

**ORIGINAL ARTICLE**

**Comparative study of serum electrolytes ( Na<sup>+</sup>, K<sup>+</sup>) in patients of different stages of chronic kidney disease (CKD)**

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**ABSTRACT**

**BACKGROUND:** A cross sectional study with 100 patients of chronic kidney disease was done to compare electrolytes (Na<sup>+</sup>, K<sup>+</sup>) level among different stages of chronic kidney disease at clinical chemistry laboratory, S.S.G. hospital Baroda. CKD patients were divided in three different groups according to serum creatinine values. Electrolyte values were compared with student t-test and p values among these three different groups of CKD patients statistically. P value for sodium between group-1 and group-2, group-2 and group-3, group-3 and group-1 are 0.68, 0.53 and 0.80 respectively. P value for potassium between group-1 and group-2, group-2 and group-3, group-3 and group-1 are 0.46, 0.77 and 0.29 respectively. So all p values were found >0.05 and suggest that difference of electrolytes among different stages of CKD is not significant. It may be due to variably high or low level of changes for electrolytes in different stages of CKD patients.

**Key words:** CKD, Na<sup>+</sup> and K<sup>+</sup>, S. Creatinine, staging of CKD.

**INTRODUCTION**

Chronic kidney disease is associated with water and electrolytes specially sodium and potassium imbalance in body. This imbalance can be life threatening and so it is important to establish severity of this imbalance among different stages of chronic kidney diseases.<sup>2</sup> The major causes of CRF include chronic glomerulonephritis, progressive nephrotic syndrome, diabetes mellitus, chronic hypertension, long standing polycystic kidney and chronic pyelonephritis.<sup>1</sup> Disturbances in water, electrolyte and acid base balance contribute to the clinical picture in CRF. In recent years, diabetes mellitus and hypertension have become recognized as the leading cause of End stage renal disease (ESRD), together accounting for more than 70 percent of all chronic renal failure.<sup>1</sup>

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**AIM & OBJECTIVES**

- To classify the patients of CKD in 3 groups on the basis of S. creatinine.
- To study the S. Electrolytes in this patients.
- To compare S. electrolytes in different groups of CKD patients.

**MATERIALS AND METHODS**

Cross sectional Study of 100 patients of CKD was undertaken in clinical chemistry laboratory in S.S.G. hospital. S. Creatinine was measured by Jaffe’s method on Roche Cobas C-311 autoanalyzer & S. Electrolytes on Easylyte plus analyzer & patients were classified in 3 groups.

Group – 1 :- Decrease Renal Reserve (S. Creatinine :- 1.0-2.5) (n-35)

Group – 2 :- Renal insufficiency (S. Creatinine :- 2.5-6.0) (n-35)

Group – 3 :- Renal Failure & End stage renal disease (S. Creatinine >6.0) (n-30)

INCLUSION CRITERIA	EXCLUSION CRITERIA
Chronic kidney disease patients	Patients on hemodialysis
Males	Females
	Muscular dystrophies
	Children
	Disease of adrenal glands
	Acute kidney disease patients

**STATISTICAL ANALYSIS**

It was done using ‘student t’ test. Results expressed as mean & SD. Comparison of variables between 3 groups performed

with student t test & p value found to be >0.05 & is considered as not statistically significant. All analysis were done using Medcalc software.

**OBSERVATIONS**

**Demographic profile**

**Table 1: Mean Age and SD**

	Group I	Group II	Group III	P value
No of cases	35	35	30	P>0.05
Mean Age±SD	55±2.6	58±2.4	56±2.1	
Sex	Male	Male	Male	

All patients were males. Table 1 show there is no stastically significant difference in the mean age and SD between three groups. This study was age and sex matched.

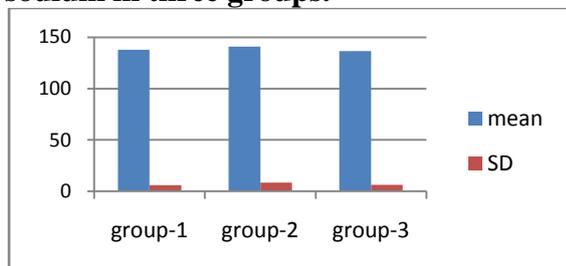
**Table 2: Mean & SD of serum electrolytes in three groups.**

GROUP	SODIUM		POTTASIUM	
	MEAN (mEq/L)	SD	MEAN (mEq/L)	SD
1	137.77	5.88	4.73	0.81
2	141.06	8.54	5.02	1.23
3	136.68	6.20	5.24	1.27

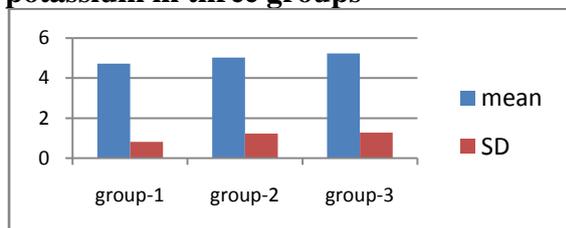
Table 2 show the mean and SD of serum electrolytes.

P value between group 1 & 2, 2 & 3 and 1 & 3 for sodium are 0.68, 0.53 and 0.80 respectively. Same for potassium are 0.46, 0.77 and 0.29 respectively

**Figure 1: showing the levels of serum sodium in three groups.**



**Figure 2: showing the levels of serum potassium in three groups**



**DISCUSSION**

Cross sectional Study of 100 patients of CKD was undertaken in clinical chemistry laboratory in S.S.G. hospital. Both the

groups are age and sex matched. All the statistical analysis was done using Medcalc software. Results of electrolytes don't show any statistically significant difference in all the groups. While literatures search I couldn't find an article similar to our study. There is no statistically significant difference in the serum electrolytes level in all groups probably because of less number of sample size in each groups.

**CONCLUSION**

In our study p value for comparison among group is >0.05, so difference in Serum electrolytes in 3 different group of patients of chronic kidney disease is not significant statistically.

No significance is seen as S. electrolytes (Na<sup>+</sup>, K<sup>+</sup>) values can vary from abnormal high to abnormal low in CKD irrespective of the stage of the patient.

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