Marked Change in Parameter Level in Patient with Renal Disease

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ABSTRACT. Failure Renal is the function of the kidneys to remove waste products and keep them on the periphery. and minerals for the body. Chronic renal failure is a syndrome characterized by a slow, irreversible deterioration of renal function due to the slow destruction of renal parenchyma. Calcium is one of the important minerals that the body contains in the blood and important tissues, and it has an important role in vital processes such as muscle contraction, nerve impulse conduction, the efficiency of heart muscle work, and blood clotting processes. The aim of the study is to study and compare calcium levels in men and women. It includes studying abnormal levels of calcium that cause many diseases, including chronic renal failure, and studying changes associated with renal failure. The method of this study was conducted on patients with chronic renal failure at Murjan Teaching Hospital in Babylon city during the period. The study included a sample of 70 patients (40 males, 30 females) with chronic renal failure, their ages ranged from 30-65, and 60 (30 males, 30 females) healthy without the disease of the same age. The result was a significant decrease in the number of red and white blood cells, hemoglobin concentration, hematocrit and platelets in patients with chronic renal failure, The result has been showed significant level in enzymes activity for transfer of amine group (alanine amino transferase, aspartate amino transferas) and phosphatase alkaline and also concentration of total bilirubin in patient with compare with healthy, Significantly increases, were found in the concentration of urea, uric acid and creatinine, as well as the concentration of calcium and phosphorous ions in the blood serum of patients compared to healthy controls.

Key words: Chronic renal failure, WBC, RBC, Hemoglobin, Platelets

INTRODUCTION

A healthy kidney works to remove waste products and baskets, to blame for the pain and relief of pain urine, and also the kidneys work to party on the day of the day Potassium, chlorine, calcium, phosphorous, and magnesium except in the body[1] and failure Renal is the function of the kidneys to remove waste products and keep them on the periphery, and minerals for the body.[2] Chronic renal failure is a syndrome characterized by a slow, irreversible deterioration of renal function due to the slow destruction of renal parenchyma.[3] Chronic renal failure is due to a decrease in the glomerular filtration rate caused by a group of diseases such as nephropathy caused by diabetes, high blood pressure, glomerulonephritis, and congenital and hereditary diseases.[4] Kidney cyst disease. Kidney failure is diagnosed by a laboratory examination of kidney functions and sometimes a kidney biopsy.[5] The main problem in patients with chronic renal failure is increased blood acidity with high levels of urea and nitrogenous compounds and clinical uremia syndrome, which is poisoning resulting from excess nitrogen compounds in the blood. Kidney failure is treated by maintaining the internal balance of fluids and ions in the body through dialysis or kidney transplantation.[6,7]

Calcium is one of the important minerals that the body contains in the blood and important tissues, and it has an important role in vital processes such as muscle contraction, nerve impulse conduction, the efficiency of heart muscle work, and blood clotting processes. Calcium constitutes 1.5% to 2% from the body weight. Calcium is concentrated in the bones, which are considered stores for it to be utilized in case of deficiency and the remaining in the blood in order to perform the functions.[8]

Kidney failure is one of the main health problems in Iraq, especially for patients who suffer from diabetes and chronic glomerulonephritis, and it is one of the main and most common causes in patients with high blood pressure and metabolic syndrome.[9] The aim of the study is to study and compare calcium levels in men and women. It includes studying abnormal levels of calcium that cause many diseases, including chronic renal failure, and studying changes associated with renal failure.

EXPERIMENTAL

This study was conducted on patients with chronic renal failure at Murjan Teaching Hospital in Babylon city during the period. The study included a sample of 70 patients (40 males, 30 females) with chronic renal failure, their ages ranged from 30-65, and 60 (30 males, 30 females) healthy without the disease of the same age.

Sampling Method

A 5 ml quantity of venous blood was drawn from each person participating in this study in the morning before breakfast and collected in special tubes containing an anticoagulant to determine the blood changes. Another 5 ml of venous blood was drawn from the same people and collected in tubes free of any anticoagulant materials for biochemical analyzes and after blood clotting, a centrifugal process was performed for 20 minutes at a speed of 300 laps to obtain the blood serum, then the serum was taken to save it until the tests were performed.

