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Research Article

### FREQUENCY OF DYSLIPIDAEMIA IN TYPE 2 DIABETICS

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**Abstract:**

*Diabetes Mellitus is a chronic health disorder that occurs when the pancreas does not produce sufficient amount of insulin, or when the body cannot effectively use the insulin it produces. This eventually leads to the raised concentration of glucose in the blood known as hyperglycemia. The present study was conducted to determine the frequency of dyslipidaemia in patients with type 2 diabetes mellitus. The study was carried out in the Department of Medicine of Ayub Teaching Hospital Abbottabad from April 2016 to October 2016.*

***Methods:** Patients were confirmed as diabetics by taking the history carefully of type-II diabetes for the last four years at least and were on oral anti diabetics or insulin but not taking the lipid lowering agents. Height and weight of all the patients were measured and BMI for every patient was calculated. Blood was taken in the fasting state for lipid profile, fasting blood glucose and glycosylated haemoglobin determination.*

***Results:** Out of total 196 In frequency distribution with HDL cholesterol group, there were 20(10.2%) male dyslipidemics patients found and 20(10.2%) female dyslipidemics patients, LDL cholesterol group, there were 64(32.7%) male dyslipidemics patients found and 52(26.5%) female dyslipidemics patients, triglycerides group, there were 52(26.5%) male dyslipidemics patients found and 28(14.3%) female dyslipidemics patients and total cholesterol group, there were 56(28.6%) male dyslipidemics patients found and 36(18.4%) female dyslipidemics patients.*

***Conclusion:** Present study showed the same as in many previous studies concluded that common lipid abnormalities during diabetes induced dyslipidemia. Aggressive lifestyle changes, such as weight reduction and physical exercise should be initiated first followed by medication with lipid lowering drugs*

***Keywords:** Dyslipidaemia, Glycosylated haemoglobin, Type 2 Diabetes mellitus.*

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## INTRODUCTION:

Diabetes Mellitus is a chronic health disorder that occurs when the pancreas does not produce sufficient amount of insulin, or when the body cannot effectively use the insulin it produces<sup>1</sup>. This eventually leads to the raised concentration of glucose in the blood known as hyperglycemia. Diabetes mellitus is classified as type 1 or insulin dependent diabetes, type 2 or non insulin dependent diabetes and gestational diabetes<sup>2</sup>. Type 2 diabetes, the most common form of diabetes is caused by the body's ineffective use of insulin. It generally results from excess body weight and physical inactivity<sup>3</sup>. Different patterns of dyslipidaemia are found to be associated with type 2 Diabetes mellitus. Type 2 diabetic patients have moderate hypertryglyceridemia, slightly increased low-density lipoprotein (LDL), and LDL particles and they are found to have low levels of high density lipoproteins (HDL)<sup>4</sup>. Hypertryglyceridemia is an independent risk factor for coronary artery disease<sup>5</sup>. Dyslipidemia occurs due to metabolic derangements and in type 2 diabetes it results because of insulin resistance leading to the defects in lipid handling. Relative insulin deficiency, insulin resistance and obesity are found to be associated with hypertryglyceridemia, low serum HDL cholesterol and occasionally high serum LDL cholesterol and lipoprotein values<sup>6</sup>. Type 2 diabetics also have increased amounts of intermediate lipid particles, including very low-density lipoprotein (VLDL) and intermediate density lipoprotein (IDL)<sup>7</sup>. This can lead to an increased non-HDL cholesterol level which is associated with an even higher risk of CVD than increased LDL levels in type 2 diabetics<sup>8</sup>. Currently, 70% to 80% of diabetics die of CVD; therefore, cardiovascular risk reduction should be a central part of diabetic management<sup>9</sup>. Diabetes mellitus is a common secondary cause of hyperlipidaemia, particularly, if glycaemic control is poor<sup>10-13</sup>, which in-turn is an important risk factor for atherosclerosis and coronary heart disease. The study was conducted to determine the frequency of dyslipidaemia in patients with type 2 diabetes mellitus with that of good glycaemic control.

## MATERIAL AND METHODS:

### Study Setting:

The study was conducted in the department of Medicine, Ayub Teaching Hospital; Abbottabad. It is situated on the Silk Road and is a tertiary care hospital with three established general medical units with more than 150 beds. Data was collected after approval from hospital ethical and research committee. Those patients fulfilling the inclusion criteria were selected from Medical ward/OPD of Ayub Teaching Hospital. Patients were briefed about

the aims and benefits of the study and a written informed consent was taken. Data was collected by using the predesigned proforma. Patients were confirmed as diabetics by taking the history carefully of type-II diabetes for the last four years at least and were on oral anti diabetics or insulin but not taking the lipid lowering agents. Fasting blood samples were drawn from the patients under strict aseptic technique and sent to the hospital laboratory on the same day. Fasting blood sugar and lipid profile of all the patients included in the study was measured under the supervision of Pathologist who is the fellow of CPSP and had more than 10 years working experience in Pathology. Height and weight of all the patients were measured and BMI for every patient was calculated. All the patients were asked about the family history of hypertension and blood pressure of every patient was measured. All the study procedure and data collection were performed by the trainee himself to limit the selection bias.

