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Original Article

Evaluating the levels of physiological variables for patients with kidney failure and diabetes attending the Kidney Disease Center in Zawia city

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ABSTRAC:

Purpose: The study aimed to investigate the relationship of diabetes to kidney failure and prospective changes between the genders (males and females) attending the Kidney Disease Center in Zawia city

Methods: The study sample included 50 cases (25 males, 25 females). Seven physiological variables (normal sugar, creatinine, chloride, cumulative sugar, urea, sodium, and potassium) were evaluated.

Results: The results of blood tests showed that there are no statistically significant differences between the average results of males and females about HbA1c, urea, sodium (Na+), and potassium (K+). The result of (P) were P value = 0.132, 0.121, 0.618, respectively at the confidence level ($P \leq 0.05$), while the result of analyzes of fasting sugar, creatine and chlorine showed statistically significant differences; The significance reached 0.003, 0.000, and 0.044, respectively, and they were all less than the (0.05) significance level.

Conclusion: Diabetes is one of the diseases that humans live with, but its complications cause many serious diseases. The gender test showed that there was no difference between the average ranks of males and females in the variables of normal sugar, creatinine and chloride, meaning that all of these variables were less than the 5% significance level, while the rest of the variables were all greater than the 5% significance level, and this was for both male and female groups.

Keywords: hematological alterations, kidney failure, diabetes, glycated hemoglobin (HbA1c).

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INTRODUCTION:

Diabetes is considered one of the epidemics of the era, it is known as a chronic metabolic disease in which blood sugar levels are higher than the normal range for a long period [1]. Diabetes is characterized by a hormonal disorder and an imbalance in the metabolism of carbohydrates, proteins, fats, water, and electrolytes, accompanied by an abnormal rise in the level of glucose in the blood (hyperglycemia). In addition to high blood sugar levels, diabetes has other symptoms such as emaciation, thirst, increased urination, ketoacidosis, high blood cholesterol levels, high triglyceride levels, muscle wasting, general weakness, hunger and weight loss[2], and since it affects kidney functions from Through its effect on the capillaries, which purify the blood that is delivered to the rest of the body, this leads to a deficiency in their functions, resulting in what is known as kidney failure [3].

A diabetic patient may be exposed to complications due to organic deposits in the walls of blood vessels, which leads to damage. This type occurs in the eyes, renal filter units, and blood vessels in all organs of the body [4]. Diabetes is the main cause of kidney failure; It represents 35-45% of cases. Kidney disease in people with diabetes develops very slowly over many years and is most common in individuals who have had the condition for more than 20 years [5]. Diabetic symptoms include lack of control of blood pressure, the presence of protein in the urine, swelling of the hands, and Feet and eyes, increased urination, loss of appetite, anxiety, fatigue, difficulty concentrating, and constant itching in the body [6.7] However, it is possible to adapt to it and control blood glucose levels after clinical laboratory diagnosis, which is considered a basic necessity for providing appropriate treatment using medications, practicing sports activities, and following a healthy diet[8]. The study aimed to investigate the relationship of diabetes to kidney failure and prospective changes between the genders (males and females) attending the Kidney Disease Center in Zawia city[9].

MATERIALS AND METHODS

Data were collected from the Kidney Disease Center in Zawia city. The study sample included 50 cases (25 males, 25 females). Seven physiological variables (normal sugar, creatinine, chloride, cumulative sugar, urea, sodium and potassium) were evaluated.

Statistical analysis

This analysis aims to evaluate seven physiological variables: normal and cumulative blood, urea, Creatinine, sodium, potassium, and chloride. Data were collected from the Kidney Disease Center in Zawia city for 50 samples. The Shapiro-Wilk test for normal distribution and the Mann-Whitney test were used.