Set Hematological Variables

The number of red and white blood cells and platelets was determined in the hematology laboratory of the hospital by using hemocytometer and measuring the hemoglobin concentration according to the method Wong. Determination of hematocrit percentage using capillary tubes containing heparin.[10]

Determination of Biochemical Parameters in the Blood

The measurement of biochemical parameters in the blood serum of people with chronic renal failure and healthy people was set in the biochemical laboratory of the hospital. Where the concentration of glucose in the blood serum was measured using materials from Biacon Company according to the method Trinder[11] that the method depended on GOD- PAP. The determination of protein concentration in serum depending on Biuret method[12] that using Biacon material depending on the absorbance by spectrometer instrument and the determination of albumin concentration by using Biacon material to measurement albumin concentration according to Bromocresol green,[13] then determination of glucose level in serum and determination of triple lipid (triglyceride TG) in serum by using GOD- PAP method according Young and Pestaner,[14] Fossatic and Principe,[15] then determination of cholesterol level in serum by using GOD- PAP method according Richmond[16] then determination of HDL level in serum according Burstein[17] and determination of LDL level in serum by using Friedewald equation[18] and determination of urea concentration by urease[19] and determination of uric acid according to Fossatti method,[20] then determination of creatine concentration without preceptation of protein and determination Na, k, according Maruna& Trinder,[22] determination Ca++ acoording Arsenazo III[23] then determination phosphor (p) according Fiske and Subbarow method.[24]

The measurement of aspartate amino transferase, alanine amino transferase in serum according Reitman S and Frankel[25] and determination of alkaline phosophatase enzyme in serum according to Kind method.[26]

Ethical standard. The study was formally approved the research plan by the ethical committee board at the Babylon health directorate. Informed consent was taken from all the participant patients before being enrolled in the study. All data and materials are available statistical analysis.

The results were expressed as the mean and standard deviation, and the results were statistically analyzed using the computer program Statistical Package for Social Sciences. The differences between the mean values and the standard deviation of people with chronic renal failure and healthy people were compared with the test The level of probability in all statistical tests is significant.

RESULT AND DISCUSSION

After conducting a statistical analysis of hematological and biochemical variables in patients with chronic renal failure, we note the following:

First - Blood Variables

There was a significant significant decrease in the number of red and white blood cells, hemoglobin concentration, hematocrit and platelets in patients with chronic renal failure compared with healthy people, as shown in the *Table* 1.

Function Kidney Test

Significantly significant increases were found in the concentration of urea, uric acid and creatinine, as well as the concentration of calcium and phosphorous ions in the blood serum of patients compared to healthy controls as shown in the *Table* 3. A significant decrease in the concentration of sodium ions was observed in patients with renal failure when compared with healthy controls. There was also a significant decrease in the concentration of calcium ions in the blood serum of patients with renal failure compared with healthy controls.

Table **1.** Comparison of hematological changes in patients with chronic renal failure with those of healthy controls

Variables group	Account of red Blood cell $\times 10^6$ cell/m^3	Hemoglobin Concentration G/100 ml	Hematocrit %	Account of White cell $\times 10^6$ cell/m^3	Account of Plate cell $\times 10^6$ cell/m^3
Healthy group Mean ± SD	0.3±5.4	1.2±12.36	3.9±40.4	0.6±5.8	29.8±299.5
Patient group Mean ± SD	0.27±3.4	1.4±9.4	3.1±30.1	0.3±4.6	21.6±186.4
Percentage %	19.23-	20.82-	19.43-	20.37-	34.75

Table **2.** Showing metabolic changes in patients with renal failure

Variables group	Concentration of Glucose in serum Mg/dl	Concentration of Triglyceride in serum Mg/dl	Concentration of Cholesterol in serum Mg/dl	Concentration of Total protein in serum Mg/dl	Con. of globulin	Concentration of albumin in serum Mg/dl
Healthy group Mean ± SD	7.4±10.8	5.62±13.6	8.6±14.4	0.27±6.57	0.25±2.1	0.31±4.6
Patient group Mean ± SD	11.2±12.6	8.4±14.6	7.2±17.5	0.21±6.8	0.2±3.2	0.25±3.9
Percentage %	40.31+	20.42+	20.12+	12.34+	20.23+	2.44+

