A study of Biochemical parameters in some common Diseases in Baghdad

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Abstract

This study is indicated to study the changes in the concentration of some biochemical analyses in few diseases like (Diabetes mellitus (DM), liver disease, kidney failure (KF), leukemia and vascular disease). The study is conducted at the Special Nursing Hospital, Medical City, Baghdad on 108 patients and 22 apparently healthy control; November 2017- April 2018. The study included fasting blood glucose (FBG), serum alkaline phosphatase (ALP), glutamate oxaloacetate transaminase (GOT), glutamate pyruvate transaminase (GPT), Blood urea & serum creatinine. The results in comparison with the control showed: Increased FBG in DM patients, followed by kidney failure then followed by vascular disease patients (P<0.01).Increased blood urea in the KF patients, followed by DM (p<0.01).Also, increased creatinine in the kidney failure patients only (p<0.01), increased S. alkaline phosphatase in leukemia then vascular disease followed by liver disease (p<0.05), increased SGOT in vascular disease and then liver disease patients (p<0.05),increased SGPT in kidney failure and then liver disease (p<0.05). We concluded from this study that despite the participation of some diseases in certain clinical parameters, it is possible to differentiate between these diseases in terms of the amount of increase and decrease of these parameters for each disease and compare them with other diseases and normal range of these parameters.

***Keywords**: Biochemical Parameters, diseases.*

دراسة المعايير الكيمياء الحيوية لبعض الامراض الشائعة في بغداد

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الخلاصة

تم دراسة التغيرات الحاصلة في تراكيز بعض المعايير الكيمياء الحيوية في مصول مرضى السكري والكبد والفشل الكلوي ومرض الاوعية الدموية وسرطان ابيضاض الدم . الواردين لمستشفى التمريض التخصصي لمدينة الطب ببغداد للفترة من تشرين الثاني 2007- نيسان 2008 وعددهم (108) مريضاً و (22) سليماً ظاهرياً . تم فحص مصولهم لمادة السكر واليوريا والكرياتنين و انزيمات الكبد (ناقل الامين الاوكزالات GOT والبايروفيت GPT والفوسفات القاعدي ALP) بعد صيامهم لست ساعات, أظهرت نتائج المرضى بالمقارنة بالاصحاء :زيادة سكر الدم الصائم في مرضى السكري يعقبهم مرضى الفشل الكليوي ثم مرضى الاوعية الدموية (p<0.01) زيادة اليوريا في مرضى الفشل الكليوي ثم السكري (p<0.01) .زيادة الكرياتنين في مرضى الفشل الكليوي دون غيرهم (p<0.01) .زيادة انزيم الفوسفاتيز القاعدي لمرضى ابيضاض الدم يعقبهم

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الاوعية الدموية ثم الكبد ($p<0.01$) .زيادة انزيم GOT في مرضـــى الاوعية ثم الكبد ($p<0.05$) وزيادة انزيم GPT في مرضى الفشل الكلوي ثم الكبد ($p<0.05$).

الكلمات المفتاحية: *المعايير الكيمياء الحيوية , الامراض.*

Introduction

Diabetes is a group of diseases that affect the utilization of glucose, resulted from defects in insulin secretion or action, this condition known medically as (Diabetes mellitus) [1]. Liver is involved with almost all biochemical processes and pathways it is no wonder that there are many different diseases that will affect it. [2]. The kidneys main function is to eliminate excess fluid and waste material from blood. When kidneys lose their filtration ability, dangerous levels of fluid and urea and cereatinine accumulate in the body, a condition known as kidney (renal) failure. [3].

Leukemia is a disease involved the blood forming tissues, including the bone marrow and lymphatic system. In leukemia bone marrow produces a large number of abnormal white blood cells, thus don't function properly. Eventually, they block production of the normal white blood cells, impairing ability against infection. [4].

Subjects, Materials, & Methods

Selection of subjects: Subjects were (130), 108 patients and 22 apparently healthy controls chosen from the relatives of the patients attending the outpatient clinic / Medical City, Baghdad, during span of sex months (Nov, 2017 to April 2018).

On a mutually agreed day, the subjects were asked to remain in overnight fasting state. Blood samples were drawn by disposable syringe and put in (10 ml) disposable plain tube for glucose, urea, creatinine, alkaline phosphatase, GOT & GPT.

Materials

Were chosen from authorized sources, RANDOX & Bio Maghreb, the material enough for all the samples.