RESULT

The results of chlorine, potassium, sodium, creatinine, urea, normal, and cumulative blood in men and women were in Table 1 and Table 2 as follows:

Table (1) :First group (men)

No	Chlorine + CL	Potassium + K	Sodium + Na	Creatinine	Urea	Cumulative sugar HBA1C	Regular sugar B.SUGER
Normal rate (mg/di)	(101 -110)	(3.6 -5.5)	(135 -155)	(0.5 -1.3)	(10 -50)	(4.0 -6.0)	(75 -115)
1	98	3.5	137	0.6	45	8.96	127
2	96	5.0	137	11.2	57	6.29	147
3	100	4.6	141	10.4	63	7.44	137
4	94	4.0	136	11.8	73	8.7	165
5	101	5.0	133	10.7	52	6.16	245
6	97	4.7	140	12.3	74	6	325
7	93	4.6	142	11.0	63	8	236
8	105	4.1	137	9.7	69	6	254
9	100	4.4	136	13.1	53	7	128
10	95	5.3	141	11.8	71	7	155
11	93	4.6	138	12.3	55	8.6	557
12	105	4.0	143	11.8	76	9.6	459
13	106	5.0	139	9.6	54	7	382
14	96	4.5	133	12.1	66	8.6	336
15	103	5.6	143	10.7	54	7	140
16	99	4.7	140	11.0	79	7.9	400
17	106	4.2	137	10.2	61	5.2	214
18	100	4.9	141	11.6	58	6.2	255
19	96	3.8	139	12.7	69	7	422
20	95	3.7	143	13.6	81	8.2	102
21	106	4.6	140	11.6	55	6	257
22	102	5.3	141	12.8	77	6	359
23	111	4.8	136	10.7	57	5.6	95
24	103	4.2	139	11.8	63	6.6	181
25	108	4.8	140	9.6	52	7	309

Table (2) : The second group (women)

No	Chlorine + CL	Potassium + K	Sodium + Na	Creatinine	Urea	Cumulative sugar HBA1C	Regular sugar B.SUGER
Normal rate (mg/di)	(101 -110)	(3.6 -5.5)	(135 -155)	(0.5 -1.3)	(10 -50)	(4.0 -6.0)	(75 -115)
1	112	5.3	135	11.4	72	8.04	318
2	96	5.6	140	10.0	54	8	311
3	110	5.0	134	13.7	82	6.6	177
4	97	4.0	139	9.2	53	6.9	501
5	108	4.4	141	11.7	57	9.4	414
6	97	4.6	138	9.9	50	6.5	167
7	100	5.2	140	13.1	60	7.9	101
8	103	4.8	139	12.2	55	6.9	92
9	98	4.0	142	10.2	59	7.2	105
10	101	4.7	141	11.8	78	8.2	238
11	95	3.2	136	10.6	57	6.7	170
12	101	3.9	137	9.9	63	8	477
13	103	4.7	140	11.6	69	6.7	118
14	94	4.1	141	11.2	71	9.3	584
15	96	3.9	136	9.4	57	5.5	76
16	97	5.6	134	13.8	88	7	226
17	101	4.3	136	11.2	74	8.6	127
18	93	4.0	139	10.8	76	5.4	272
19	99	3.6	138	9.7	42	7.3	169
20	100	5.2	134	11.8	62	6.8	241
21	95	4.2	140	8.5	71	5.6	139
22	102	3.8	137	9.6	52	9.7	200
23	93	4.3	135	12.3	80	7.6	261
24	99	5.0	139	10.6	61	5.8	185
25	104	4.2	141	8.2	56	6.5	367

Diabetic nephropathy is one of the serious diseases that result in a deficiency and rise in many physiological variables such as high Creatinine and urea in the blood serum, from this research it is clear that all the physiological variables of diabetic patients (normal and cumulative sugar, Creatinine, urea, sodium, potassium and chlorine) between the male sexes and the significance level was greater than 0.05%, so there is no difference Between the average ranks of males and the women for these variables.

