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Clinical of Dyslipidemia in Type 2 Diabetes Mellitus Patients in Murjan hospital , Iraq

Msc.Noor A. Hussein
Clinical Pathology- Al-Mustaqbal Collage University, Hilla, IRAQ
Email: real_iraq74@yahoo.com

ABSTRACT

This descriptive analytical study conducted on fifty one adult patients of type 2 diabetes mellitus in Murjan general teaching hospital in Babylon province. The study was conducted from February to August / 2014. Data was collected on special proforma. Patients of diabetes mellitus type 2 had mean age of 51.55 ± 8.8 yrs, range 35-70 years . Further analysis of results showed that raised cholesterol was detected in %39.2 (n=20) patients. Triglyceride was increased in 58.8% (n=30) patients. The HDL was decreased in 39.2% (n=20) patients, while LDL was raised in 35.2 % (n=18) patients ,VLDL was raised in 60.7 % (n= 31) patients.

Key Words :Diabetes mellitus , dyslipidemia, Lipid profile,HBA1c,Microalbuminurea,Iraq.

1 INTRODUCTION

Diabetes mellitus type 2 is a metabolic disorder that is characterized by hyperglycemia (high blood sugar) in the context of insulin resistance and relative lack of insulin. The chronic hyperglycemia of diabetes is associated with long-term damage, failure of various organs, especially the eyes, kidneys, nerves, heart and blood vessels[1].

Patients with type-2 diabetes have increased risk of cardiovascular disease associated with atherogenic, dyslipidaemia, Coronary artery disease, especially myocardial infarction is the leading cause of morbidity and mortality worldwide [2]. Hyperglycaemia and atherosclerosis are related in type-2 diabetes [3].

Dyslipidemia is elevation of plasma cholesterol, triglycerides (TGs), or both, or a low high-density lipoprotein level that contributes to the development of atherosclerosis of which causes may be primary (genetic) or secondary and diagnosed by measuring plasma levels of total cholesterol, TGs, and individual lipoproteins. It is traditionally classified by patterns of elevation in lipids and lipoproteins [4]. Dyslipidaemia is a well-recognized and modifiable risk factor that should be identified early to institute aggressive cardiovascular preventive management [5]. The most typical lipoprotein pattern in diabetes, also known as diabetic dyslipidemia or atherogenic dyslipidemia consists of moderate elevation in triglyceride levels, low HDL cholesterol values, and small dense LDL particles [6]. Type 2 DM is associated with a marked increased risk of cardiovascular disease (CVD). Thus the management of diabetic dyslipidaemia is a key approach in preventing CVD in individuals with Type 2 DM.

The aim of study was to detect the lipid abnormality in diabetic patients. Early detection and treatment of hyperlipidemia in diabetes mellitus can prevent the progression of lipid abnormalities and minimize the risk for atherogenic cardiovascular disorder and cerebrovascular accident.

2 Materials and Methods

This study was done in Murjan general teaching hospital in Babylon province. The collection of

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samples was conducted during the period from February to August / 2014. The study was conducted on 51 patients from the diabetic clinic in the mentioned hospital .All patients were positive with type 2 diabetes from which 21 males and 30 females. The ages of patients were ranges between 35—70 years old. The medical history of each patient was taken which include age, gender, and duration of disease, type of treatment, family history, and history of any other illness. Measurements of height and weight were done to calculate body mass index, measurement of blood pressure also done before takes samples of blood and urine, Blood pressure was measured after 30 min. rest, and the measurement was performed by using Mercury sphygmomanometer. Samples were collected in fasting status. The first morning urine was collected in disposable containers from diabetic patients. Microalbuminuria was measured by using semi-quantitative dry immunochemical screening strips (MICRAL-TEST marker made in Germany). Serum glucose was estimated by enzymatic color test on basis of Trinder reaction and the glucose Kit was the Biocon marker made in Germany. HbA1cwas measured by using quantitative colorimetric determination of glycohemoglobin in whole blood and the HbA1cKit was the Stanbio marker made in USA. Serum glucose and HbA1cwere measured by photoelectric colorimeter from design APEL, AP 101/ Japan. Fasting lipid profile including, total cholesterol, triglycerides, high density lipoprotein cholesterol, low density lipoprotein cholesterol and very low density lipoprotein cholesterol. , Dyslipidaemia (Abnormal lipid profile) was defined using the National Cholesterol Education Programme – Adult Treatment Panel III (NCEP – ATP III) (National Cholesterol Education Programme, 2002) criteria as follows; Total cholesterol > 5.3mmol/L, Low density lipoprotein > 3.30mmol/L, High Density lipoprotein < 1.0mmol/L and Triglycerideres > 1.78mmol/ L, Very low density lipoprotein cholesterol <0.5 mmol/L. [7].

