

## A STUDY OF LIPID PROFILES IN PATIENTS OF TYPE 2 DIABETES MELLITUS

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### ABSTRACT

#### BACKGROUND

The pattern of dyslipidaemia varies among the patients of type 2 diabetes mellitus. The purpose of the present study is to find lipid abnormalities in type 2 Diabetes Mellitus patients, which is the important factor causing atherosclerosis and cardiovascular diseases.

#### MATERIALS AND METHODS

This cross-sectional comparative study was conducted in 100 patients attending the OPD of Department of Medicine at Jhalawar Medical College Hospital, Jhalawar (Rajasthan) from July 2015 to Dec 2015. Random sampling (Allocation) method was used and data assessed in a prospective manner. Fasting Blood Sugar, Postprandial Blood Sugar (FBS, PPBS), Lipid profile, Triglyceride (TG), Low-Density Lipoprotein (LDL), High-Density Lipoprotein (HDL), Total Cholesterol (TC), were measured. Statistical analysis were performed.

#### RESULTS

A total number of 100 patients type 2 Diabetes Mellitus (52 males and 48 females) attending OPD were recruited in this study. TG levels were (195.92±5.42 and 184.31±7.86) in male and female respectively with significant difference between the genders (P<0.0001). Total cholesterol in male and female (164.25±3.15 and 183.45±4.22), respectively. Low-Density Lipoprotein (LDL) in male and female was (98.66±2.36 and 113.68±2.56), respectively. High-Density Lipoprotein was in male and female (38.28±4.7) and (39.35±2.57), respectively.

#### CONCLUSION

In conclusion, dyslipidaemia were observed in a greater proportion in both genders more in female type 2 diabetes mellitus patients than male type 2 diabetes mellitus patients.

#### KEYWORDS

Dyslipidaemia; Triglyceride (TG), Cardiovascular Diseases, Atherosclerosis.

**HOW TO CITE THIS ARTICLE:** Gupta RP, Meena M, Jain SC, et al. A study of lipid profiles in patients of type 2 diabetes mellitus. J. Evid. Based Med. Healthc. 2016; 3(82), 4437-4439. DOI: 10.18410/jebmh/2016/944

#### BACKGROUND

Diabetes Mellitus is responsible for development of cardiovascular diseases.<sup>[1],[2]</sup> Diabetic individuals have impaired utilisation of lipids and lipoproteins, which can cause atherogenic dyslipidaemia, which in turn is a major risk factor in the development of atherosclerosis.<sup>[3],[4],[5]</sup> Progression of atherosclerosis is aided by certain modifiable and non-modifiable risk factors. Examples of non-modifiable risk factors are age, gender and genetics, while obesity, smoking, hypertension, diabetes, dyslipidaemia are examples of modifiable risk factors.<sup>[6],[7]</sup> Increased levels of Low-Density Lipoprotein (LDL), Triglycerides (TG) and decreased levels of High-Density Lipoprotein (HDL) in the serum are indicators of diabetic dyslipidaemia.<sup>[8]</sup>

*Financial or Other, Competing Interest: None.*

*Submission 21-09-2016, Peer Review 05-10-2016,*

*Acceptance 10-10-2016, Published 12-10-2016.*

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*DOI: 10.18410/jebmh/2016/944*

Higher disposition to dyslipidaemia increases the chance of mortality and morbidity in diabetic individuals.<sup>[9],[10]</sup> There are a variety of factors that contribute to the prevalence of dyslipidaemia, including geographic location, social and economic status, age, gender and the impact of these factors has been well studied.<sup>[11],[12],[13],[14],[15]</sup> Cholesterol and lipoproteins levels increase with age in both genders,<sup>[16],[17]</sup> but the more pronounced increase has been reported in females than in males.<sup>[9]</sup> The purpose of the study is to find the lipid abnormalities in type 2 Diabetes Mellitus patients

#### MATERIALS AND METHODS

This cross-sectional comparative study was conducted in 100 patients in the OPD of Department of Medicine at Jhalawar Medical College Hospital, Jhalawar (Rajasthan) from July 2015 to Dec 2015. Random sampling (Allocation) method was used and data assessed in a prospective manner. Patients from OPD were analysed in this study with the informed consent and on the basis of inclusion and exclusion criteria. Patients on statins or fibrates were excluded.



