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EVALUATION OF C-REACTIVE PROTEIN LEVEL IN PATIENTS WITH RENAL DISEASE IN NNAMDI AZIKIWE UNIVERSITY TEACHING HOSPITAL, NNEWI, ANAMBRA STATE, NIGERIA

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ABSTRACT

Cardiovascular disease is the major cause of hospitalization and mortality in chronic kidney disease (CKD). C-reactive protein (CRP) is a marker of cardiovascular disease and predictor of mortality in CKD patient. The CKD patients with elevated CRP should be identified on time and treated to avoid cardiovascular risk factors as well as reducing the mortality rate. This study evaluated the level of C - reactive protein in renal disease patients in Nnamdi Azikiwe University Teaching Hospital, Nnewi. A total number of 90 subjects were used for this study (45 patients with CKD and 45 healthy subjects as control), age ranged from 18 year to 65 years. They were grouped as young adults (age 18-35years) and older adults (greater than 35years). Their blood sample was collected and separated; the serum CRP level determined using the biosystem kit procedure. The values obtained were statistical analyzed and P-value of <0.05 taken as significant. The result showed the mean value of C-reactive protein of the renal disease patients (1.44± 0.50) was significantly higher when compared with the control group (1.13± 0.34). This finding concluded a high level of CRP in renal disease patient when compared with the control groups.

KEYWORD: C-reactive protein, Renal Patient, NAUTH Nnewi.

INTRODUCTION

The renal system or urinary tract consists of the kidneys, ureters, bladder, and the urethra. In the human urinary system there are two kidneys that are located between the dorsal body wall and parietal peritoneum on both the left and right sides. Chronic renal disease (CRD) also called Chronic kidney disease (CKD) describes the gradual loss of kidney function. The kidney filters wastes and excess fluids from the blood which are then excreted in the urine. When chronic kidney disease reaches an advanced stage, dangerous levels of fluids, electrolytes and waste build up in the body. Chronic kidney disease (CKD) encompasses all degrees of diseased renal function, from damaged at risk through mild, moderate, and severe chronic kidney failure, and is more prevalent in elderly population. However, while younger patients with CKD experience progressive loss of kidney function, 30% of patients over 65 years of age with CKD have stable disease.[1]

The levels of inflammatory markers like fibrinogen, homocysteine and C-reactive protein (CRP) are high in CKD patients with cardiovascular disease (CVD).[2] Cardiovascular disease accounts for about 40% of hospitalization and 50% of mortality in CKD patients at all stages.[3]

C-reactive protein is an annular pentameric protein found in the blood plasma whose levels rises in response to inflammation,[4] the level of <1mg/l, 1-5mg/l, and >5mg/l correspond to low, moderate, and high-risk group.[5] Recent data support the concept that CRP is associated with the prevalence, progression and prognosis of renal dysfunction in non-Hispanic whites.[6] Annuk et al,[7] reported that CRP provides complementary prognostic information regarding future

cardiovascular disorders in renal patients. It has also been reported that high levels of CRP is linked with the development of atherosclerosis in CKD patients.[8] Base-line serum levels of CRP are predictive of future myocardial infarction and sudden cardiac death in apparently healthy subjects suggests the hypothesis that chronic inflammation might be important in the pathogenesis of atherothrombosis. Since CRP production is mediated by several inflammatory mediator, and are elevated in dialysis patients and cardiovascular disease and can lead to mortality in chronic renal disease patients, this study is designed to evaluate the level of CRP in renal disease patients attending clinic in Nnamdi Azikiwe University teaching hospital Nnewi in Anambra state, Nigeria.

MATERIALS AND METHOD

This is a cross-sectional study designed to evaluate C-reactive protein in renal disease patients in Nnamdi Azikiwe University Teaching Hospital Nnewi. A total of 90 consenting subjects were recruited into this study, they comprised 45 renal disease patients grouped as young adult aged 18 – 35 years (15) and older adults greater than 35 years (30). Forty-five 45 apparently healthy adults of the same age range were used as the control group. Five milliliters (5mls) of blood was collected from the subjects into plain tubes and centrifuged to obtain serum for the estimation of C-reactive protein values. The analysis was done using Biosystems kit (S.A Costa Brava, Spain) for C-reactive protein test following the procedure described by the manufacturer. Statistical analysis was done on the values obtained using the student t-test of statistical package for social science (SPSS) version 23 to compare the values between groups.

RESULT

The result shows that the mean value of CRP in the CKD patients (1.44±0.50) was significantly higher ($p>0.05$) when compared with the control apparently healthy group (1.13±0.34) (Table 4.1).

The comparison of CRP among different age group showed no significant difference in the mean levels of CRP (1.47±0.51) of the control subject within the age range of 18-35years when compared with the mean level of CRP (1.71±1.53) of the control subject within the age range of >35 years and there was also no significant difference in the mean levels of CRP (3.31±1.74) of the CRD patients within the age range of 18-35years when compared with the mean level of CRP (2.92±2.41) of the CRD patients within the age range of >35years (Table 4.2).

Comparison of CRP among different genders revealed no significant difference in the mean levels of CRP (1.40±0.50) of the male control subject when compared with the mean level of CRP (1.37±0.34) of the female control subject, and also no significant difference in the mean levels of CRP (1.95±0.86) of the male CRD patients when compared with the mean level of CRP (1.47±0.64) of the female CRD patients (Table 4.3).

Table 4.1: Comparison of CRP value between the CRD patients and control subjects.

Parameter	CRD patients	control	t-value	p. value
CRP mg/L	1.44±0.50	1.13±0.34	19.28	0.04

Table 4.2: Comparison of CRP value among different age group.

	Control group	CKD Patient
Age	CRP	CRP
18 -35 years	1.47±0.51	3.31±1.74
>35 years	1.71±1.53	2.92±2.41
t-value	1.63	1.94
p-value	0.43	0.75

Table 4.3: Comparison of CRP value among different gender.

	Control group	CRD patients
Gender	CRP	CRP
Male	1.40±0.50	1.95±0.86
Female	1.37±0.34	1.47±0.64
t-value	1.26	1.50
p-value	0.34	0.92

DISCUSSION

The study on the effect of renal disease on C-reactive protein level was designed to assess the level of C-reactive protein following renal disease. The study showed that the mean level of CRP was significantly higher in the CRD patients when compared with the control group. This findings agrees with Muntner *et al.*, 2004,[8] who reported that the levels of inflammatory

markers like fibrinogen, homocysteine, CRP are high in CRD patients with coronary heart disease. The findings also agrees with sathi *et al* 2015,[9] who stated that CRP has been reported to be highly valuable in predicting cardiovascular risk in CRD patients, hence can serve as a biomarker to estimate cardiovascular risk.

CRP is an annular protein that rises in response to inflammation and CRD patients with elevated CRP have greater chances of developing cardiovascular disease. CRP is largely produced by the liver when encountering an acute and chronic inflammation. From the findings of this study it can be deduced that the level of C-reactive protein in chronic renal disease patients is high when compared with the control subject. This can be as a result of inflammation in the chronic renal disease patients; therefore therapeutic intervention should be instituted early in these patients in other to reduce associated cardiovascular risk. Age and gender of the subjects recruited for this study, showed no significant difference in the levels of C-reactive protein as shown on tables 4.2 and 4.3 respectively.

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