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# Study the Changes in Levels of Lipid Profile and Liver Enzymes in Type 2 DM.

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**Abstract.** Background: Diabetes mellitus type 2 is described by hyperglycemia together linked with dyslipidemia and troubled liver function. Lipid profile raises is a prevalent finding in more diabetic patients. The dysfunction in liver may go to convert activity of jointly lipids and glucose. The liver manipulates a master part in the management of metabolism of the carbohydrate. The disorder in function of liver may affect lipid parameters. **Methods:** 88 women patients of diabetes mellitus type 2 admitted in this research their ages were 68 years old with same sex considered as a healthy group. The outcome obtained gave us a good link in the midst profile of lipids and enzymes of liver in diabetic patients. Conclusion: The liver enzymes tests analyses are in fact help with lipid profile as well as to hemoglobin glycosylated.

**Key words:** - Type 2 DM, Liver enzymes, Lipid profile.

## INTRODUCTION

Diabetes mellitus is known as a disease in metabolic with inveterate an excess of glucose in the bloodstream which result from lower levels of insulin output by pancreas in beta cells , It characterized with unrest in carbohydrate, protein and fat metabolism as a result from trouble in secretion or action of insulin [1]. The prolong hyperglycemia of Type 2 diabetes is leads to long- dated disadvantage, failure or dysfunction of various organs, such as heart, nerves, eyes, kidneys, blood vessels [2].The prevalence according World Health Organization was announced by the year 2025 should be 380 million humans in our world will be embody as this disease [3]. During an expansion extent worldwide, diabetes mellitus diseases will be an imaginable leads in future a causes of mortality and morbidity [4].The liver move a high part of carbohydrate metabolism regulation, it have the power to repository sugar as glycogen, furthermore, glucose synthesise from another sources [5].Several researches had exhibited liver diseases play a live part in mortality and morbidity of type 2 diabetes patients [6,7].

The disease scope in liver of diabetic contain abnormal liver enzymes, chronic mild uplift of transaminases is usually show in diabetes mellitus type II [8]. The both enzymes (AST) and (ALT) are augury of injury in hepatic [9]. Moreover, the diabetic dyslipidemia are commenced by the increased of triglyceride loaded (VLDL) from hepatic over output [10,11].

Type II diabetes mellitus is immediately combined by dyslipidemia lead to waste the effect of insulin, changes pattern lipoprotein atherogenic and uplift some enzymes of liver have been fixed as risk factors liberated for evolution of cardiovascular disease [12]. Newly, liver harm has been known as one of the complication major of Type II diabetes mellitus, with gauge mortality ratio for cirrhosis greater than that for cardiovascular disease [13].The goal of this treatise is to inspect, the changes in enzymes liver serum, and profile of lipid in diabetes patients.

## PATIENTS AND SAMPLES COLLECTION

This prospective research was achieved in laboratory of physiology in Basra medical college. 88 women patients of type 2 diabetes mellitus coming to this lab midst the interval of December 2019 to February 2020 was taken at the search, also in this study 68 sex and age matched healthful controls groups were included. The diagnoses of patients with type II diabetes not less than 5 years. Patients anguish from jaundice, liver cancer, liver cirrhosis, hepatitis B or C, other chronic illness and alcohol intake, under treatment of remedy effecting normal liver metabolism, were preclude at the search.

Topics studied were classification as diabetes patients by the association American diabetes of fasting blood sugar 80-120 mg/l. After overnight fasting, venous blood sample about 6 ml was collected in disposable plain tube, for the estimation of HbA1c, 1 ml of sample was transferred into a clean anticoagulant tube (provided with EDTA), While the remainder blood was transfused into disposable gelatin tube. At room temperature left it 30 minutes for clotting at least, centrifuged (3500 r/m for 10 minutes) then the produced serum was stored at (- 20 C<sup>0</sup>) unless used directly , this serum was then used in biochemical tests.

## CHEMICAL AND TECHNIQUES

Serum analysis for fasting glucose, TG, TC, HDL, LDL, VLDL, AST, ALT, and ALP was complete by analyzer fully automated , the modern Cobas Integra analyzer 400 Plus (Roche – Germany) has been employed, HbA1c was estimated by direct enzymatic method. These trials were conducted in a specialist laboratory while kits by ROCHE procured [14].