3 Statistical Analysis

The statistical analysis were performed by using SPSS program (Version 16.0) and the statistical processes used here were Means, Standard deviations, ,one away a nova ,Independent sample T-Test.

4 Results

Clinical characteristic of patients:

A total sample (n=51) of diabetic patients consist of 43.4% (n=33) males and 56.5% (n=43) females. 68.6% of the total samples have a family history for diabetes mellitus. In this study the percentage of patients who have hypertension with diabetes were 74.5 % (n=38) dependent on The American Diabetes Association[8] ,defined hypertension in diabetic patients as blood pressure (BP) ≥ 140/90 mmHg and a target BP goal of < 130/80mmHg is reasonable , or if the patient is on the treatment with antihypertensive drugs. The percentage of patients who have microalbuminuria more than 20 mg/l were 60.7 % (n=31). The percentage of patients who have glycated hemoglobin (HbA1c) <7% (Good control) was 31.3 % (n=16), While patients who have HbA1c>7% (Poor control) were 68.6 % (n=35) dependent on the assessment of glycemic goals mentioned by American Diabetes Association [9]: The HbA1cgoal for patients in general is an HbA1cgoal of <7% .The percent of BMI groups were underweight 0 % (n=0), normal weight 29.4 % (n=15), overweight 37.2 % (n=19), obesity 33.3 % (n=17) and Extreme obesity 0% (n=0) (Table1). the percentage of patients who have Dyslipidaemia were 74.5 % (n=38), The percent of patients who have high cholesterol 39.2 % (n=20) ,high triglyceride 58.8 % (n=30) ,Low HDL 39.2 % (n=20) , High LDL 35.2 %(n=18) ,high VLDL 60.7% (n= 31).(Table 2).

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TABLE 1: Clinical Characteristics of Diabetes Mellitus Type 2 Patients.

Item	NO.	Percent %
Type of Diabetes mellitus		
Type 2	51	100
Gender		
Male	21	41.1
Female	30	58.8
Family history		
Present	35	68.6
Non-present	23	45.0
Hypertension		
Present	38	74.5
Non-present	23	45.0
Hypoglycemic drugs		
Taken oral hypoglycemic drugs	40	78.4
Not using any medication	11	21.5
Micro albuminuria		
Present (> 20 mg/ L)	31	60.7
Non- present (≤ 20 mg / L)	20	39.2
HbA1c		
Good control (< 7%)	16	31.3
Poor control (> 7%)	35	68.6
BMI		
Under Weight < 18.5 Kg/ m	0	0
Normal Weight (18.5-24.9 kg/m2	15	29.4
Over Weight (25-29.9 Kg/ m2)	19	37.2
Obesity (30-39.9 Kg/ m^2)	17	33.3
Morbid Obesity > 40 Kg/ m2)	0	0

TABLE 2: pattern of hyperlipidemia in patients with diabetes mellitus.

Lipid profile	N=51	%
High cholesterol	20	39.2
High triglyceride	30	58.8
High LDL	18	35.2
Low HDL	20	39.2
High VLDL	31	60.7
Total Dyslipidemia	**38**	**74.5**

TABLE 3:pattern of hyperlipidemia in male & female diabetic patients.

Gender	High cholesterol	High triglyceride	High LDL	Low HDL	High VLDL
male	8 (38 %)	12 (57.1%)	11 (52.3%)	8 (38%)	13(61.9 %)
Female	12 (40%)	18 (60%)	7 (23.3%)	12 (40%)	18 (60%)

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Table 4: Clinical Characteristics of Diabetes Mellitus Type 2 Patients.

