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Research Article

**RELATION OF SERUM URIC ACID WITH SERUM  
CREATININE AND BLOOD UREA**<sup>1</sup>Rafiullah, <sup>2</sup>Dr. Samreen Bugti, <sup>3</sup>Dr. Mehwish Irshad<sup>1</sup>Quetta Institute of Medical Sciences<sup>2</sup>Bolan Medical University<sup>3</sup>MBBS, Services Hospital Lahore**Abstract:**

*Hyperuricemia is the leading cause of major health issues, including renal failure. Hyperuricemia is linked with many diseases such as diabetes mellitus, hypertension, obesity and hypertriglyceridemia.*

*Objective: The aim of this study was to know Uric Acid Association with Serum Creatinine and Blood Urea.*

*Study Design: A Cross-Sectional Study.*

*Place and Duration: In the Outpatient Department of Medicine Unit II of Nishter Hospital Multan and for analysis patients were referred to Physiology Department of Nishter Medical University, Multan. The study continues for One year period from July 2016 to June 2017.*

*Methods: More than 39 mg / dl blood urea and more than 1.4 mg / dl serum creatinine over 80 years of age individuals were included. 53.01% of the cases were male. Volunteers were selected as a control group corresponding to sex and age with the study group with normal serum creatinine and blood urea.*

*Results: In 33 patients Serum uric acid was elevated. The serum uric acid mean value was  $7.01 \pm 2.019$  ( $p < 0.04$ ) in men and  $4.954 \pm 2.410$  in women ( $p < 0.04$ ).*

*Conclusion: In patients Serum uric acid was high with renal insufficiency ( $p < 0.05$ ). Raised serum uric acid levels were not associated significantly with the renal disease.*

**Key words:** *Blood urea, serum uric acid, serum creatinine.*

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**INTRODUCTION:**

In humans the final product of purine metabolism is Uric acid. In humans, the main nucleosides of adenosine, guanosine and purine convert into uric acid. The serum uric acid normal value ranges from 2.5-7.3 mg / dL (140-441  $\mu$ mol / L) in men and 1.5-5.7 mg / dL in women (80-350 Molmol / L). Excess uric acid production produces gout. It also causes renal failure. Hyperuricemia is also linked with diabetes mellitus, hypertension, obesity and hypertriglyceridemia. Uric acid Overproduction and hyperuricemia may also cause rapidly development of renal failure. Patients with less severe but longer hyperuricemia tend to have a more chronic tubulointerstitial disorder, often referred to as gout nephropathy. Other complications linked with hyperuricemia, such as nephrolithiasis, hypertension, lead poisoning and pyelonephritis may contribute to renal injury, so that on renal function the impact of chronic hyperuricemia is not clear. However, the renal involvement severity is associated with the duration and magnitude of elevated serum uric acid levels of this disorder. Hyperuricemia leading to hyperuric acid may also lead to an high frequency of nephrolithiasis. Glomerular filtration rate is the best measure of functional renal mass and functional nephrons. Precise accuracy of the glomerular filtration rate is expensive and time consuming, but several filtered substances can be calculated to

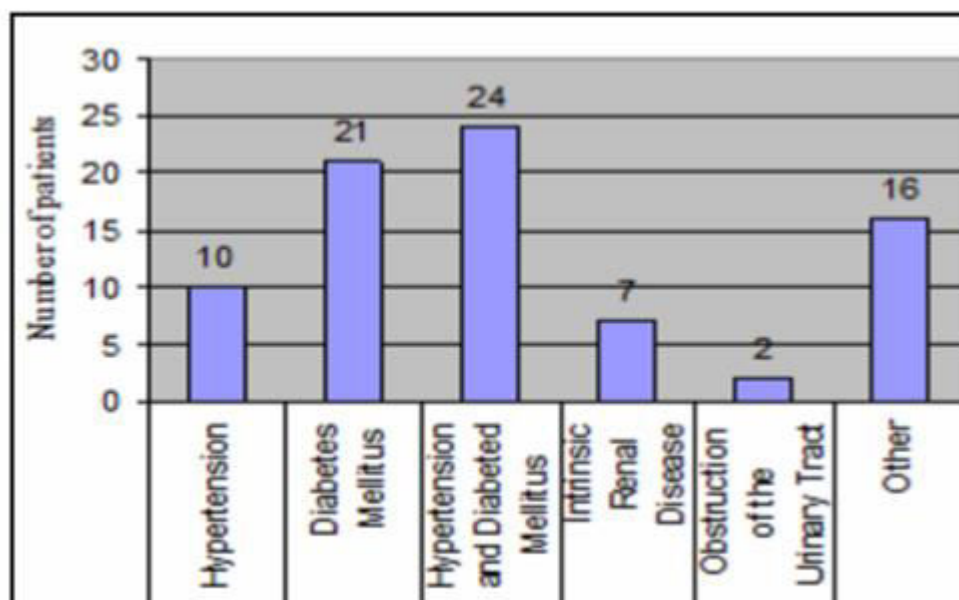
determine the glomerular filtration rate, including serum creatinine and blood urea. The aim of this analysis was to investigate serum urea and serum creatinine and blood urea.

