

## “Serum Creatinine, albumin and urine protein in hypertensive patients.”

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### Abstract:

Some kidney problems are the result of another disease process, such as diabetes or hypertension. Hypertension is a chronic medical condition in which the systemic arterial blood pressure is elevated. this study is conducted to assess the renal functions in patients with hypertension by measuring of serum Creatinine, serum albumin and urine protein . Seventy (37males and 33 females) clinically diagnosed hypertensive patients, under regular visit to the clinical center (Wadnubawy medical health center), were invited to participate in this study as a case. Thirty (30) apparently non hypertensive individuals were also volunteered to participate as control. All subjects were above thirty years of age. Serum Creatinine and serum albumin in hypertensive patients showed significant increase over control Mean SD (141.3 + 39, 52.4 +18) and (50.6 + 7.7, 37.0 + 5.7).Proteinurea was found in hypertensive patients. Hypertensive individuals might be in greater risk of developing renal disease. So reduction of blood pressure is advisable.

### Introduction:

Hypertension is a chronic medical condition in which the systemic arterial blood pressure is elevated (Carretero and Oparil 2000). Long-term regulation of blood pressure predominantly depends upon the kidney. This primarily occurs through maintenance of the extracellular fluid compartment, the size of which depends on the plasma sodium concentration. Although the kidney cannot directly sense blood pressure, changes in the delivery of sodium and chloride to the distal part of the nephron alter the kidney's secretion of the enzyme renin (Kenneth and Saladin 2009).

This results in high blood pressure. (Narisa Futrakul and Prasit Futrakul2009& Robertson1987)) Some kidney problems are the result of another disease process, such as diabetes or hypertension (Brenner, *et al.*, 1999). Creatinine, a by-product of muscle energy metabolism that, similar to urea, is filtered from the blood by the kidneys and excreted into the urine (Henry, 2001). Elevation of blood creatinine is a more sensitive indicator of impaired kidney (Pagana and Kathleen 1998). Measurement of the blood levels of other elements regulated in part by the kidneys can also be useful in evaluating kidney function. These include sodium, potassium, chloride, bicarbonate, calcium, magnesium, phosphorus, protein, uric acid, and glucose (Giri, 2004).

Healthy kidneys filter all proteins from the bloodstream and then reabsorb them, allowing no protein, or only slight amounts of protein, into the urine. The persistent

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presence of significant amounts of protein in the urine is an important indicator of kidney disease. A positive screening test for protein (included in a routine urinalysis) on a random urine sample is usually followed up with a test on a 24-hour urine sample that more precisely measures the quantity of protein (Glodny, *et al.*, 2009).

Many conditions can affect the ability of the kidneys to carry out their vital functions. So this study is conducted to assess the renal functions in patients with hypertension by measuring of serum Creatinine, serum albumin and urine protein

### **Material and methods:**

#### **Study area**

Wadnubawy city is located in Omdurman province which lies on the left hand of the river Nile. Its population about 1000000. Most of them works sedentary occupation at the government or at Private Corporations.

#### **Sampling :**

Seventy (37 males and 33 females) clinically diagnosed hypertensive patients, under regular visit to the clinical center, were invited to participate in this study as a case. Thirty (30) apparently non hypertensive individuals were also volunteered to participate as control. All subjects were above thirty years of age. Data collection was conducted during Feb-Mar 2012.

#### **Blood samples :**

Serum separated by centrifuging blood for 10 minutes at 3000RPM. Then, decanted into 5ml plain plastic tube, labeled with date, name, time of collection, identification number of the volunteer

participating in this study and stored frozen at  $-4^{\circ}\text{C}$  for biochemical analysis.

All biochemical tests were done by the researchers and were carried at Wadnubawy medical health center. Quality assurance was conducted in Mohamed Mokhtar private lab and some samples were duplicated.

Determination of Serum Creatinine and, albumin were obtained by using analysis kit (Crescent Chemicals Company) and Corning colorimeter model 252. While, proteinuria was detected by precipitating albumin with sulphosalicylic acid (Paul, *et al.*, 2006).

#### **Data Analysis:**

The data was analyzed using Statistical Package for Social Sciences (SPSS), Windows version 8x, 1997 SPSS, Inc, Chicago, IL, and USA.

Percentage was calculated, T -test and chi tests were also used.

#### **Results :**

At  $P < (0.0001)$  serum creatinine and albumin is elevated in hypertensive patients. In addition to there was significant difference in presence of proteinuria among hypertensive participants compared to those with normotensive participants.

#### **Discussion :**

Elevated serum creatinine and protein, in addition to presence of protein in urea might be to direct effect of hypertension and its related complications on renal function. Creatinine test also provide a base line measurement of kidney function that can be used as monitoring for side effects of certain antihypertensive drugs on kidney function. Similarly testing of urine samples for protein can be used as a secondary indicator of kidney disease.

**Table1. Mean Serum Creatinine and Albumin in hypertensive and control participants**

Biochemical parameter	Hypertensive participants Mean±SD	Normotensive participants Mean±SD	Significance
Creatinine (µmol/L)	141.3 ± 39	52.4 ± 18	*
Albumin (g/L)	50.6 ± 7.7	37.0 ± 5.7	*

**Table2. Chi test and percentage of Proteinuria in hypertensive and normal blood pressure participants.**

Category	Hypertensive participants	Normotensive participants	Significance
Detected Proteinuria	42.85%	6.66%	*
Not detected proteinuria	57.15%	93.44%	*

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