www.jmscr.igmpublication.org
Index Copernicus Value: 79.54
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossrefDOI: https://dx.doi.org/10.18535/jmscr/v7i3.155

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

A Comparative Study of Serum C-Reactive Protein, Urea and Creatinine Levels in Chronic Kidney Disease Patients with Normal Subjects

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Abstract

Introduction: *Chronic diseases have become a major public health problem. Chronic diseases are a leading cause of morbidity and mortality in India and other low and middle-income countries. Kidney damage is defined as "pathologic abnormalities of marker of damage, including abnormalities in blood or urine tests or imaging studies."*

Aims and Objective: *This study aims to estimate C-reactive protein, urea, creatnine levels, which is an indicator of inflammation and prognonosis in CKD because this will help the medical staff for proper management with less morbidity and mortality.*

Methods of Assay: *Estimation of serum C-reactive protein, serum urea, and creatinine will be assessd by using commercially reagents and kits.*

Result: *CKD is more common in old age group or chance of that majority of our patients where male and in the age group of 10-60 getting CKD increases as the age of person increases. The male constituted about 60% of the total. While female patients constituted about 40% of total patients.*

Conclusion: *It is concluded that maximum number of chronic kidney diseases occur in the man than women. Age prone to kidney diseases is 41-50 years. CKD is directly proportional to age.*

Introduction

Chronic diseases have become a major public health problem. Chronic diseases are a leading cause of morbidity and mortality in India and other low- and middle-income countries. The chronic diseases account for 60% of all deaths worldwide. Eighty percentage of chronic disease deaths worldwide occur in low and middle-income countries.[1] CKD is defined as kidney damage or glomerular filtration rate (GFR) <60 mol/min/1.73 m2 for 3 months or more, irrespective of cause.[2] Kidney damage is defined as "pathologic abnormalities or markers of damage, including abnormalities in blood or urine tests or imaging studies."[3] CKD can be detected via simple biochemical tests including a creatinine-based estimate of the glomerular filtration rate (GFR). Serum C Reactive protein level is elevated in patients with chronic kidney disease.[4-5] Urea, and creatinine concentrations of middle and late stage chronic kidney disease patients were obviously higher than those of healthy people and early stage chronic kidney disease patients.[6, 7]

In community based studies, the chronic kidney disease prevalence has been reported between 0.16% and 0.79%. The studies were designed to

detect stage -3 chronic kidney disease or worse and the renal prevalence of chronic kidney disease is higher than the reported number.[8,9,10]

The end stage renal disease incidence has been reported to be 160 to 232 (PMP). The projected end stage renal disease prevalence was 785 to 870 pmp.[11, 12, 13] There are different renal function parameters to indicate reduced kidney function. CKD typically increases with age and therefore there is increased risk in older adults. It is found that females are less prone to the risk of CKD.[14, 15]

The declaration of World Kidney Day to be observed annually beginning in March 2006 sends a clear message to the public, government health officials, physicians, allied health professionals, patients, and families that 'CKD is common, harmful, and treatable'[16] The incidence of CKD increases with age. The annual incidence in middle aged is about 1%. Women have higher incidence of CKD but lower risk for kidney failure than men. African Americans have higher risk for kidney failure.[17,18]

So this study is designed to determine the following:-

- To estimate serum level of C-reactive protein, urea and cretnine in normal subjects.
- To estimate serum serum level of C-reactive protein, urea and creatnine level in CKD.
- To compare serum level of C-reactive protein, urea and creatnine in CKD patients and normal subjects.

Methodology

Study Place and Design

This study will be carried out in department of Biochemistry in collaborations with department of medicine, and department of microbiology of pacific medical college and hospital, Udaipur. It is observational case control study, will include 100 subjects. Out of 100 subjects, 50 patients of chronic kidney disease and another 50 normal subjects will be age and sex matched healthy volunteers as control group. The control group will be taken for patient's attendants, staff, and student and may be from private laboratories which conduct routine serum check up of healthy persons.

Investigations

- Estimation of serum urea

Principal

The quantitative estimation serum urea is done by semi-analyzer using enzymatic kit

- Estimation of serum creatnine

Principal

The quantitative estimation serum urea is done by semi-analyzer using enzymatic kit

- Estimation of serum C-reactive protein

PrincipalSemi-quantitative analysis of CRP is done by Latex agglutination method.