### Data Analysis Procedure:

All the data was entered and analyzed by using SPSS software ver. 16.00. Frequencies and percentages were calculated for categorical variables like gender, presence of dyslipidemia and presence of hypertension. Mean±SD was calculated for continuous variables like age and BMI. All the results were presented as tables and graphs. Data was stratified by age, gender with respect to the presence of dyslipidemia. To know the difference by age and gender by outcome variable i.e. dyslipidemia, chi-square test was used at 5% level of significance.

### Ethical Consideration:

This study was certified by the Ethics Committee of the Department of Medicine of Ayub Teaching Hospital Abbottabad. All patients signed the informed consent in this research and it was conducted as per Helsinki's declaration for human volunteers. The reference No is 241/DMT2/ATHA

### RESULTS:

In this study 196 patient of dyslipidemia with type 2 diabetes mellitus were enrolled having age 40 to 70 years, the mean age of the patients was 61.21+ 7.307 years, mean duration of diabetes mellitus was 14.10±8.208 ranging from 5 to 36 years, mean total cholesterol was 194.49±29.496 ranging from 140 to 280 mg/dl, mean triglycerides was 144.08±17.994 ranging from 110 to 90 mg/dl, mean LDL cholesterol was 102.8571±14.32230 ranging from 80 to 160 mg/dl, mean HDL cholesterol was 55.3061±11.11286 ranging from 30 to 70 mg/dl out of total 196 patients as shown in table 1.

**Table 1: Descriptive Statistics (n=196)**

	Min	Max	Mean	Std. Deviation
Age (years)	40	70	61.21	7.307
Duration of Diabetes Mellitus	5	36	14.10	8.208
Height (meter)	1.22	1.83	1.5134	.14850
Weight (kg):	45	90	65.82	11.326
BMI	19	49	29.02	5.083
Fasting Lipid Profile (Total Cholesterol)	140	280	194.49	29.496
Fasting Lipid Profile (Triglycerides)	110	190	144.08	17.994
Fasting Lipid Profile (LDL-Cholesterol)	80.00	160.00	102.8571	14.32230
Fasting Lipid Profile (HDL-Cholesterol)	30.00	70.00	55.3061	11.11286
Blood Pressure(Systolic) (mmHg):	100.00	190.00	143.0612	26.71437
Blood Pressure (Diastolic)(mmHg):	60.00	100.00	82.2449	7.30727

**Frequency distribution of Gender with HDL group:**

In frequency distribution of gender with HDL cholesterol group, there were 20(10.2%) male

dyslipidemics patients found and 20(10.2%) female dyslipidemics patients out of total 196 patients as shown in table 2.

**Table 2: Frequency distribution of Gender with HDL group**

	HDL group		Total	
	Dyslipidemics	Normal		
Gender	Male	20 10.2%	92 46.9%	112 57.1%
	Female	20 10.2%	64 32.7%	84 42.9%
Total		40 20.4%	156 79.6%	196 100.0%

**Frequency distribution of Gender with LDL group:**

In frequency distribution of gender with LDL cholesterol group, there were 64(32.7%) male

dyslipidemics patients found and 52(26.5%) female dyslipidemics patients out of total 196 patients as shown in table 3.

**Table 3: Frequency distribution of Gender with LDL group**

	LDL group		Total	
	Normal	dyslipidemics		
Gender	Male	48 24.5%	64 32.7%	112 57.1%
	Female	32 16.3%	52 26.5%	84 42.9%
Total		80 40.8%	116 59.2%	196 100.0%

**Frequency distribution of Gender with Triglycerides group:**

In frequency distribution of gender with triglycerides group, there were 52(26.5%) male dyslipidemics

patients found and 28(14.3%) female dyslipidemics patients out of total 196 patients as shown in table 4.

**Table 4: Frequency distribution of Gender with Triglycerides group**

	Triglycerides group		Total
	Normal	Dyslipidemics	
Gender	Male	52	112
		30.6%	57.1%
Gender	Female	28	84
		28.6%	42.9%
Total		80	196
		59.2%	100.0%

**Frequency distribution of Gender with Total Cholesterol group:**

In frequency distribution of gender with total cholesterol group, there were 56(28.6%) male

