



RENAL PROFILE IN PATIENTS WITH CHRONIC KIDNEY FAILURE PRE AND POST-DIALYSIS.

Biochemistry

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ABSTRACT

Aim & Objectives: The aim of this study is evaluating and correlating the values of various biochemical markers like urea, creatinine, and electrolytes in blood from pre and post-dialysis samples of renal failure patients and to evaluate the effects of dialysis on them. **Materials And Methods:** In this study, 30 CKD patients on hemodialysis were included. **Results:** In the present study There is a highly statistically significant difference in means of Serum Urea, Creatinine and Potassium ($P < 0.001$). There is a statistically significant difference in means of Serum Sodium, ($P < 0.05$). **Conclusion:** A firm imbalance in blood parameters was perceived among renal failure patients. Hemodialysis forms an efficient and indispensable process to decrease the burden on kidneys.

KEYWORDS

CKD, eGFR, PTH, Ca etc.

INTRODUCTION

Renal failure refers to a condition where the kidneys lose their normal functionality, which may be due to various factors including infections, autoimmune diseases, diabetes and other endocrine disorders, cancer, and toxic chemicals. It is characterized by the reduction in the excretory and regulatory functions of the kidney; it is the ninth leading cause of death in the United States as well as most industrialized nations throughout the world [1,2]

The progression of kidney damage is marked by the rise in two important chemical substances in the blood - creatinine, and urea whose evaluation in the serum helps to assess the Glomerular Filtration Rate (GFR) followed by renal function. However, neither creatinine nor urea is directly toxic and they are only a measure of kidney function [3]. Creatinine is produced from muscles and is excreted through the kidneys along with other waste products. Creatinine concentration in serum is maintained by the balance between its generation and excretion by the kidneys. It has been estimated that 2% of the body's creatine is converted into creatinine every day, resulting in the daily generation of creatinine at a fairly constant rate. [4] Males have higher serum creatinine levels than females because males have greater muscle mass. The quantity of creatinine in serum depends on their generation, glomerular filtration, and tubular secretion of serum creatinine. Calculations based on serum creatinine and the age groups of the patient are used to estimate more precisely the degree of kidney function [5,6].

The most common type of dialysis used is Hemodialysis. In Hemodialysis blood is pumped out of the patient's body and goes through a dialyzer (an artificial kidney). Hemodialysis is done three to four times a week. Each session lasts for at least 3 to 4 hours [7]. Even though there is a dramatic improvement in dialysis technology and pharmacological treatment, mortality rates for dialysis patients are still high. In India, within a year approximately 9-13% of hemodialysis patients die [8]. There are many biochemical parameters for the detection of kidney failure, the most reliable and sensitive markers are serum creatinine and urea [9]. Progression of kidney damage is detected with the rise of these two chemical substances in the blood, which assesses renal function. Urea and creatinine are not toxic but are helpful to measure renal function. Creatinine is produced from muscles and is excreted through the kidneys along with other waste products [7]. Urea is an organic compound and has an important role in the metabolism of nitrogen-containing compounds. Urea is the metabolized product of dietary proteins, the waste product filtered through the kidney into the urine [10].

The present study was focused on evaluating and correlating the values of various biochemical markers like urea, creatinine, and electrolytes in blood from pre and post-dialysis samples of renal failure patients and evaluating the effects of dialysis on them.

MATERIAL AND METHODS

The study was done at the Department of Biochemistry, Prakash Institute of Medical Science and Research, Urun-Islampur. Data were collected from medical records of the dialysis unit.

MEAN AGE GROUP - 20 - 60 yrs.

DISTRIBUTION OF STUDY SUBJECTS:

Group I	N = 30 CKD patients before dialysis.
Group II	N= 30 CKD patients after dialysis.

Inclusion Criteria:

CKD patients diagnosed by nephrologists who were on dialysis.