## STATISTICAL ANALYSIS

The data has been represented as mean  $\pm$  SD values by the use of a statistical package SPSS ver. 16 description statistics. To study association of diabetic and liver functions, the ANOVA test one way was used. P-value if  $\leq 0.05$  will be statistically considered significant.

## RESULTS

The parameters considered as biochemical comprise fasting blood glucose, HbA1c, triglyceride, total cholesterol, VLDL, LDL, AST, ALT and ALP was elevate significantly in diabetes women, while HDL are significantly lowered in diabetic women as compared to healthy in table (1).

TABLE 1. Changes in blood sugar parameters between healthy and diabetes mellitus women.

Parameters	Control	Cases
FBS (mg/dl)	76.3 $\pm$ 7.81	*162.5 $\pm$ 4.42
HbA1c %	4.4 $\pm$ 1.18	*8.1 $\pm$ 6.82

\* Indicates a significant differences at the level of probability in ( $p \leq 0.05$ )

**TABLE 2.** Changes in lipid profile parameters between healthy and diabetes mellitus women.

Parameters	Control	Cases
TG (mg/dl)	122.6 ± 11.2	*177.2 ± 4.91
TC (mg/dl)	181.7 ± 5.97	*264.3 ± 13.8
VLDL (mg/dl)	19.2 ± 7.98	*43.8 ± 2.63
LDL (mg/dl)	106.7 ± 12.1	*133.3 ± 16.71
HDL (mg/dl)	56.2 ± 1.99	**29.3 ± 8.23

\* Indicates a significant differences at the level of probability in ( $p \leq 0.05$ )

**TABLE 3.** Changes in liver enzymes parameters between healthy and diabetes mellitus women.

Parameters	Control	Cases
AST (U/L)	27.5 ± 6.51	*51.8 ± 13.37
ALT (U/L)	18.6 ± 4.72	*40.5 ± 5.87
ALP (U/L)	91.8 ± 10.61	*122.6 ± 6.11

\* Indicates a significant differences at the level of probability in ( $p \leq 0.05$ )

## DISCUSSION

The biochemical parameters in this study compared, blood sugar, liver enzymes tests and lipid profile between non-diabetic and diabetic patients. The level of profile lipid may be serious variables at recognize the association to liver enzymes in patients with diabetic.

The abnormalities of lipid profile and liver enzymes are due to relationship to insulin and hyperglycemia which are increased in biochemical parameters compared with control cases [15]. It has been debated that high lipid levels with post meal and high blood sugars considered a risk factors for many diseases.

several studies was spotted that diabetes uncontrolled should lead to higher vascular (micro and macro) complexity, it was concerning to longer term of diabetes, poor monitoring, high blood pressure and increased weight [16]. Evidence of our study that type 2 diabetics patients have changes in parameters of cholesterol level, LDL, TG, VLDL, AST, ALT and ALP by recorded increase significantly. HDL showed decrease in level compared with control cases.

However, it was fixed that the expansion of ALT, AST, ALP enzyme vigor in diabetic patients was high, the reversible transamination between this enzymes having a serious function in gluconeogenesis and amino acid metabolism [17]. The equilibrium of the enzymes reaction is mostly appear in liver but its effectiveness although much diminish, the precursor for gluconeogenesis is alanine ,it is increased in subjects with T2DM [18].

ALT as well ability organize as a compensative echo to the macerate insulin signaling in hepatic or, as another option or possibility, perhaps drain more simply abroad of the hepatocytes as a resultant, following hurt and fatty infiltration [19].

On the other hand the profile of lipid in patients with type II diabetic are symmetric with hemoglobin A1c, the prime reason for uncontrolled type II diabetics, not attain main points could be loss of precept and will to control sugars in blood [20].

Arrangement of cholesterol upload in T2DM has amended in latest years, the resistance of insulin is serious factor in type2 diabetic patients, these factor reliefs of free fatty acids through fatty tissue, break insulin liable to uptake of muscle for free fatty acids and excess it to release in the tissue of hepatic cells [21,22]. The diabetes mellitus could be boost into media awareness, so that the levels of sugar in the blood may be cramped to perform into helpful monitoring of lipid grades that will be conclude into another elaboration [23].

## CONCLUSION

Enzymes liver is elevated in the patients of T2DM. Also lipid profile has significantly changes in diabetic patient with high parameters compared with control cases. Early detection of diabetic mellitus and liver abnormality will assist to inhibit further headway to chronic liver disease.

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