Statically Analysis

Data will be entered on SPSS in the form of master chart. This data will be classified and analyzed as per aims and objectives. Quantitative data will be expressed in the form of Mean + SD .Infrence will be drawn with the use of appropriate test of significance.

Observation

Table-:1

Mean ± SD of Various Parameters of Cases & Control Group Subjects

Parameters	Mean + SD		P-Value	Significance
	CONTROL	CASE		
Urea	32.78±4.52	102.34±24.92	<0.0001	HS
Creatinine	1.014±0.19	10.64±2.56	<0.0001	HS
CRP	-	-	>0.05	NS

NS- Not Significant
HS- Highly Significant

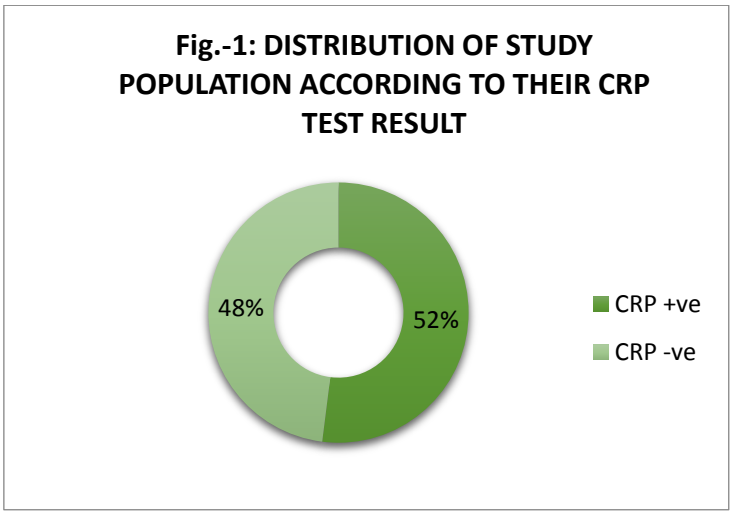

Table:-2 Distribution of Cases According to CRP Result

	NO.	(%)
CRP +ve	26	52.0
CRP –ve	24	48.0

Table 3:- Distribution of Cases According to their Age

AGE	NO.	(%)
10-20 YEARS	**1**	**2.0**
21-30 YEARS	**4**	**8.0**
31-40 YEARS	**8**	**16.0**
41-50 YEARS	**20**	**40.0**
51-60 YEARS	**17**	**34.0**
TOTAL	**50**	**100.0**

Result & Discussion

Table 1 shows that The mean serum Urea level was found to be 32.78±4.52 mg/dl in control subjects and The mean serum urea level was found to be 102.34±24.92 mg/dl in the patients of chronic kidney disease and p-value is <0.0001 and highly significant .

Table 1 shows that The mean serum creatinine level was found to be 1.014±0.19 in control subjects and The mean serum creatinine level was found to be 10.64±2.56 mg/dl in patients of chronic kidney disease and p-value is <0.0001 and highly significant. This increase might be due to decreased excretion of creatinine by poor functioning of kidney.

Table no.1 shows that all control subjects have CRP test negative means they do not have any kidney disease particularly or their renal function is normal. As CRP is an acute phase reactant, it is a marker of inflammation; its negativity shows absence of inflammation in control High CRP levels provide prognostic information in patients with CKD

Table No.2 and Fig.1 shows in patients with chronic kidney disease, 26 patients (52%) s are showing increased level of CRP but 48% patients show negative CRP level which means low level and this value does not correlates with previous studies done in past and establish the need of further study of CRP level in CKD patients. The question as to whether inflammation contributes to progressive renal dysfunction in CKD patients needs further investigation.

Table 3 show that the maximum number of cases 20 (40 %) were in age group of 41-50 years, followed by 17 (34 %) cases in 51-60 and minimum number (02%) of cases was in age group 10-20 followed by (08 %) cases in 21-30 age group. Number of CKD patients is less in younger age group.

Conclusion

From above it is concluded that maximum number of chronic kidney diseases occur in the men than women. Age prone to kidney diseases is 41to 50 years. CKD is directly proportional to age. Men are more vulnerable because of their smoking; drinking habits. Other etiological factors include genetic, atherosclerosis, diabetes, obesity etc. Non- malignant hypertension is also an initiator of kidney diseases. Early diagnosis and precautions should be taken to minimize the ill effects of CKD.

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