Methods

Enzymatic methods following kit procedures.

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Results

Table (1): Mean distribution of fasting blood glucose conc. (mg/dl) according to studied groups.

Studied Groups	No.	Mean mg/dl	Std. Deviation	Std. Error	Comparison of sign.(t-test)	
					P-value	Sig.
Control	22	85.55	11.43	2.44	-	-
Kidney Failure	42	135.36	82.21	12.69	0.006	HS. (p<0.01)
Diabetes M.	15	232.08	132.87	38.36	0.00	H.S. (p<0.01)
leukemia	22	89.86	24.97	5.32	0.833	N.S. (P>0.05)
Vascular disease	12	213.00	14.17	18.41	0.00	H.S. (p<0.01)
Liver disease	17	111.18	44.23	10.73	0.245	N.S. (P>0.05)
Total	130					

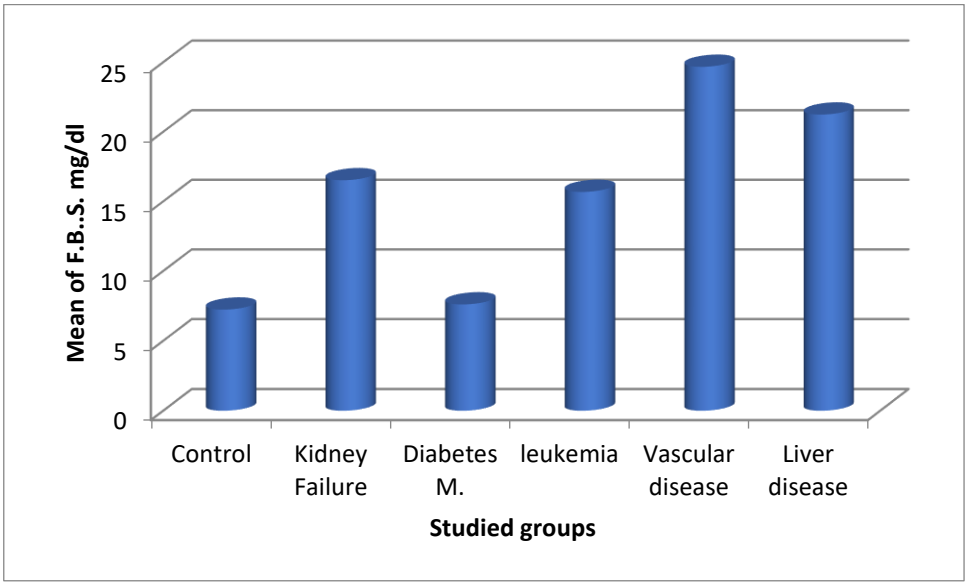

Fig. (1): Mean distribution of F. blood glucose conc. (mg/dl) according to studied groups.

Table (2): Mean distribution of blood urea conc. (mg/dl) according to studied groups.

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Studied groups	No.	Mean mg/dl	Std. Deviation	Std. Error	Comparison of sign (t-test)	
					P-value	Sig.
Control	22	28.55	4.61	0.98	-	-
Kidney Failure	42	105.76	64.16	9.90	0.00	H.S..(p<0.01)
Diabetes M.	15	71.20	71.62	32.03	0.046	S.(p<0.05)
Leukemia	22	34.27	27.22	5.80	0.658	N.S. (P>0.05)
Vascular disease	12	35.42	12.83	3.70	0.655	N.S.(P>0.05)
Liver disease	17	29.88	9.14	2.22	0.923	N.S.(P>0.05)
Total	130					

