

## Original Research

### Assessment of C Reactive Protein in pre and post dialysis patients of Chronic Kidney Disease with Diabetes and Hypertension

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#### ABSTRACT:

**Background:** Dialysis is an artificial replacement of kidney function, done especially in renal failure cases. C-reactive protein was so named because it was first identified as a substance in the serum of patients with acute inflammation which reacted with the somatic 'C' carbohydrate antigen of Pneumococcus. Hence; under the light of above obtained data, we planned the present study to assess C reactive protein as an inflammatory marker in pre and post dialysis patients of chronic kidney disease with diabetes and hypertension. **Materials & methods:** A total of 50 patients were enrolled. The patients were subjected to detailed history and clinical examination and other investigations. Information regarding age and sex distribution, clinical diagnosis was collected. Patients with more than 40 years of age with stage 5 chronic kidney disease to undergo dialysis for the first time and with presence of both Diabetes and Hypertension were included. All patients underwent complete clinical examination of blood pressure, pulse rate and systemic examination. Biochemical testing was done. C-reactive protein was measured using autoanalyzer. **Results:** Mean C reactive proteins levels among the pre-dialysis patients and post-dialysis patients was 3.05 mg/L and 3.56 mg/L respectively. Significant results were obtained while comparing the mean C Reactive proteins among pre-dialysis and post-dialysis patients. **Conclusion:** Chronic inflammation seems to permeate the hypertensive diabetic renal disease, thus more objectively contributing to the renal arteriolar degenerative process.

**Key words:** C reactive proteins, Renal, Dialysis.

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#### INTRODUCTION

Dialysis is an artificial replacement of kidney function, done especially in renal failure cases. It cannot completely perform lost kidney function, but manages its activities by means of diffusion and ultrafiltration. Dialysis is performed in Chronic Kidney Disease patients to remove accumulated toxins from the body. C-reactive protein is an annular pentameric protein found in plasma, the level of which rises in response to inflammation. It is an acute-phase protein of hepatic origin that increases following interleukin-6 secretion by macrophages and T cells. C-reactive protein was so named because it was first identified as a substance in the serum of patients with acute inflammation which

reacted with the somatic 'C' carbohydrate antigen of Pneumococcus.<sup>1-3</sup>

The acute-phase response is a major pathophysiologic phenomenon that accompanies inflammation. These responses presumably contribute to defensive or adaptive capabilities. Acute-phase proteins are defined as those proteins, whose plasma concentration increase (positive acute-phase proteins), such as C-reactive protein, or decrease (negative acute-phase proteins), such as albumin, during inflammatory states. Measurement of the levels of these proteins is frequently utilized to define the presence of inflammation in a given patient.<sup>4-6</sup> Hence; under the light of above obtained data, we planned the present

study to assess C reactive protein as an inflammatory marker in pre and post dialysis patients of chronic kidney disease with diabetes and hypertension.

### MATERIALS & METHODS

The present study was undertaken in the department of general medicine with the aim of assessing C reactive protein in pre and post dialysis patients of chronic kidney disease with diabetes and hypertension. Written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 patients were enrolled. The patients were subjected to detailed history and clinical examination and other investigations. Information regarding age and sex distribution, clinical diagnosis was collected. Patients with more than 40 years of age with stage 5 chronic kidney disease to undergo dialysis for the first time and with presence of both Diabetes and

Hypertension were included. All patients underwent complete clinical examination of blood pressure, pulse rate and systemic examination. Biochemical testing was done. C-reactive protein was measured using autoanalyzer. All the results were recorded and analyzed by SPSS software.

### RESULTS

Mean age of the patients was 54.5 years. 56 percent of the patients were males while the remaining were females. Mean S Bilirubin value was 0.84 mg/dL. Mean SGOT and SGPT was found to be 32.66 mg/dL and 23.45 mg/dL respectively. Mean C reactive proteins levels among the pre-dialysis patients and post-dialysis patients was 3.05 mg/L and 3.56 mg/L respectively. Significant results were obtained while comparing the mean C Reactive proteins among pre-dialysis and post-dialysis patients.