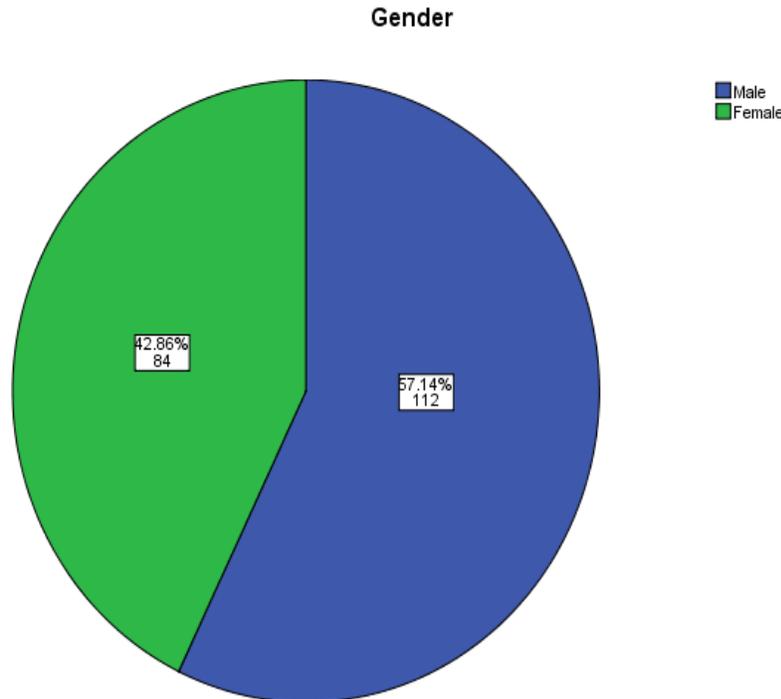
dyslipidemics patients found and 36(18.4%) female dyslipidemics patients out of total 196 patients as shown in table 5.

**Table 5: Frequency distribution of Gender with Total Cholesterol group**

	Total Cholesterol group		Total
	Normal	Dyslipidemics	
Gender	Male	56	112
		28.6%	57.1%
Gender	Female	36	84
		24.5%	42.9%
Total		92	196
		53.1%	100.0%

**Frequency of gender of patients:**

In frequency of gender, there were 84(42.86%) female while 112(57.14%) were male patients, out of total 196 patients as shown in figure 1.



**Figure 1: Frequency of gender of patients (n=196)**

#### DISCUSSION:

In this study 196 patient of dyslipidemia with type 2 diabetes mellitus were enrolled having age 40 to 70 years, the mean age for the patients was  $61.21 \pm 7.307$  years, mean systolic blood pressure was  $143.0612 \pm 26.71437$  ranging from 100 to 190 mmHg and diastolic blood pressure was  $82.2449 \pm 7.30727$  ranging from 60 to 100 mmHg. In the Iranian population, low HDL cholesterol was the most common metabolic abnormality in both sexes<sup>14</sup> In western India, the prevalence of low HDL cholesterol was 90.2% in women and 54.9% in men<sup>15</sup> In our study the frequency distribution of gender with HDL cholesterol group, there were 20(10.2%) male dyslipidemics patients found and 20(10.2%) female dyslipidemics patients.

In our study the frequency distribution of gender with LDL cholesterol group, there were 64(32.7%) male dyslipidemics patients found and 52(26.5%) female dyslipidemics patients. In this study the frequency distribution of gender with triglycerides group, there were 52(26.5%) male dyslipidemics patients found and 28(14.3%) female dyslipidemics patients. In this study the frequency distribution of gender with total cholesterol group, there were 56(28.6%) male dyslipidemics patients found and 36(18.4%) female dyslipidemics patients. In our study the frequency of

triglycerides, patients found normal were 116(59.18%) while 80(40.82%) were found with dyslipidemia. In frequency of LDL cholesterol, patients found normal were 80(40.82%) while 116(59.18%) were found with dyslipidemia In frequency of HDL cholesterol, patients found normal were 40(20.41%) while 156(79.59%) were found with dyslipidemia. In frequency of gender, there were 84(42.86%) female while 112(57.14%) were male patients, In frequency of family history of diabetes, patients found with diabetic history 156(79.59) and 40(20.41%) were found with no diabetic history. Obesity plays a central role in causing Metabolic Syndrome, so the fundamental approach to this syndrome is weight reduction and increased physical activity<sup>16-17</sup>. However, drug treatment could be appropriate for diabetes [18].

Pharmacological therapy consists of metformin, statins, fibrates, angiotensin converting enzyme inhibitors, and thiazolidinediones, all of which can decrease the risk and incidence of cardiovascular diseases. Sibutramine is also useful for weight reduction on a short-term basis [19-20].

#### CONCLUSION:

Present study showed the same as in many previous studies concluded that common lipid abnormalities

during diabetes induced dyslipidemia. Results suggest a high prevalence of dyslipidemia, which might be playing a major role in the development of cardiovascular diseases among diabetic patients. The optimal care of diabetic patients should include routine monitoring of blood sugar and serum lipid profile. Aggressive lifestyle changes, such as weight reduction and physical exercise should be initiated first followed by medication with lipid lowering drugs.

#### Declaration of Conflicting Interests:

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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