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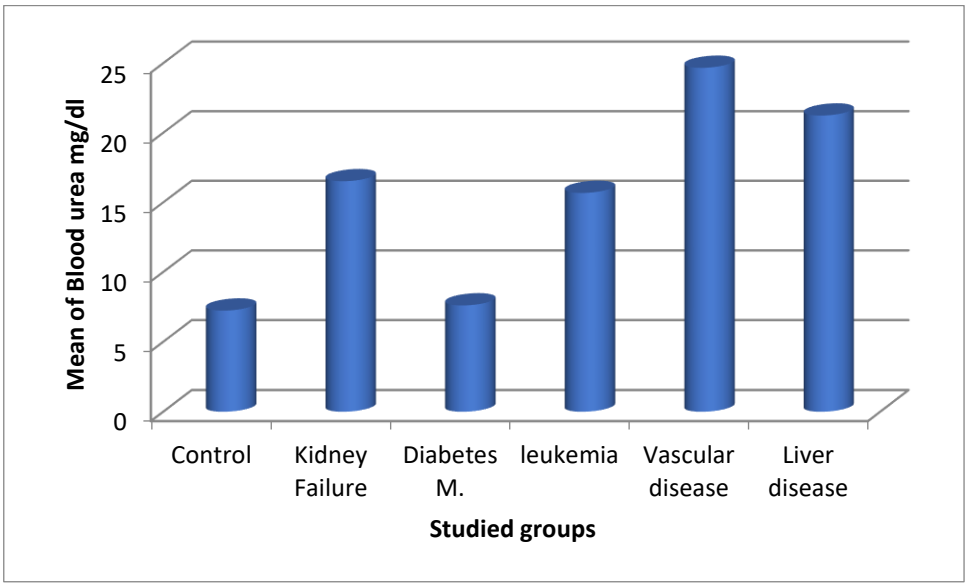

Fig. (2): Mean distribution of blood urea conc. (mg/dl) according to studied groups.

Table (3): Mean distribution of serum creatinine conc. (mg/dl) according to studied groups.

Studied groups	No.	Mean mg/dl	Std. Deviation	Std. Error	Comparison of sign. (t-test)	
					P-value	Sig.
Control	22	0.659	0.182	0.038	-	-
Kidney Failure	42	8.026	8.869	1.368	0.00	H.S..(p<0.01)
Diabetes M.	15	5.160	9.421	4.213	0.122	N.S.(P>0.05)
leukemia	22	1.009	0.674	0.144	0.843	N.S.(P>0.05)
Vascular disease	12	1.442	2.415	0.697	0.709	N.S.(P>0.05)
Liver disease	17	1.953	3.799	0.921	0.494	N.S.(P>0.05)
Total	130					

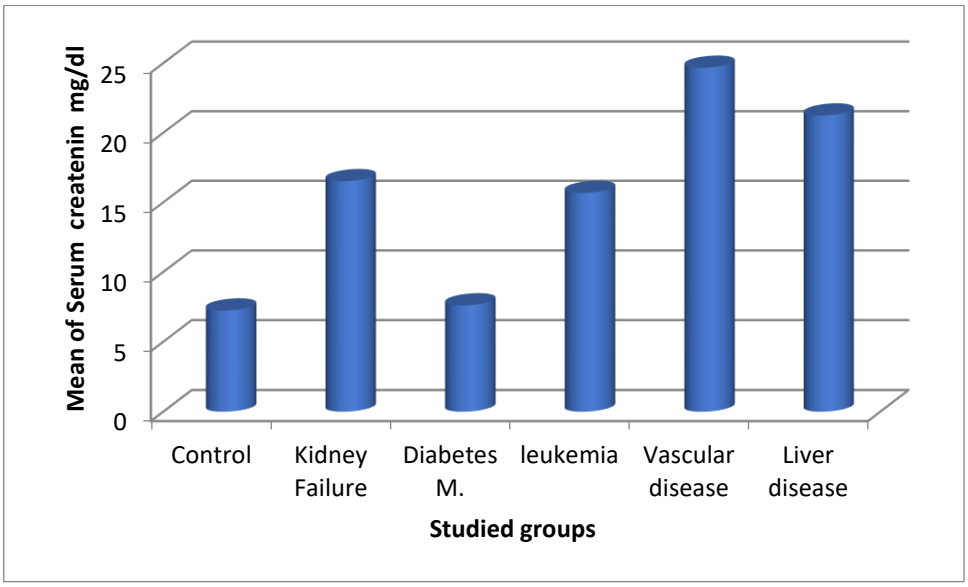

Fig. (3): Mean distribution of blood creatinine conc. (mg/dl) according to studied groups.

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Table (4): Mean distribution of serum alkaline phosphatase enzyme (I.U/L) according to studied groups.

