ahmed S, Ali QM, Ashraf T, Gulzar MM. Frequency of Dyslipidemia in normotensive diabetics. *Pak J Cardiol* Apr 2005;16:14-22.
17. Haq A, Rehman J, Mahmood R, Safi AJ, Ahmed Z, Arif S. Pattern of lipid profile in type-2 diabetes mellitus patients. *J Postgrad Med Inst* Dec 2006;20:366-9.
18. Firdous S, Khan MZ. Comparison of patterns of lipid profile in type-2 diabetics and non-diabetics. *Ann King Edward Med Coll* Mar 2007;13:84-7.
19. Mathura KC, Vaidya B, Gurbacharya DL. Study of serum lipid profile in type 2 diabetic patients attending KMCTH. *Nepal Med Coll J* 2005 ;7:97-100.
20. Abdel-Aal NM, Ahmad AT, Froelicher ES, Batiha M, Hamza MM, Ajlouni KM. Prevalence of dyslipidemia in patients with type 2 diabetes in Jordan. *Saudi medical journal*. 2008;29(10):1423-8.
21. Gilani SY, Bibi S, Ahmed N, Shah SR. Gender differences of dyslipidemia in type 2 diabetics. *Journal of Ayub Medical College Abbottabad*. 2010 Sep 1;22(3):146-8.
22. Sarfraz M, Sajid S, Ashraf MA. Prevalence and pattern of dyslipidemia in hyperglycemic patients and its associated factors among Pakistani population. *Saudi journal of biological sciences*. 2016 Nov 1;23(6):761-6.