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Study the relationship between some factors and patients with chronic renal failure undergoing the dialysis

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بسم الله الرحمن الرحيم

﴿ وَقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ وَرَسُولُهُ وَالْمُؤْمِنُونَ وَسَتُرَدُّونَ إِلَى عَالِمِ الْغَيْبِ وَالشَّهَادَةِ فَيُنَبِّئُكُمْ بِمَا كُنْتُمْ تَعْمَلُونَ ﴾

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Abstract:

This study aimed to evaluate the relation between some factor and patients with chronic renal failure undergoing dialysis.

This study was conducted in the diwayna hospital from 15/10/2016 to 15/3/2017.

Parameters which were involved in this study included urea, creatinine, hemoglobin, total cholesterol, glucose in patients with chronic renal failure compared with controlled group.

Result recorded significant increase levels of urea, creatinine, total cholesterol, glucose in patients with chronic renal failure compared with controlled group. While there was significant decrease in level of hemoglobin in patients with chronic renal failure compared with controlled group.

Introduction:

Renal failure is a condition in which the kidneys fail to remove metabolic end-products from the blood and regulate the fluid, electrolyte, and pH balance of the extracellular fluids, Renal failure can occur as an acute or a chronic disorder(1).

Acute renal failure is caused by conditions that produce an acute shutdown in renal function, It can result from decreased blood flow to the kidney (prerenal failure), disorders that interfere with the elimination of urine from the kidney (post renal failure), or disorders that disrupt the structures in the kidney (intrinsic or intrarenal failure)(2).

Chronic renal failure represents the end result of conditions that greatly reduce renal function by destroying renal nephrons and producing a marked decrease in the glomerular filtration rate (GFR)(3).

About one in ten people have chronic kidney disease. African Americans, American Indians, Hispanics, and South Asians, particularly those from Pakistan, Sri Lanka, Bangladesh, and India, are at high risk of developing CKD. African Americans are at greater risk due to a prevalence of hypertension among them. As an example, 37% of ESKD cases in African Americans can be attributed to high blood pressure, compared with 19% among Caucasians. People with high blood pressure and diabetes are also at high risk of suffering from CKD than those people without these underlying conditions. About one of five adults with hypertension and one of three adults with diabetes have CKD. Other health conditions that may lead to CKD are obesity, high cholesterol, a family history of the disease, lupus, and other forms of cardiovascular diseases (4).

Signs of renal failure begin to appear as renal function moves from renal insufficiency (GFR 50% to 20% normal), to renal failure (20% to 5% normal), to end-stage renal disease (5).

Abnormalities in lipid metabolism and dyslipidemia are known to contribute to glomerulo-sclerosis and are common in renal disease (6).

In addition, post-transplant dyslipidemias have been associated with an increased risk of ischemic heart disease and have been shown to increase risk of chronic rejection, altered graft function and mortality (7).

The impact of lipid abnormalities on renal function has been evaluated in various studies (8).

In these studies, unfavorable lipoprotein profiles interacted as risk factors for progressive renal decline. Abnormal lipid profiles start to appear soon after renal function begins to deteriorate (9).

Materials and methods:

This study was carried out in educational hospital of al-adiwanya. Period of data collection between (15/10/2016 – 15/3/2017) about six months

This study involved two groups:

1- Patients: Patients number were 30 (20 males, 10 females) with age between (10-80) years and with weight between (50-100) kg.
2- Control: control number were 30 (20 males, 10 females) with age between (10-80) years and with weight between (50-100) kg.

We took information from patients and control such as age, gender, weight, job, physical activity, and smoking.

Parameters:

1- Urea: measured by enzymatic colorimetric method by using kit manufactured by liquicolor (Germany)

2- Creatinine: measured by photometric colorimetric method by using kit manufactured by liquicolor (Germany)

3- Hemoglobin: measured by colorimetric method by using kit manufactured by liquicolor (Germany)

4- Total cholesterol: measured by colorimetric method by using kit manufactured by liquicolor (Germany)

5- Sugar (glucose): measured by enzymatic method by using kit manufactured by liquicolor (Germany)

Result:

This current study showed significant difference between patients with chronic renal failure and healthy persons

Table (1) indicated significant increase in urea, creatine, total cholesterol and glucose compared with controlled group, while significant decrease in hemoglobin compared with controlled group.

parameter	patients	Controlled group
Urea	170.43 ± 43.56*	27.56 ± 3.49
Creatinine	8.68 ± 2.70*	0.96 ± 0.16
hemoglobin	9.08 ± 1.97 *	12.55 ± 1.66
Total cholesterol	195.13 ± 120.22 *	166.70 ± 12.45
Glucose	142.06 ± 66.61 *	93.73 ± 6.90

* refer to significant difference between patients and controlled group

test	T value	P value
urea	17.602	0.0001
creatinine	15.328	0.0001
hemoglobin	7.244	0.0001
cholesterol	1.267	0.21
glucose	3.887	0.001

Discussion:

Several metabolic disorders occur in chronic renal failure

1- Urea and creatinine: Uremia is the condition of having "urea in the blood". Urea is one of the primary components of urine. It can be defined as an excess of amino acid and protein metabolism end products, such as urea and creatinine, in the blood that would be normally excreted in the urine. *The Uremic Syndrome* can be defined as the terminal clinical manifestation of kidney failure (also called renal failure) (10).

2- Hemoglobin: Renal anemia, which is often associated with fatigue and cognitive and sexual dysfunction, has a significant impact on the quality of life of patients with CKF. Anemia has also been identified as an important etiologic factor in the development of left ventricular hypertrophy, an independent risk factor for heart failure and a predictor of mortality in HD patients (11). The major cause of renal anemia in CKF is an inadequate production of the glycoprotein hormone erythropoietin (EPO) because of a reduction in functional kidney parenchyma (12). Furthermore, free radicals elicited from leucocytes by their contact with the dialysis membrane cause hemolysis with consecutive anemia in CKF patients on extracorporeal renal replacement therapy (13).

3- Cholesterol: Chronic renal failure is often associated with dyslipoproteinemia, high levels of cholesterol and triglycerides, as well as a decrease in the polyunsaturated fatty acids. Each of these abnormalities has been identified as an independent risk factor for atherosclerosis (14). Some of them persisting and becoming worse during dialysis treatment (15). Cholesterol is an important component of mammalian cell membranes where it functions in intracellular transport, cell signaling, and maintaining membrane fluidity. Within the blood, cholesterol circulates as both the free acid and as cholesterol esters. Controlling serum cholesterol has an important therapeutic role, as elevated cholesterol levels are associated with the development of atherosclerosis and cardiovascular pathologies. Recent evidence suggests a disturbance of cholesterol homeostasis contributes to the development of a chronic inflammatory state.

4- Glucose: Disorders of carbohydrate metabolism are also very frequent in CKD. Diabetics represent about 35% of all patients on dialysis therapy. Generally, non-diabetic CKD patients often also have glucose intolerance, probably because of peripheral insulin resistance (16). Insulin resistance is primarily detectable when the GFR is below 50 ml/min. Reduced insulin-mediated non-oxidative glucose disposal is the most evident defect of glucose metabolism, but impairments of glucose oxidation, the defective suppression of endogenous glucose production, and abnormal insulin secretion also contribute to uremic glucose intolerance (17).

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