Table 1: Mean age of the patients of the present study

Parameter	Value
Mean age (years)	54.5
SD	7.56

Table 2: Distribution of subjects according to gender

Gender	Number of subjects	Percentage
Males	28	56
Females	22	44

Table 4: Descriptive results

Parameter	Mean	SD
S. Bilirubin (mg/dL)	0.84	0.15
SGOT (mg/dL)	32.66	5.5
SGPT (mg/dL)	23.45	6.21

Table 5: Comparison of CRP pre-dialysis and post-dialysis

Parameter	Pre-dialysis	Post-dialysis	p- value
Mean CRP (mg/L)	3.05	3.56	0.01 (Significant)
SD (mg/L)	0.46	0.42	

### DISCUSSION

CKD in primary care is commonly asymptomatic, and the exact pathology underlying its development is often unknown (as no renal biopsy is usually performed). It is identified and defined by the presence of an abnormality of kidney structure or function (or both) present for at least 3 months. Key to the definition of CKD is the need to assess these markers of renal function over time in order to confirm chronicity.<sup>7-9</sup> Hence; under the light of above obtained data, we planned the present study to assess C reactive protein as an inflammatory marker in pre and post dialysis patients of chronic kidney disease with diabetes and hypertension.

In the present study, mean age of the patients was 54.5 years. 56 percent of the patients were males while the remaining were females. Mean S Bilirubin value was 0.84 mg/dL. Mean SGOT and SGPT was found to be 32.66 mg/dL and 23.45 mg/dL respectively. In a previous study conducted by Tung CW et al, authors examined the relationship between Adiponectin (ADPN) and longitudinal high-sensitivity C-reactive protein (hs-CRP) changes and investigated whether ADPN or hs-CRP levels could predict cardiovascular (CV) outcomes and mortality in prevalent peritoneal dialysis (PD) patients after comprehensive adjustment of possible confounders. 78 PD patients were enrolled and followed. During follow-up, CV events and all-cause mortality were recorded. hs-CRP was identified

as independent predictor of all-cause mortality. Serum hs-CRP levels were consistently lower in the high ADPN group during 2-year follow-up. They also demonstrated the importance of ADPN and hs-CRP in predicting CV events and all-cause mortality in PD population during 3.5-year follow-up.<sup>10</sup> Iseki K et al, in another study, determined of the relationship between CRP and serum albumin concentration, and the value of baseline CRP data in the prediction of death. In one of the dialysis units in Okinawa, Japan, baseline CRP data was available. These patients were divided into two groups according to their baseline CRP levels, with group 1 consisting of CRP<10 mg/l (n=128) and group 2 of CRP≥10 mg/l (n=35), and then followed up. CRP was a significant predictor of death in chronic dialysis patients, independent of serum albumin and other possible confounders.<sup>11</sup>

In the present study, Mean C reactive proteins levels among the pre-dialysis patients and post-dialysis patients was 3.05 mg/L and 3.56 mg/L respectively. Significant results were obtained while comparing the mean C Reactive proteins among pre-dialysis and post-dialysis patients. In a previous study conducted by Lee BT et al, authors studied the association of inflammatory biomarkers including C-reactive protein (CRP), tumor necrosis factor-alpha (TNF-α), and interleukin-6 (IL-6) with chronic kidney disease (CKD). Their data suggested that TNF-α and IL-6, but not CRP, are associated with the prevalence and severity of CKD, independent from established CKD risk factors, history of cardiovascular disease, and use of antihypertensive, antidiabetic, and lipid-lowering agents and aspirin.<sup>12</sup> Adejumo OA et al determined serum CRP levels in CKD patients and associated factors. 80 consecutive CKD patients and 40 control subjects without CKD were assessed. Serum CRP levels, albumin, creatinine and lipid profile were determined. Elevated serum CRP was significantly predicted by low eGFR and high BMI on multivariate analysis. Chronic kidney disease patients have increased cardiovascular event risk.<sup>13</sup>

## CONCLUSION

The high concentration of C Reactive protein in post-dialysis patients shows that the elements of a chronic inflammation seem to permeate the hypertensive diabetic renal disease, thus more objectively contributing to the renal arteriolar degenerative process.