Studied groups	No.	Mean I.U/L	Std. Deviation	Std. Error	Comparison of sign.(t-test)	
					P-value	Sig.
Control	22	51.55	8.62	1.84	-	-
Kidney Failure	42	71.02	45.26	6.98	0.153	N.S.(P>0.05)
Diabetes M.	15	71.00	32.02	14.32	0.447	N.S.(P>0.05)
leukemia	22	107.36	79.67	16.99	0.00	H.S..(p<0.01)
Vascular disease	12	89.58	49.99	14.43	0.042	S.(P<0.05)
Liver disease	17	111.76	56.89	13.80	0.00	H.S..(p<0.01)
Total	130					

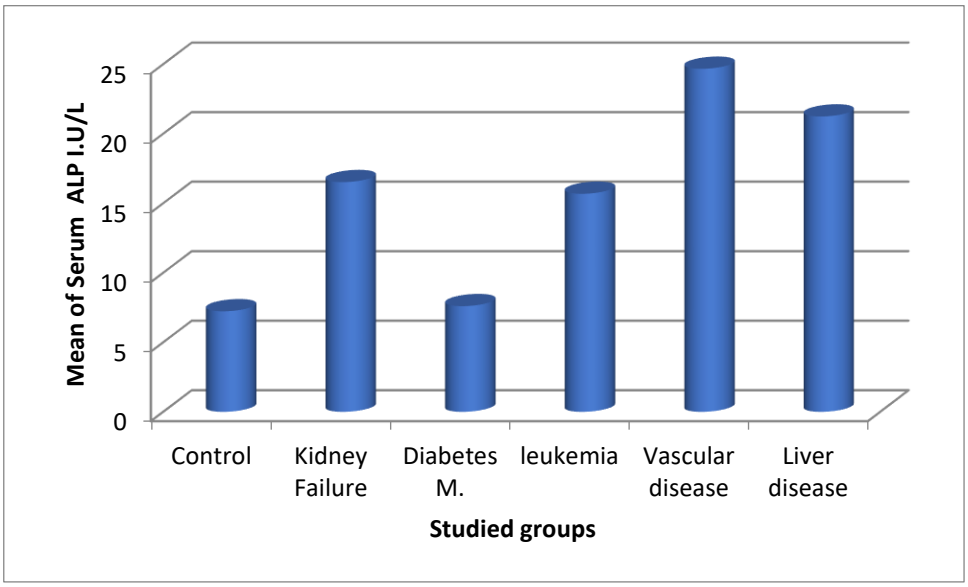

Fig. (4): Mean distribution of serum alkaline phosphatase enzyme (I.U/L) according to studied groups.

Table (5): Mean distribution of serum GPT (I.U/L) according to studied groups.

Studied groups	No.	Mean I.U/L	Std. Deviation	Std. Error	Comparison of sign. (t-test)	
					P-value	Sig.
Control	22	6.50	1.65	0.35	-	-
Kidney Failure	42	20.21	28.64	4.42	0.014	S. (P<0.05)
Diabetes M.	15	7.80	4.55	2.03	0.90	N.S. (P>0.05)
leukemia	22	12.45	8.61	1.83	0.345	N.S. (P>0.05)
Vascular disease	12	18.00	15.51	4.48	0.126	N.S. (P>0.05)
Liver disease	17	20.12	26.74	6.48	0.045	S. (P<0.05)
Total	130					

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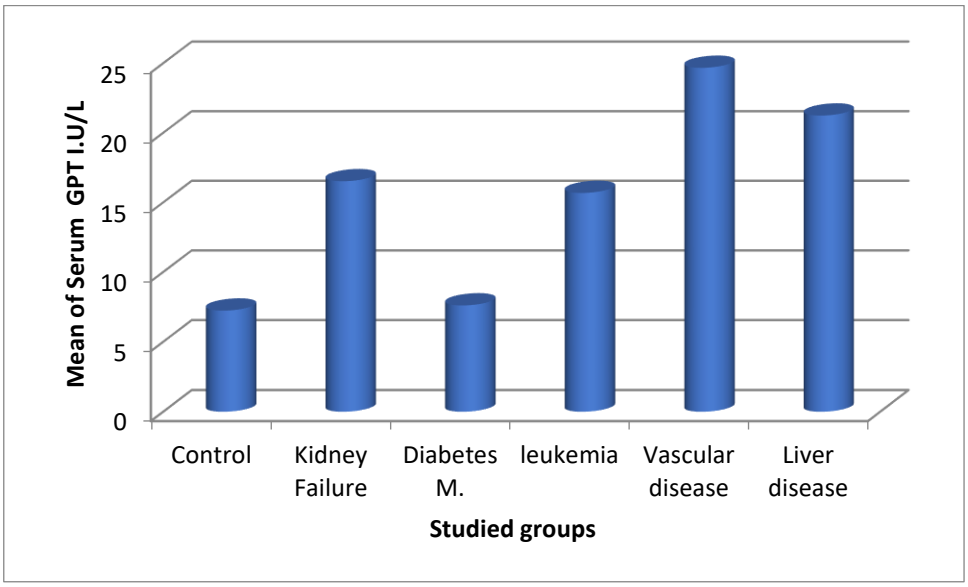

Fig. (5): Mean distribution of serum GPT (I.U/L) according to studied groups.