Normal distribution test

Table (3): Shapiro-Wilk test for normal distribution

Tests of Normality						
	Shapiro-Wilk			Kolmogorov-Smirnova		
	Statistic	DF	Sig.	Statistic	DF	Sig.
Regular sugar	0.128	50	0.040	0.923	50	**0.003**
Cumulative sugar	0.149	50	0.007	0.964	50	**0.132**
Urea	0.130	50	0.034	0.963	50	**0.121**
Creatinine	0.150	50	0.007	0.770	50	**0.000**
Sodium	0.137	50	0.020	0.957	50	**0.065**
Potassium	0.085	50	.200*	0.982	50	**0.618**
Chlorine	0.110	50	0.184	0.953	50	**0.044**

Table (3) shows the normal distribution test for the study variables. It was found that sugar, Creatinine, and chlorine reached significance of 0.003, 0.000, and 0.044, respectively. They are all less than the 5% significance level. Therefore, we reject the null hypothesis and accept the alternative hypothesis that These data do not follow a normal distribution, and therefore nonparametric methods will be used to study the differences between the male and female groups, represented by the Mann-Whitney test to study the differences between two independent groups.

It was also found that the cumulative sugar, urea, sodium, and potassium had a significance of 0.132, 0.121, 0.65, and 0.618, respectively, and they were all greater than the 5% significance level. Therefore, the null hypothesis was accepted, which states that these variables follow a normal distribution, and accordingly, it was used. The researcher used parametric methods to study the differences between the male and female groups, represented by a T-test for two independent sample

Table (4): Mann-Whitney test against regular sugar, Creatinine, and chloride according to gender

Sex	Male	Female	Mann-Whitney	Z	Sig
Regular sugar	26.6	24.4	284.5	-0.543	0.587
Creatinine	27.9	23.1	253.5	-1.146	0.252
Chlorine	26.4	24.6	290.0	-0.438	0.662

Table 4 shows the Mann-Whitney test to study the differences between two independent groups, as confirmed by the nonparametric test. It was found that the significance of the test for regular sugar, Creatinine, and chlorine reached 0.587, 0.252, and 0.662, respectively, and they were all greater than the 5% significance level. The null hypothesis was accepted, which states that there is no difference between the average ranks of males and females in these variables.

Table (5): T-test for two independent groups (males - females) against regular sugar, Creatinine, and chlorine

Sex	Mean	SD	Mean	SD	T Test	Sig
Cumulative sugar	7.12	1.17	7.29	1.19	-0.491	0.626
Urea	63.08	9.93	63.96	11.50	-0.290	0.773
Sodium	138.88	2.83	138.08	2.52	1.056	0.296
Potassium	4.56	0.52	4.46	0.63	0.560	0.578

Table 5) shows the T-test to study the differences between two independent groups as one of the parametric tests. It was found that the significance of the test for cumulative sugar, urea, sodium, and potassium reached 0.626, 0.773, 0.296, and 0.578, respectively, and they were all greater than the 5% significance level. Therefore, the null hypothesis was accepted, which states that there is no difference between the average ranks of males and females in these variables.

DISCUSSION:

From the current findings, it is clear that diabetic nephropathy results in an increase in the concentration of some physiological variables that were studied, including creatinine and urea. This is consistent with result was recorded in the study of Sakina and Asma (2017).

Through the results of this study it was also shown that there is no difference between the average ranks of males and females for these variables, and this is consistent with what was mentioned by Fikri and Mahmoud (2012), while there is a partial difference with result was stated in the study of Fatima Matouq et al. (2018), where their results showed that there are significant differences in the level of creatinine between males and females, As for the rest of the variables, there were no significant differences, such as the urea value. The reason for this partial difference may be due to a defect in the effectiveness of insulin in some patients, as high blood sugar is one of the most important reasons that lead to a change in these physiological variables.

CONCLUSION:

Diabetes is one of the diseases that humans live with, but its complications cause many serious diseases, including diabetic nephropathy. Seven physiological variables (normal sugar, creatinine, chloride, cumulative sugar, urea, sodium, and potassium) were evaluated for 50 samples. The gender test showed that there was no difference between the average ranks of males and females in the variables of normal sugar, creatinine and chloride, meaning that all of these variables were less than the 5% significance level,while the rest of the variables were all greater than the 5% significance level, and this was for both male and female groups.

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