Study of Liver Function Tests and Renal Function Tests in diabetic type II patients

Dhamyaa Hadi Salih

Anatomy Depart.- College of Medicine- Baghdad University-Iraq.

Abstract: *In individuals who have diabetes type 2, they are a higher incidence of liver function test abnormalities than individuals who do not have diabetes. The most common liver function tests (LFTs) include the serum aminotransferases, alkaline phosphatase, bilirubin, albumin, and prothrombin time. Aminotransferases, such as alanine aminotransferase (ALT) and aspartate aminotransferase (AST), measure the concentration of intracellular hepatic enzymes that have leaked into the circulation and serve as a marker of hepatocyte injury.*

The study was done on (55) blood samples which divided in two groups: first group was (40) the patients (diabetic typeII) (25 females &15 males) and the second was (15) the control group which(8 females &7 males) , glucose , Urea, Creatinine, Alkaline phosphates ,ALT and AST were measured in these groups.

there is no significant difference between females and males in controls and patients, there is significant difference between the controls group and the patients and the correlation between the glucose and biochemical parameters in female patients was glucose levels were positive significant correlated with Creatinine, Alkaline phosphate, ALT and AST, but non- significant with Urea, but In males the correlation between the glucose and all biochemical parameters even Urea. As conclusions there is relationship between the glucose and biochemical parameters above .

***Key words:**, Alkaline phosphates ,ALT , AST ,Creatinine , glucose , Urea,.*

I. Introduction:

Liver function tests (LFTs) are commonly used in clinical practice to screen for liver disease, monitor the progression of known disease, and monitor the effects of potentially hepatotoxic drugs.
The most common LFTs include the serum aminotransferases, alkaline phosphatase, bilirubin, albumin, and prothrombin time. Aminotransferases, such as alanine aminotransferase (ALT)
and aspartate aminotransferase (AST), measure the concentration of intracellular hepatic enzymes that have leaked into the circulation and serve as a marker of hepatocyte injury(1).

Now days many researches study the risk factors in type 2 diabetes such as : evaluation new diet to stop Hypertension eating pattern on inflammation and novel cardiovascular risk factors in diabetic type 2 patients(2), Nonalcoholic fatty liver disease (NAFLD), especially nonalcoholic steatohepatitis, is a recognized risk factor for hepatocellular carcinoma (HCC)(3).

Individuals with type 2 diabetes have a higher incidence of liver function test abnormalities than individuals who do not have diabetes. Mild chronic elevations of transaminases often reflect underlying insulin resistance. Elevation of transaminases within three times the upper limits of normal is not a contraindication for starting oral antidiabetic or lipid modifying therapy. In contrast, antidiabetic agents have generally been shown to decrease alanine aminotransferase levels as tighter blood glucose levels are achieved(1).

II. Patients and methods:

2-1- **Patients**: In this study (55) blood samples(the serum) were collected and divided in two groups:
(15) the control group which(8 females &7 males) & (40) the patients(diabetic typeII) group who they were received in the out-patient clinic in Baghdad hospital during the period from October-December 2011, they were (25 females &15 males).

2-2- Methods:

A blood sample was collected after an overnight fast ≥ 8 h .Blood glucose level was measured with enzymatic oxidation(4), and creatinine was analyzed by the modified kinetic Jaffe reaction method (5). Urea was measured by enzymatic method using a kit supplied by biomMerieux Sa-France (6).
Serum level of ALT(G.P.T)and AST (G.O.T) concentration were assayed based on dinitrophyenyl hydrazone a coupling calorimetric method (by Randox-United Kingdom) using this technique .Serum level of ALP was determined by calorimetric method using phosphatase alkaline –kite provided by Biomerieux-France GOT (7).

2-3- **Statistical analysis:**

Statistical analysis of the results was done by using Excel software   to analyze the results of biochemical parameters in patients.

III.   Results:

Table (1) and figures (1&2) were show to us the mean ± SD of biochemical parameters that involve in this study,(females and males) in both groups .

Table (2) shows the correlation between glucose and other biochemical parameters in females and males.

Table-1- show the values of biochemical parameters involved in   this study in females and males (controls & patients) as (mean± SD) grouped.

