Kidney disease, Ceruloplasmin & Hypertension

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Summary:

The aim of the present study was to estimate the relationship between the urea , creatinine , ceruloplasmin and blood pressure in patient with nephropathy this study include 75 patients with nephropathy collected from Baghdad hospital (30 females and 45males) and 32 sample collected from healthy subject as control group with age range of (40-80 years); patient were divided into three age group (40-50) (51-60) and >60 years. urea , creatinine , ceruloplasmin , blood pressure was determined for both patient and control subject. Results showed that all patient had increased level of urea, creatinin, ceruloplasmin and blood pressure which were statistically significant when compared with control group P< 0.01 the mean urea level in patients (46.5mg/dL) compare with control group (25.5mg/dL) P<0.01 creatinine level in patient were (1.9mg/dL) compare with control group (0.8mg /dL) P<0.01 cerulopasmin .level in patient were (74.8mg/dL) compare with control group (57.2 mg/dL) P<0.01 and blood pressure for patients with nephropathy were (16.1/10.1) mm Hg compare with control group (12.5/8.5) mmHg P<0.01 .

Key words :Kidney disease , ceruloplasmin , Hypertension .

Introduction:

The kidney serve many function in the body in addition of filtering waste from the blood , it regulate the body level of chemicals such as sodium, phosphour and potassium. It also release three hormones : erythropoietin which control the production of red blood cells, Rennin, which regulates blood pressure and the active form of vitamin D which helps maintain calcium for bones and for normal chemical balance in the body **[1].** The major causes of kidney disease in adults are diabetes, hypertension, glomeruloephritis and cystic disease kidney play akey role in keeping a persons blood pressure in healthy range , and blood pressure , in turn , can affect the health of the kidney. High blood pressure also called hypertension can damage the kidney and lead to chronic kidney disease **[2].** Kidney disease is the ninth leading cause of death , diabetes and hypertension are the most common causes of chronic kidney failure .Any diseases that affect the blood vessels , including diabetes , hypertension

and atherosclerosis, can impair ability of this organ to filter blood and regulate fluids in the body, disease and infection in other parts of the body can also trigger a kidney disorder. **[3.4].** Kidney is a vital excretory organ. Accurate assessment of renal function is important in order to detect early derangement though the measurement of glomerulal filtration rate is the gold standard for evaluating kidney function the test procedure is associated with significant practical difficulties, therefore is not routinely qutilized. Quantifying serum markers of renal function is the most commonly used method for estimating renal function despite their intrinsic flaws , urea and creatinine are the most accepted serum markers of renal function **,[5.6].** Acute phase proteins are molecules in the blood that either increase or decrease in response to tissue injury including trauma, heart attack , infection , burns , chronic inflammation and cancer . When the body is injured immune cells flood to the area to help the body heal and or fight off harmful substance (such as bacteria or viruses) .This increase in immune cells leads to inflammation in the body . Acute phase proteins help the body respond to tissue injury[7]. Ceruloplasmin , also called ferroxidase, is copper containing blood protein. It removes iron from cells and preventing iron deposits from building up in the body, if iron collects inside the body's cell it may lead to tissue damage and disease .cerulopasmin increases in response to inflammation, abnormal levels of acute phase proteins in the blood may indicate tissue injury or infection they may also indicate long term immune system disorders. For instance , blood test that measure the levels of acute phase proteins are often used to diagnose and monitor condition like inflammatory disorders , cancer , and auto immune disorders ,autoimmune disorders occur when the body's immune system mistakenly attacks body cells because they are perceived as harmful invaders **[8.9].**

Subjects & Methods:

The study was carried out during the period from October 2009 to October 2010,100 subjects were included in this study , male and female, aged 40- 80 year they were two groups 25 healthy (control) and 75 patients with kidney disease collected from Baghdad hospital fasting morning serum and plasma samples were obtained from each subject, urea, creatinine , ceruloplasmin and blood pressure were analyzed for both subjects. Serum concentrations of urea (enzymatic colorimetric method) was measured as described in kit manufacturer procedure **[10].** Creatinine (kinetic colorimetric method) was measured as described in kit manufacturer **[11].** Ceruloplasmir (singe immunoradio assay) was measured as described **[12].** Blood pressure was measured by sphygmomanometer with cuff **[13].**

Results:

Table (1): Mean and standard deviation values of patients with kidney diseases In comparison with normal population group.

Parameters	Control	Kidney disease patients	P-value
Systolic blood pressure (mmHg)	**12.5±0.2**	**16.1±0.2**	**0.003**
Diastolic blood pressure (mmHg)	**8.5±0.1**	**10.1± 0.2**	**00.03**
Urea(mg/dL)	**25.5±0.2**	**46.6± 0.2**	**0.005**
Creatinine (mg/dL)	**0.8± 0.2**	**1.9± 0,2**	**0.006**
Ceruloplasmin(mg/dL)	**57..2± 0.1**	**74.8± 0.2**	**0.007**

High significant difference between control and patients groups (P<0.01) these results in agreement with that reported by **[4.15].**

Table (2): show mean and standard deviation value of patient with kidney disease

In comparison with normal population group according to age.