Exclusion Criteria:

1. Those case records which did not have the relevant data or incomplete data.
2. Pregnant and lactating women.
3. Diabetic patients.
4. Liver diseases.

RESULTS

Table No. 1: The Mean Value Of Means Of Serum Urea, Creatinine, Sodium, And Potassium In Pre And Post-dialysis CKD Patients.

Name Of the Parameters	CKD Patients pre Dialysis (N=30)		CKD Patients post Dialysis (N=30)		Significance
	Mean $\pm$ SD	Std. Error of Mean	Mean $\pm$ SD	Std. Error of Mean	
UREA	149.9 $\pm$ 13.8 ***	2.53	48.3 $\pm$ 8.44	1.54	P < 0.001
Creatinine	6.7 $\pm$ 0.85 ***	0.15	2.83 $\pm$ 1.35	0.24	P = < 0.001
Sodium	137.9 $\pm$ 13.2 **	2.41	135.1 $\pm$ 17.1	3.12	P < 0.05
Potassium	5.98 $\pm$ 0.44 ***	0.08	3.30 $\pm$ 1.19	0.21	P < 0.001

The statistical method used to compare data was an unpaired 't' test

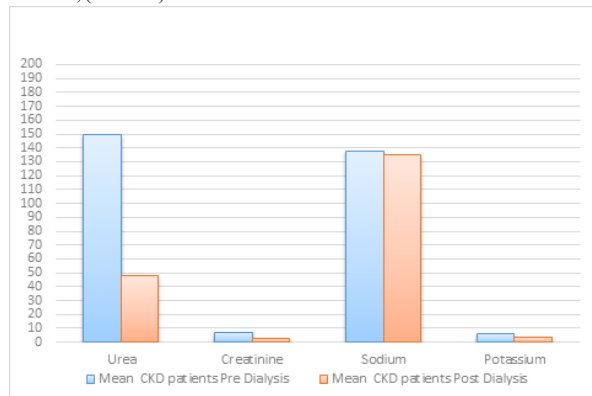
* $P > 0.05$Not Significant

** $P < 0.05$Significant

*** $P < 0.001$Highly Significant

There is a highly statistically significant difference in means of Serum Urea, Creatinine, Sodium, and Potassium ($P < 0.001$).

There is a statistically significant difference in means of Serum Sodium, ($P < 0.05$).



Graph No.1: Comparison Of Biochemical Parameters In CKD Patients With Pre-dialysis And Post-dialysis.

DISCUSSION

Kidney failure is a very slow-advancing disorder with irretrievable slaughtering of the nephrons. As the normal filtration capacity of the renal system is compromised, the blood Urea and Creatinine disposal is affected and hence, a drastic increase before dialysis is observed. In our recent findings, the blood urea and blood creatinine levels were radically elevated of dialysis patients. On the other hand, in comparison to pre and post-dialysis blood parameters Urea and Creatinine were observed to be considerably lower after dialysis. These findings were concordant with the previous finding of Singh et al., in 2016. Singh enlightens the concept of renal loss due to depressed renal glomerular filtration, piloting towards the accumulation of various metabolites like Urea, Creatinine, and other elements in blood and ending with permanent destruction of nephrons. Nisha et al 2017 reconfirmed that in renal failure, although the boost in serum urea levels is seen to be relative to the disease progression, the protein catabolism products in such patients cannot be ignored. Also our findings of higher blood urea & and creatinine before dialysis and their drastic reduction after dialysis were also at par with the findings of Mohammed Jumaah, in 2013. Our result is visibly indicative of the removal of Creatinine and Urea from blood after dialysis as compared to the status before dialysis.

CONCLUSION

A firm relationship is observed between serum creatinine and serum urea levels among renal failure patients. hemodialysis forms an effective process as an efficient and indispensable process for the filtration of undesired metabolites such as creatinine and urea and potassium at a considerable range, hence decreasing the burden on kidneys.

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