Table **3.** Comparison of function kidney changes in patients with chronic renal failure with those of healthy controls

Variables group	Healthy group Mean ± SD	Patient Mean ± SD	Percentage
Concentration of urea (mg/dl)	1.2±16.4	11.5±55.3	221.23+
Concentration of uric acid (mg/dl)	1.1±4.1	4.3±9.8	146.34+
Concentration of creatinine (mg/dl)	0.46±0.92	4.8±14.35	1254.76+
Concentration of sodium (mg/dl)	2.3±14.7	4.5±13.9	5.96-
Concentration of potassium (mg/dl)	0.24±5.7	0.9±9.8	106.23+
Concentration of calcium (mg/dl)	0.2±8.7	0.4±7.6	10.8-
Concentration of phosphor (mg/dl)	0.4±2.88	0.7±6.3	81.36+

Liver Function Test

The result has been showed significant level in enzymes activity for transfer of amine group (alanine amino transferase, aspartate amino transferas) and phosphatase alkaline and also concentration of total bilirubin in patient with compare with healthy in *Table* 4.

It is clear from this study that patients with chronic renal failure are accompanied by a decrease in the number of red blood cells, white blood cells, hemoglobin concentration and hematocrit. This study is consistent with previous studies that have shown that renal failure may lead to a variety of hematological disorders including anemia and leukocyte dysfunction.[27]

Anemia and lack of white blood cells in patients with renal failure may be due to a deficiency in the secretion of the hormone erythropoietin, which is produced by the paraglo-merular system in the kidney, or as a result of a deficiency in iron and folic acid and an increase in the breakdown of red blood cells And other factors, such as the accumulation of nitrogenous compounds and toxic substances that the kidneys cannot excrete in case of failure, which affect the production of red blood cells from the bone marrow and lead to a shortening of the lifespan of red blood cells, and thus blood is excreted in the urine.[28] A significant decrease in the number of platelets was observed in patients with chronic renal failure due to a deficiency in the secretion of erythropoietin, because erythropoietin levels can affect the level of platelets. Because of the symmetry between erythropoietin and thrombin, and the action of ergobutin as a regulator of platelets in the body.[29] It also found a significant decrease in the level of protein and albumin in the blood serum of patients with renal failure, and this study is

Table **4.** Comparison of liver function test changes in patients with chronic renal failure with those of healthy controls

Variables group	Healthy group Mean ± SD	Patient Mean ± SD	Percentage
Activity of alanine amino transferase (U/L)	2.3±20.5	4.5±33.21	65.23+
Activity of aspartate amino transferas (U/L)	2.1±23.7	3.87±30.4	35.6+
Activity of phosphatase alkaline (U/L)	4.26±39.7	45.7±56.25	36.8+
Concentration of total bilirubin (mg/dl)	0.43±1.2	0.38±3.23	34.32+

consistent with the study that was conducted in southern India.[30,31] We found a significant increase in the concentration levels of triglycerides and cholesterol in patients, and this study is consistent with the study that was conducted in India in 2006, 2013.[32] The concentration of urea and creatinine is used as diagnostic tests in the performance of kidney function, where a significant increase in the concentration of urea, creatinine and uric acid was found in patients, and these results are in line with previous studies.[33] It is known that if the level of urea and creatinine increases, this indicates a defect in the work of the kidneys. An inverse proportion has been found between the level of creatinine and blood changes in the blood serum.[34] The kidneys play a key role in regulating sodium and potassium ions in the body. A decrease in the level of sodium and an increase in the level of sodium were found. This study is consistent with another study conducted in Iraq in 2012.[35] The decrease in the concentration of sodium ions may be due to a decrease in the secretion of the hormone aldosterone, and thus the excretion of sodium ions in the urine.

CONCLUSIONS

It has been founded elevation in the concentration of urea, uric acid and creatinine, as well as the concentration of calcium and phosphorous ions in the blood serum of patients compared to healthy controls and its marked change in patient with renal disease.

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