

Frequency and Pattern of Dyslipidemia in Libyan Type 2 Diabetic Patients

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Abstract:

Objectives: *To determine frequency and pattern of diabetic dyslipidemia in Libyan Type2 diabetes Melleitus (T2DM) patients.*

Methods: *This was non-interventional cross section study took place at Ghadames Central Hospital between January and February 2016. Forty T2 DM patients were tested for lipids levels (LDL-C, HDL-C, and TG) in addition to fasting blood sugar (FBS) and glycolated hemoglobin (HbA1c).*

Results: *Study results showed that 76% of participants had at least one dyslipidemic feature. Low HDL-C was the most common type (26%).*

The mean HDL-C in the males was 49mg/dl (SD +- 40) whereas in the females it was 46mg/dl (SD+-25). High LDL-C was found in 47% of subjects and the mean LDL-C was 96mg/dl (SD+- 47mg/dl). Raised TG found in 12.5% of the participants and the mean TG was 99mg/dl (SD 57mg/dl). Abnormal FBS was found in 35% and abnormal HbA1c was found in 81% of subjects.

Over 76% of patients with T2DM have one or more type of dyslipidemia. Most of Libyan diabetic patients give attention to their glycemic level and ignore other risk factors such as dyslipidemia, smoking and hypertension.

Key words: *Frequency, Diabetes, Dyslipidemia, HDL, Libya*

1.Introduction:

In 2010, the estimated overall prevalence of diabetes mellitus among adults in Libya was 9% in population aged 20-79 and it anticipated to increase to 10.3% by 2030¹. Many studies have proven that diabetes is a coronary heart disease (CHD) risk equivalent and patients with diabetes have 2 to 4 fold risk of coronary artery disease. Indeed, cardiovascular diseases are responsible of around 80% of diabetic associated mortalities^{2,3}.

Diabetic dyslipidemia, which defined as high low-density lipoprotein cholesterol (LDL-C or bad cholesterol), or Low High density lipoprotein (HDL-C or good cholesterol) or high triglycerides (TG) accelerate atherosclerosis as well as macro and micro vascular complications of diabetes. Diabetic dyslipidemia affect between 10 to 73% of diabetic patients^{3,4}

American Diabetic Association (ADA), national cholesterol education program, and all other international diabetic management guidelines advocate aggressive treatment of lipids in diabetic population. American Diabetes Association (ADA) encourages that all diabetic patients should have lipid goals as illustrated in table 1

Table 1:- Lipid goals as per ADA guidelines for diabetic patients:

Lipid parameter	Goal
LDL-C	Less than 70mg/dl in patients with overt CVD Less than 100mg/dl in patients without overt CVD
HDL-C	More than 40 mg/dl for males and More than 50 mg/dl for females
Total Cholesterol	Less than 150mg/dl
Triglycerides	Less than 240mg/dl

Currently, there is no enough studies about, pattern, and frequency of diabetic dyslipidemia in Libyan patients with diabetes. The rationale of this study was find out frequency and pattern of diabetic dyslipidemias among sample of type two Libyan diabetic patients.

Materials and Methods:

This study was carried out at Ghadames central hospital and it was non-interventional, cross-sectional study. Ghaadmes is an oasis city located about 500km to the south west of Libyan capital Tripoli. Study's participants recruited by announcing the purpose of the study.

Forty patients agreed to participate. An informed consent was obtained from every patients after full explanation of the procedure. Every patients was advised to be fasting overnight at least for 12 hrs. in the next morning, basic information were obtained from each patient and then 5 ml of venous blood were collected for measuring Fasting Blood Sugar (FBS), Glycolated Hemoglobin (HbA1c), and lipid profile (LDL-C, HDL-C, and TG).

Study variables was defined based on 2004 ADA criteria of abnormal lipid levels. HDL-C was considered low when the level is <40mg/dl in males, and <50mg/dl in females. LDL-C was considered high when the level is > 100mg/dl. Hypertriglycedimia (TG) defined as TG level >150 mg/dl. Statistical Package for Social Sciences (SPSS, version 15.0) was used for data analysis. The values of all the parameters were given in mg/dl and results were described in terms of mean \pm standard deviation (SD) and percentage.

Results:

Out of the total forty (40) study participants, sixty seven percent (67%) were females, and 33% were males. The mean age of the study population was 58 years (SD+-12) and the mean duration of diabetes was 9years. Study results showed that 35% of study subjects had FBS more than that recommended for diabetic patients (130mg/dl). The mean FBS was 130mg/dl (SD +- 49 mg/dl). The mean glycolyated hemoglobin was 8% (SD+- 1.3%) and 82% of participants had HbA1c more than targeted level (7%).