Parameters	Females/ Controls (No.=8)	Females/ Patients (No.=25)	Males/ Controls (No.=7)	Males/ Patients (No.=15)
Serum Glucose (Fasting)	92.75±8.119	217.6±57.52	93.86±12.98	235.33±93.53
Blood Urea	30.375±33.09	30.52±13.06	30.86±34.06	58.26±115.89
Serum Creatinine	0.762±39.6	0.84±17.56	0.86±40.46	1.88±117.14
Serum Alkaline Phosphatese	61.375±36.66	90.46±41.55	65±37.61	97.33±104.06
Serum ALT(G.P.T)	6.5±36.458	18.16±37.6	5.71±38.3	22.13±98.15
Serum ST(G.O.T)	8.84±35.15	19.76±34.38	12.25±35.22	28.47±97.78

- Serum Glucose(Fasting) mg/dl.
- Serum Urea mg/dl.
- Serum Creatinine mg/dl.
- Serum Alkaline phosphatase IU/L.
- Serum alanine glutamate transferase(G.P.T) IU/L.
- Serum Aspartate glutamate transferase(G.O.T) I U/T.
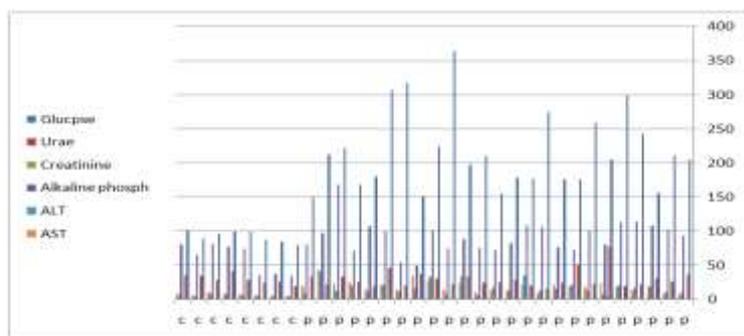- p-value≤0.05.

Fig-1- Biochemical parameters involved in   this study in females (C:controls &P: patients).
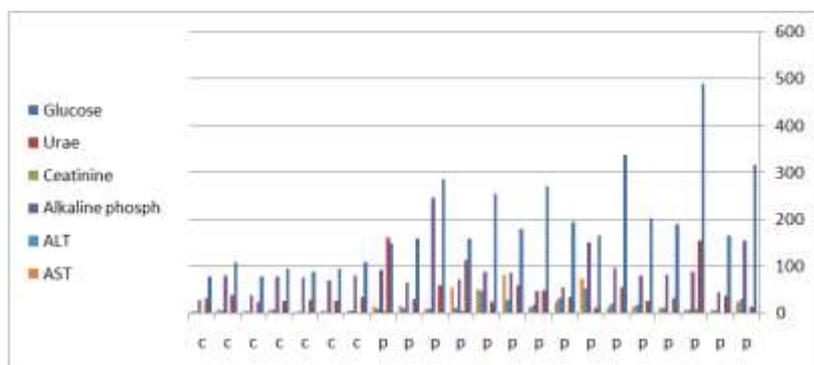

Fig-2- Biochemical parameters involved in   this study in males (C:controls &P: patients).

Table-2- The correlation between Glucose and other biochemical parameters in females and males.

Correlation	r-value in Females	r-value in Males	p-value
Glucose & Urea	- .109 (Non-sign)	0.398	≤ 0.05
Glucose & Creatinine	0.04	0.572	≤ 0.05
Glucose & Alkaline Phosphate	0.455	0.396	≤ 0.05
Glucose & ALT	0.307	0.295	≤ 0.05
Glucose & AST	0.282	0.056	≤ 0.05

IV.   Discussion:

In this study we had tried to study the correlation between the glucose and biochemical parameters such as Serum Urea ,Serum Creatinine , Serum Alkaline phosphatase , Serum alanine glutamate transferase and Serum Aspartate glutamate transferase(G.O.T) in two groups: the first is the patients which are females and males who had diabetic type 2 and the second are the controls which are females and males who are healthy. We have tried to address three important issues:

First: a (40) patients of type 2 diabetes as experimental group (table -1- (fig-1 &2)) and (15)controls, there is no significant difference between females and males in both groups(controls and patients).

Second : there is significant difference between the controls group and the patients group as shown in table-1.

Third : table-2- shows the correlation between glucose and other biochemical parameters in female patients. Glucose levels were positive significant correlated with Creatinine, Alkaline phosphate, ALT and AST, but non-significant with Urea.

In males table-2- show the correlation between glucose and all biochemical parameters in male patients even Urea.

In conclusion: the present investigation revealed that there is relationship between the glucose and biochemical parameters which is mention above and there is a relationship between glucose and Creatinine, Alkaline phosphate, ALT and AST in both females and males who had type2 diabetes , but there is no relationship between glucose and Urea in females only.

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