Blood was drawn using standard venepuncture techniques and serum was separated from blood cells as soon as possible. System inventory of matrix cells and bulk solutions were confirmed prior to ordering tests. Following report can be referenced for sample placement information and sample cup volume requirements for all ordered tests.

Blood samples were collected after 12-14 hours of fasting and were analysed for serum triglycerides, total cholesterol, HDL-C, LDL-C, VLDL-C.<sup>[18]</sup>

Fasting Blood Sugar and Postprandial Blood Sugar (FBS, PPBS) were measured by enzymatic method in colorimeter.<sup>[19]</sup> The values used to define low-, borderline-, and high-risk LDL cholesterol were 130 mg/dL, respectively. For triglycerides, the cutoff points was 400 mg/dL. For total cholesterol low, borderline, high were 200 mg/dL, respectively. HDL risk category levels were defined separately for men and women according to the guidelines provided by the American Diabetic Association. This is 45 mg/dL for men and 55 mg/dL for women. Statistical analyses was performed.

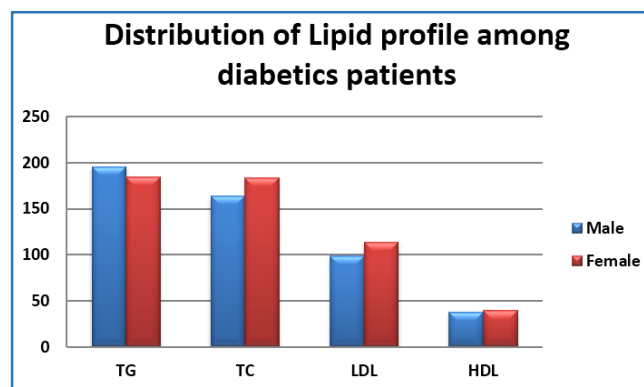
**RESULTS**

A total number of 100 patients of type 2 Diabetes Mellitus (52 males and 48 females) attending to OPD were recruited

in this study. In this study, Triglyceride (TG) level was higher in both genders, but level was more in male than female (195.92±5.42 and 184.31±7.86, respectively P <0.0001). Total Cholesterol (TC) in male and female (164.25±3.15 and 183.45±4.22 P<0.0001\*, respectively), Low-Density Lipoprotein (LDL) in male and female (98.66±2.36 and 113.68±2.56 P<0.0001\*, respectively, (TC and LDL) was within normal physiological level in both groups, whereas these levels were higher in female in comparison to male. High-Density Lipoprotein (HDL) in male and female (38.28±4.7 and 39.35±2.57 P=0.1659, respectively) was below normal level in both genders. However, it was slightly higher in female than male and the difference was insignificant (P=0.1659) in this study. Total cholesterol and LDL level was within normal physiological level in both genders, whereas these levels were higher in female as compared to male (TC=183.45±4.22 and 164.25±3.15 and LDL=113.68±2.56 and 98.66±2.36, respectively) (P <0.0001) showing significant difference between the genders. HDL was below normal in both male (38.28±4.7) and female (39.35±2.57); however, HDL was slightly higher in female than male and the difference was insignificant (p=0.1659).

Parameter	Male (n=52) Mean±SD	Female (n=48) Mean±SD	T value	P value
TG	195.92±5.42	184.31±7.86	8.6547	<0.0001*
TC	164.25±3.15	183.45±4.22	25.9114	<0.0001*
LDL	98.66±2.36	113.68±2.56	30.5295	<0.0001*
HDL	38.28±4.7	39.35±2.57	1.3960	0.1659

**Table 1: Distribution of Lipid Profile Among Diabetic Patients**



**Graph 1**

**CONCLUSION**

Most of our patients had a combination of Low-Density Lipoprotein Cholesterol (LDL-C); High-Density Lipoprotein Cholesterol (HDL-C) cholesterol level and high triglyceride is the most common pattern of dyslipidaemia found in female diabetics in this study and the second most common pattern of dyslipidaemia is found as increased triglyceride, decreased high-density lipoprotein (HDL), cholesterol. Overall, a greater proportion of women are found dyslipidaemic as compared to men.

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