Lipid profile analysis showed 76% of subjects had at the least one of dyslipidemic features. Forty-seven percent (47%)of study population had

LDL-C level higher than recommended for diabetic patients. The mean LDL-C was 96mg/dl (SD 47mg/dl). Raised TG found in 12.5% of the participants and the mean TG was 99mg/dl (SD 57mg/dl). Low HDL-C found in 78% of males and 63% of females respectively. The mean HDL-C in the males was 49mg/dl (SD +/- 40) whereas in the females it was 46mg/dl (SD +/- 25)

Table 2:- Normal range, study group range, and Mean (SD) of FBS, HBA1c, and Lipids levels:

Variable	Normal Range Mg/dl	Study group range	Mean+-SD
Glucose (FBS)	70-100	54-258	130+-49
HBA1c	<6.5	6.2-11.7	8+-1.3
LDL	<100	10-186	95.7+-47
HDL			
Males	>50	25-165	49+-40
Females	>45	5-104	46+-25
TG	<150	24-352	98.7+-57

Regarding pattern of dyslipidemia, As shown in the figure (1) the most common pattern of dyslipidemia among Libyan diabetic patients was isolated single parameter low HDL-C (26%) followed by isolated high LDL-C and combined high LDL-C and low HDL-C (19% for both).

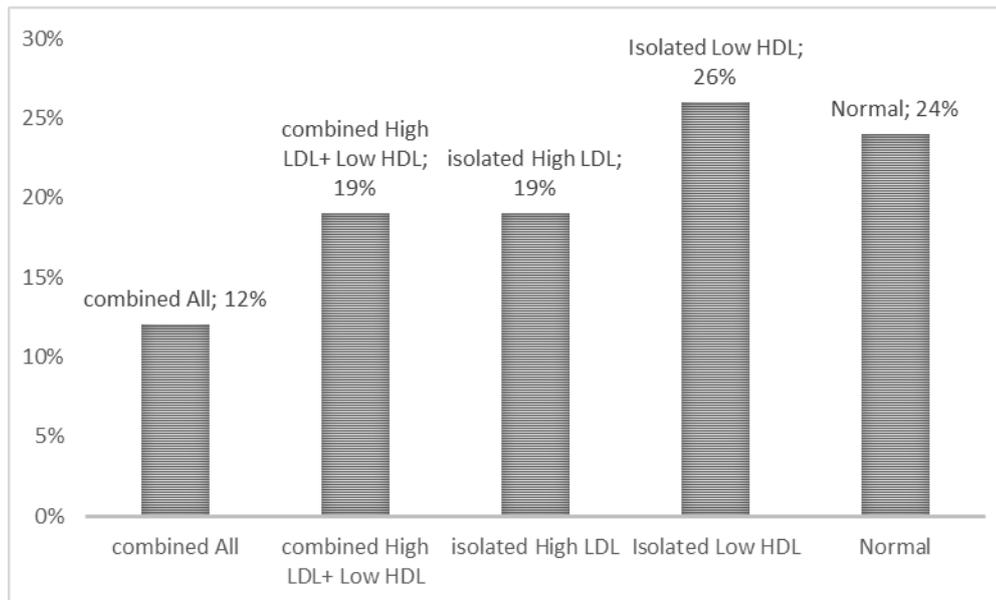


Figure 1:-pattern of dyslipidemia in study sample

Discussion:

Our study results reveal inadequate control of lipids in Libyan T2DM patients. Only 24% of subjects had lipid levels within targeted goals. Low HDL-C was the commonest dyslipidemic feature among participants (78% of males, and 63% of the females). High LDL-C was found in 47% of patients and 12.5% of the subjects had raised TG.

Lipid abnormalities are common in type-2 diabetics and Centers of diseases Control (CDC) estimated that 97 percentage of adults with diabetes have one or more lipid abnormalities². Study outcomes are similar to study done in Benghazi, Libya by Alshkri, and Elmehdewi⁴. In addition, to study in Nigeria by Okafor and eatal⁵. But, different from studies conducted in Jordan, Kuwait, and Pakistan^{2 6 7}.

Abnormal high frequency of lipid abnormalities in Libyan diabetic patients might result from several factors such as bad glycemic control

(High HbA1c), obesity, no prescription of lipid lowering drugs, and other factors.

This study encountered some limitations; first, it carried out at one sitting and need replication with increased numbers of participants. In addition, study subjects were not tested for other risk factors of CHD such as smoking, hypertension, and history of CHD. Finally, more sophisticated laboratory tests are required to examine for small particles LDL-C and apo proteinA, which are the atherogenic particles, associated with athrosclerosis.

Conclusion:

Over 76% of patients with T2DM have one or more type of dyslipidemia. Most of Libyan diabetic patients give attention to their glycemic level and ignore other risk factors such as dyslipidemia, smoking and hypertension

Acknowledgements:

The author expresses his thanks to 4th year Medical laboratory students 1-Enass Heba 2- Eman Alansari 3- Nauall Abo zmallaa 4-Salsabeel Abdo almajeed ce Who helped in conducting this study at Ghadames Hospital.

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