## REFERENCES

1. Levey AS, Coresh J, Balk E, Kausz AT, Levin A, Steffes MW, et al. National Kidney Foundation practice guidelines for chronic kidney disease: evaluation, classification, and stratification. *Ann Intern Med.* 2003;139(2):137-47.
2. Abraham G, Sundaram V, Sundaram V, Mathew M, Leslie N, Sathiah V. C-Reactive protein, a valuable

- predictive marker in chronic kidney disease. *Saudi Journal of Kidney Diseases and Transplantation.* 2009 Sep 1;20(5):811.
3. Noh H, Lee SW, Kang SW. Serum C-reactive protein: a predictor of mortality in continuous ambulatory peritoneal dialysis patients. *Perit Dial Int* 1998; 18:387.
4. Kalantar-Zadeh K. Recent advances in understanding the malnutrition-inflammation-cachexia syndrome in chronic kidney disease patients: What is next? *Semin Dial* 2005; 18:365.
5. Fox ER, Benjamin EJ, Sarpong DF, Nagarajarao H, Taylor JK, Steffes MW, Salahudeen AK, Flessner MF, Akylbekova EL, Fox CS, Garrison RJ. The relation of C-reactive protein to chronic kidney disease in African Americans: the Jackson Heart Study. *BMC nephrology.* 2010 Jan 15;11(1):1.
6. Sesso HD, Wang L, Buring JE, Ridker PM, Gaziano JM. Comparison of interleukin-6 and C-reactive protein for the risk of developing hypertension in women. *Hypertension* 2007, 49(2) :304-10.29.
7. Savoia C, Schiffrin EL. Inflammation in hypertension. *Curr Opin Nephrol Hypertens* 2006;15(2):152-8.
8. Kern PA, Ranganathan S, Li C, Wood L, Ranganathan G. Adipose tissue tumor necrosis factor and interleukin-6 expression in human obesity and insulin resistance. *Am J Physiol Endocrinol Metab* 2001; 280(5) :E745-51.
9. Tsigos C, Kyrou I, Chala E. Circulating tumor necrosis factor alpha concentrations are higher in abdominal versus peripheral obesity. *Metabolism* 1999;48(10):1332-5.
10. Tung CW, Hsu YC, Shih YH, Lin CL. Association of Adiponectin with High-Sensitivity C-Reactive Protein and Clinical Outcomes in Peritoneal Dialysis Patients: A 3.5-Year Follow-Up Study. *PLoS ONE.* 2015; 10(10): e0141058. <https://doi.org/10.1371/journal.pone.0141058>.
11. Iseki K, Tozawa M, Yoshi S, Fukiyama K. Serum C-reactive protein (CRP) and risk of death in chronic dialysis patients. *Nephrology Dialysis Transplantation.* 1999; 14(8): 1956–1960.
12. Lee BT1, Ahmed FA2, Hamm LL3,4,5, Teran FJ6, Chen CS7, Liu Y8, Shah K9, Rifai N10, Batuman V11,12, Simon EE13,14, He J15,16,17, Chen J18,19,20. Association of C-reactive protein, tumor necrosis factor-alpha, and interleukin-6 with chronic kidney disease. *BMC Nephrol.* 2015 May 30;16:77. doi: 10.1186/s12882-015-0068-7.
13. Adejumo OA, Okaka EI, Okwuonu CG, Iyawe IO, Odujoko OO. Serum C-reactive protein levels in pre-dialysis chronic kidney disease patients in southern Nigeria. *Ghana Medical Journal.* 2016;50(1):31-38.