Table (6): Mean distribution of serum GOT (I.U/L) according to studied groups.

Studied groups	No.	Mean I.U/L	Std. Deviation	Std. Error	Comparison of sign. (t-test)	
					P-value	Sig.
Control	22	7.23	1.72	0.37	-	-
Kidney Failure	42	16.52	21.70	3.35	0.065	N.S.(P>0.05)
Diabetes M.	15	7.60	5.18	2.32	0.968	N.S.(P>0.05)
leukemia	22	15.68	15.73	3.35	0.142	N.S.(P>0.05)
Vascular disease	12	24.67	31.30	9.04	0.012	S.(P<0.05)
Liver disease	17	21.24	18.55	4.50	0.024	S.(P<0.05)
Total	**130**					

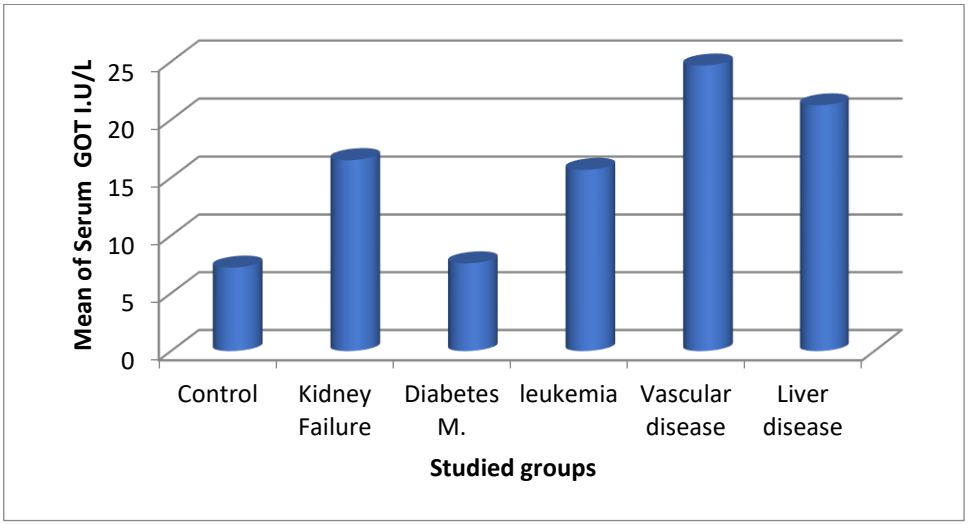

Fig. (6): Mean distribution of serum GOT (I.U/L) according to studied groups.

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Discussions

Some diseases share common symptoms with a slight difference, and the results of biochemical parameters may be similar, but these results differ in terms of the amount of each of these parameters. The current study was conducted on some patients with different diseases, and different parameters were measured on them, it was found that there is a difference in the amount of each parameter for each of these diseases. Where we found that the measurement of blood sugar was high for diabetes, followed by vascular disease, and then kidney failure, with a high significant difference in comparison with healthy peoples (table and figure1) this results were agreed with Gisela Wilcox (2005) [5]. vascular patients followed DM, possibly had a potential possibility of DM type 2, who mostly establish themselves hyperglycemic (HG) suddenly or possibly had a shocked temporary HG [6], Kidney disease is large trouble to DM, which coincides with the work of Mark E.M.et.al [7].

While the measurement of blood urea and creatinine (table and figure 2) for these groups showed a higher result of kidney failure and then diabetes with a high significant difference compared to normal people.As for the measurement of enzymes such as alkaline phosphatase (present study agree with the study conducted with Seung Hyun Kim et.al.2017) [8], GOT and GPT, they showed different results, as they showed high results for the ALP enzyme for cancer and liver diseases, while GPT showed high results for kidney failure and liver disease, followed by vascular diseases with a high significant difference compared to healthy people. As for GOT, the results showed high for vascular diseases, then liver disease and kidney failure with a high significant difference. We concluded from this study that despite the participation of some diseases in certain clinical parameters, it is possible to differentiate between these diseases in terms of the amount of increase and decrease of these parameters for each disease and compare them with other diseases and normal range of these parameters.

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