**MATERIALS AND METHODS:**

This cross sectional study was held in the Outpatient Department of Medicine Unit II of Nishter Hospital Multan and for analysis patients were referred to Physiology Department of Nishter Medical University, Multan. The study continues for One year period from July 2016 to June 2017. 80 patients were selected from the outpatient department. All patients were over 41 years old. 43 (53.05%) of the cases were male and 37 (46.95%) were female. All volunteers had high blood urea above 41 mg / dl. Serum creatinine is greater than 1.4 mg / dl in male subjects and in female subjects greater than 1.1 mg / dl. The abnormal renal function etiology was also observed. 80 volunteers were included as control group. In the control group, all volunteers were over 41 years old; male were 43 (53.05%) and 37 (46.95%) were female. In the control group, serum creatinine Blood ureas were normal.

**RESULTS:**

In Figure 1, the etiology of abnormal renal function is given.



**Figure-1: Causes of Abnormal Renal Function**

In 34 patients, Serum uric acid was increased. The mean value of serum uric acid was  $7.01 \pm 2.091$  ( $p < 0.05$ ) in males and  $4.094 \pm 2.214$  in females ( $p < 0.04$ ).

**Table-1: Serum Uric Acid levels in study group and control group**

Disease	Males (42)	Females (38)	All Patients (80)
Hypertension (10)	6.953±1.756	5.692±1.632	6.165±1.693
Diabetes Mellitus (21)	7.012±1.906	5.726±1.706	6.452±1.832
Hypertension and Diabetes Mellitus (24)	7.101±2.301	5.760±1.089	6.402±1.503
Intrinsic Renal Disease (7)	5.623±1.725	4.935±0.985	5.325±1.423
Obstruction of the Urinary Tract (2)	5.324±1.502	4.534±0.823	4.852±1.326
Other (15)	5.512±1.632	4.561±0.798	4.728±1.136
Total (80)	6.213±2.025	4.956±1.125	5.861±1.132
Control Group	5.361±1.685	3.902±1.012	4.526±1.308

The results are summarized in Tables 1 and 2.

**Table-2: Number of subjects with increased Serum Uric Acid**

Disease	Males (42)	Females (38)	All Patients (80)
Hypertension (10)	2	1	3
Diabetes Mellitus (21)	6	3	9
Hypertension and Diabetes Mellitus (24)	7	4	11
Intrinsic Renal Disease (7)	2	1	3
Obstruction of the Urinary Tract (2)	0	1	1
Other (15)	4	2	6
Total (80)	21	12	33
Control Group	1	0	1

### DISCUSSION:

In Table 1 and 2 of Figure 1, it can be seen that serum uric acid increases in patients with renal insufficiency ( $p < 0.04$ ). The rise in serum uric acid levels was not significantly associated with the cause of kidney disease. Hyperuricemia is common in men in elderly patients. Associated diseases and renal failure are often found. Hyperuricemia is frequently associated with hypertriglyceridemia, obesity, coronary artery disease, hypertension and diabetes mellitus. Serum uric acid is an independent risk factor for the progression and development of coronary artery disease. Hyperuricemia is known to cause acute renal failure due to the accumulation of intrarenal crystals. However, recent analysis shows that mild hyperuricemia may have proinflammatory and vasoactive effects independent of crystal

formation. Hyperuricemia is linked with Renal issues, but is generally marked as a renal dysfunction marker, rather than a progression risk factor. Recent analysis have shown that mild hyperemesis is induced by oxonic acid (OA) caused by intrarenal vascular disease kidney damage and hypertension in normal rats. This led to the hypothesis that uric acid may be a real tool for kidney disease and progression. Male sex, regardless of blood pressure, is associated with higher rates of kidney disease, dietary protein intake or serum lipid levels. Although hyperuricemia is associated with long-term kidney disease, uric acid has is considered as a true tool for the kidney disease progression. The observation that hyperuricemia is linked with other risk factors especially for kidney diseases and cardiovascular diseases such as hypertension causes problems to decrease the uric

acid effects. However, recent epidemiological evidence suggests that there is an independent and significant relationship between a low uric acid levels and the beneficial effect of decreasing uric acid levels in the progression of kidney disease. Recent data show that hyperuricemia and one of the major mechanisms of progressive kidney disease, previously unknown, is to activate the cyclooxygenase-2 (COX-2) and renin-angiotensin system. However, these analysis provide a mechanism to explain epidemiological evidence that uric acid is an independent risk factor for renal progression, but be cautious when interpreting animal models for human diseases. Although there is no concrete evidence that uric acid is a reversible relationship with progressive or progressive kidney disease in humans, it is important to check that hyperuricemia plays an important role in the progression of kidney disease. Find a safe and reasonable time for therapy. The modalities in each patient are based on clinical data, drug history and the presence of cardiovascular complications. Hyperuricemia is usually associated with traditional risk factors such as dyslipidemia, hypertension abnormalities and glucose metabolism. Recent experimental findings have highlighted the possible role of uric acid in the vascular disease and hypertension pathogenesis. Biochemical and in vitro data proved that antioxidants are usually insoluble crystalline uric acid that can increase the lipid oxidation of radicals and have various pro-oxidant effects in vascular cells.

### CONCLUSION:

In vivo and vitro findings suppose that endothelial injury effects cause high uric acid and impaired nitric oxide production and may contribute to endothelial dysfunction. Vascular smooth muscle cells (VSMC) are described in soluble uric acid and are associated with proliferative pro-inflammatory effects, mild hyperuricemia, animal models, intrarenal vascular disease, high blood pressure. Possible side effects of vascular uric acid are associated with increased expression of chemokines and cytokines, stimulation of the renin-angiotensin system, and increased expression of reactive protein in vascular protein C (CRP). Experimental evidence is seen in the complex, but it is potentially viable for uric acid in the causative role of hypertension and the pathogenesis of atherosclerosis.

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