Parameter	Control Group (n=25)	Patients Group (n=51)	P- value
Age (years)	48.7± 8.38	51.55 ± 8.8	----
Male %	48 %	41.1 %	-----
Female %	52 %	58.8 %	-----
BMI (Kg / m²)	24.0 ± 2.09	29.40 ± 2.98	P<0.001
Fasting blood glucose (mmol/L)	4.62 ± 0.16	10.61±13.47	P<0.001
HbA1c %	5.71 ± 0.61	8.11±1.35	P<0.001
Microalbuminuria	10.00±00	70.58 ± 27.08	P< 0.001
Systolic blood pressure	132.0± 8.03	164.0 ±19.10	P<0.001
Diastolic blood pressure	78.94 ± 17.03	93.98 ± 6.43	P<0.001
Cholesterol	5.08 ± 0.58	6.93 ± 1.26	P<0.001
Trigreserol	1.37 ±0.38	2.59 ±0.71	P<0.001
HDL	1.01 0.17	0.78 ± 0.34	P<0.001
LDL	2.48 ± 0.79	3.37 ± 1.56	P= 0.002
VLDL	0.37 ± 0.14	0.61 ± 0.77	P= 0.04

NS= Non-significant. The significant differences at P-value <0.05.

5 Discussion:

Lipid abnormalities contribute to the increased risk of cardiovascular disease in type 2 diabetes, in this study the prevalence of Dyslipidemia was 74.5% diabetic patients and this result agree with other studies undertaken in Tamale, Ghana 68.3%, Edo, 60.4% and Lagos 89.1% all in Nigeria and South Africa 90.3% respectively [10-12].

in our study serum cholesterol level >5.3 mmol/ L was found in 39.2% patients with type-2 diabetes and serum TG was raised in 58.8%,and serum HDL ,LDL and VLDL was 39.2% , 35.2%, 60.7 % Receptively. A study conducted in Nishtar Hospital, Multan by Ahmad et al., showed that 21% patients with type-2 diabetes had raised serum cholesterol (>200mg/dl) and 34. 2% patients have raised triglycerides in serum (>150mg/dl) [13]. Another study conducted at Hazara division Pakistan on "Frequency of dyslipidaemia in type 2diabetes mellitusin patients of hazara division" showed that serum triglyceride was raised in 59% [14].

In our study , serum TG levels were found to be raised among female patients as compare male (60 %Vs 57.1%) also total cholesterol (40% Vs 38%) ,HDL (40% Vs 38%) , Our results are partly consistent with a study by Firdous et al., who reported that adverse effects of diabetes mellitus on dyslipidaemia are more marked in women than men [15].

while, males had higher levels of LDL-C as compared to females.(52.3% VS 23.3%) This finding was consistent with that by Ahmad et al. [16] .

In our study we found a significant elevation in Fasting blood pressure,HbA1c , Blood pressure ,Microalbuminuria, BMI, lipid profile in diabetic patients as compare to control. (table4).

High blood glucose in adults with diabetes increases the risk for heart attack, stroke, angina, and coronary artery disease. [17]

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In another study it was observed that uncontrolled diabetes will lead to higher vascular (macro and micro) complications and was related to longer duration of diabetes, poor control, increased weight and high blood pressure. The vascular complications were ischemic heart disease, myocardial infarction and cerebrovascular accident.[18].

The abnormal lipid profile observed in Type 2 DM may be related to hyperinsulinemia and insulin resistance, which has been closely associated with diabetic dyslipidaemia and Hypertension [19]. Lipoprotein lipase (LPL) an insulin dependent enzyme which together with insulin resistance leads to increase triglyceride levels (TG) results in Type 2 DM having high levels of TG. HDL levels may be further reduced in DM due to elevated hepatic lipase activity that catalyzes HDL [20]. elevated TG have been reported in Type 2 DM patients as probable cause of CVD [21].

CONCLUSION : Outcome of this study showed that majority of type 2 diabetes mellitus patients had their lipid levels deranged.

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