Parameter	Age years			
	40-50years Mean + SD Patient Control		51-60 Mean + SD Patient Control	>60 Mean + SD Patient Control
Systolic blood pressure (mmHg)	**Patient 16±0.1 Control 12±0.1**		**16.2±0.2 12.2±0.2**	**16.4±0.2 12.5±0.1**
Diastolic blood pressure (mmHg)	**Patient 9.5±0.2 control 8.2±0.1**		**10.2±0.2 8.4±0.2**	**10.4±0.2 8.5±0.2**
Urea	**Patient 46.3±0.1 Control 25.5± 0.2**		**46.5±0.2 25.8±0.1**	**46.8±0.2 26.2±0.2**
Creatinine	**Patient 1.85±0.1 Control 0.75±0.2**		**1.93±0.1 0.82±0.2**	**1.95 ±0.1 0.85±0.2**
Ceruloplasmin	**Patient 74.2±0.1 Control 56.1±0.1**		**74.82±0.2 56.5±0.1**	**75.2±0.1 57.2 ±0.2**

P value < 0.01 highly significant

Discussion:

Most of the patients were diagnosed with renal disease, therefore serum creatinine and urea were measured. Table 1 and 2 show that there were significantly different when compared with control group. Our results are

similar to the results of the studies done with patients with chronic renal failure **[14.4].** In this study blood pressure and ceruloplasmin were involved , scine ceruloplasmin increased in many disease **[15].** Blood pressures and cerulopasmins were significantly higher in the patients group when compared with control group. High blood pressure makes the heart work harder and, over time, can damage blood vessels throughout the body. If the blood vessels in the kidneys are damaged, they may stop removing wastes and extra fluid from the body. The extra fluid in the blood vessels may then raise pressure even more. It's a dangerous cycle. However, several studies have reported that the blood pressure was increased in renal disease **[2]** Table two reveal the highly significant differences between the patients group and control group ($P<0.001$) . While grouping of the patients according to age , there is no significant differences , this is probably due to the period of having the disease is almost similar .In conclusion , our study provides other parameter to guide clinical decisions in the diagnosis of renal disease beside urea and creatinine measurement. For instance some proteins may help cells destroy harmful substances , such as bacteria , while others may help the blood clot and prevent blood loss, it remains unknown exactly how the acute phase proteins are stimulated. However research suggests that the chemicals released during injury may activate the proteins Among the most common acute phase proteins are ceruloplasmin , Creative protein, fibrinogen , serum albumins , and transferrin , these proteins are continually produced in the liver **[7].** The results, presented in this study indicate that blood pressure, urea, creatinine and ceruloplasmin were statistically highly elevated in kidney disease patients in comparison with control subjects, these result in agreement with what that reported by [4,15]. To keep your kidneys healthy and effectively prevent renal disease, including some of the following healtly lifestyle , eat carefully, drink enough water and don't store up urine in the bladder , always seek professional medical help and avoid drug , self monitoring and health check ups ,disease treatment and control **[16].**

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أمراض الكلى ،السيريلوبلازمين وضغط الدم

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كلية التقنيات الصحيه والطبية **كلية التقنيات الصحيه والطبية**

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الخلاصة :-

يهدف البحث الى ايجادعلاقة بين اليوريا ، الكرياتنين ، السيريلوبلازمين وضغط الدم لدى مرض الكلى . حيث شملت الدراسة 75 مريضا مصابا بالأعتلال الكلوي والمراجعين لمستشفيات بغداد (30 اناث و 45 ذكور) تراوحت اعماهم بين (40–80) سنة و25 اخرون من الاشخاص الاصحاء كمجموعة سيطرة (13 ذكو ر 12 اناث) تمّ تقسيم عينات البحث من حيث العمر الى ثلاث مجاميع (40–50) (51–60) اكثر من 60 سنة). تم اجراء الفحوصات المختبرية لعينات البحث والسيطرة كقياس اليوريا والكرياتنين السيريلوبلازمين ضغط الدم . أظهرت نتائج الدراسة وجود فرق معنوي عالي في قيم المتغيرات الأربعة لدى مرضى الأعتلال الكلوي مقارنة مع الأصحاء ($P<0.01$) حيث كان تركيز اليوريا (46.5 mg/ dL) لعينات المرضى في حين كان (25.5 mg /dL) في مجموعة السيطرة مع وجود فرق معنوي عالي ($P<0.01$) وكان تركيز الكرياتنين(1.9 mg/dl) لعينات المرضى بينما كان تركيزه (0.8 mg / (dL) في مجموعة السيطرة مع وجود فرق معنوي عالي ($P<0.01$) وكان تركيز السيريلوبلازمين (74.8 mg /dL)لعينات المرضى بينما تركيزه (57.2 Mg /dL) في مجموعة السيطرة مع وجود فرق معنوي عالي ($p<0.01$) وكذلك بالنسبة لضغط الدم كان أعلى لدى المرضى (16.1 / 10.1 mmHg) مقارنة مع مجموعة السيطرة (12.5 / 8.5 mmHg) مع فرق معنوي عالي ($P<0.01$)