



## A STUDY OF ASSOCIATION BETWEEN DYSLIPIDEMIA WITH RENAL OUTCOME IN CKD PATIENTS.

Akanksha Shukla

PHD Student, Department Of Zoology, Himalayan University Arunachal Pradesh, India.

Ashutosh Soni\*

Associate Professor &amp; HOD, Department Of Nephrology, Pacific Medical College &amp; Hospital, Udaipur, Rajasthan, India. \*Corresponding Author

### ABSTRACT

**Background-** To study the lipid profile in our patients with chronic renal insufficiency. **Methods-** This is prospective study conducted in Department of Nephrology from Oct-2019 to Oct-2020 at Pacific Medical College & Hospital, Udaipur, Rajasthan, after taking an informed consent. Total 100 patients were included in this study who were diagnosed with chronic kidney disease (CKD). With the help of clinical history, examination and investigations data were collected.

**Results-** Normal Serum HDL values ranged between 40mg/dl to 46mg/dl. Patients showed abnormal HDL levels (<40 mg/dl) were 43. There was a significant reduction in HDL levels in patients with CKD. In 18 patients abnormally high LDL levels (>130mg/dl) were found. Triglycerides (TG) levels were abnormal in 37 patient's shows > 160mg/dl. Total cholesterol was more than 200mg/dl in 26 patients.

**Conclusion-** In chronic kidney disease patients' total cholesterol is significantly increased as well as triglyceride level also increased. Therefore dyslipidemia is common complication of CKD. Hence early diagnosis of dyslipidemia indicated potential therapeutic approaches like therapeutic life style changes and pharmacotherapy should be initiated to limit the long term consequences of cardiovascular disease in this population.

**KEYWORDS :** Chronic Kidney Disease, Low Density Lipoprotein, High Density Lipoprotein, Triglycerides

### INTRODUCTION

Chronic kidney disease (CKD) is a global public health problem, with greater burden and very high cost of care especially in developing countries like India. The National Kidney Foundation in India states that, kidney diseases rank 3<sup>rd</sup> amongst the life-threatening diseases after cancer and heart disease. About 200,000 persons landed into terminal kidney failure every year and millions more suffer from lesser forms of kidney diseases.<sup>1</sup>

Chronic kidney disease (CKD) results in profound dysregulation of several key enzymes and metabolic pathways that eventually contributes to disordered high-density lipoprotein (HDL) cholesterol and triglyceride-rich lipoproteins.<sup>2</sup> With the progression of CKD, these metabolic derangements may be further worsened and participate in atherogenic diathesis and possibly renal functional progression itself.<sup>3</sup> A large number of epidemiological studies have suggested the independent role of dyslipidemia on cardiovascular morbidity and mortality in the general population.<sup>4</sup> In CKD populations, the relationship of dyslipidemia with cardiovascular disease is inconclusive and paradoxical.<sup>5</sup> However, published data regarding the relationship between dyslipidemia and renal outcomes in moderate to advanced CKD stages are limited.

Indian studies on lipid profile in CRF have not been consistent. Sharma, *et al*<sup>6</sup> and Kunde *et al*<sup>7</sup> observed no hyperlipidemia in patients of chronic renal failure (CRF). On the other hand, Gupta<sup>8</sup> and Das *et al*<sup>9</sup> observed lipid abnormalities similar to those reported in Western studies i.e. hypertriglyceridemia and reduced high density lipoprotein (HDL).<sup>10,11</sup> In view of the inconsistency in Indian reports, we decided to study the lipid profile in our patients with chronic renal insufficiency.

### MATERIALS AND METHODS

This is prospective study conducted in Department of Nephrology from Oct-2019 to Oct-2020 at Pacific Medical College & Hospital, Udaipur, Rajasthan, after taking an informed consent. Total 100 patients were included in this study who were diagnosed with chronic kidney disease (CKD). With the help of clinical history, examination and investigations data were collected.

Patients with more than 18 year of age with physical and history with clinical findings of kidney disease and Biochemical evidence of CKD were include in this study. Sonological abnormalities suggesting CKD also included in this study.

Written consent was obtained from both patients and controls. A detailed history regarding symptoms and duration of the kidney disease, hypertension, diabetes, smoking, alcoholism, drug intake, and treatment was elicited.

A detailed clinical examination was performed in all patients. Blood pressure, renal function tests, and abdominal ultra-sonogram were done for all patients. Blood sample was taken for lipid profile from patients.

### Ethics statement

The study protocol was approved by the institutional ethical committee. informed consents were obtained in written form from patients and all clinical investigation was conducted according to the standard protocol. the patients gave consent for the publication of the clinical details.

### Data analysis

Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categorical variables chi-square test was used. For continuous variables independent samples' *t*-test was used. *p*-value <0.05 was considered as significant.

### RESULTS

In present study, maximum patients (53.00%) were from 45-60 yrs age group. Mean age of patients was 52.36±10.36 yrs. 56.00% patients were male and 44.00% patients were female.

**Table 1 Associated disease wise distribution of study subject**

Associated disease	No of cases	Percentage
DM	31	31.00
HT	26	26.00
Nephritis	22	22.00
Rheumatic heart disease	1	1.00
Others	52	52.00

In present study, 26.00% patients were from HT, 31.00% patients were from DM and 22.00% patients were from nephritis.

**Table 2 Renal function test in study subject**

Renal function test	Mean	SD
Serum creatinin (mg/dl)	8.20	3.47
Blood urea (mg/dl)	144.66	50.57

In present study, serum creatinin level was 8.20±3.47 mg/dl and blood urea level was 144.66±50.57 mg/dl

**Table 3 CKD patients showed the following lipid disorder**

Type of lipid abnormality	No of patients	Percentage
Increased cholesterol	26	26.00
Decreased HDL	43	43.00
Increased LDL	18	18.00
Increased triglyceride	37	37.00

Normal Serum HDL values ranged between 40mg/dl to 46mg/dl. Patients showed abnormal HDL levels (<40 mg/dl) were 43. There was a significant reduction in HDL levels in patients with CKD. In 18 patients abnormally high LDL levels (>130mg/dl) were found. TG levels were abnormal in 37 patient's shows > 160mg/dl. Total cholesterol was more than 200mg/dl in 26 patients.

**Table 4 Correlation between lipid fractions and GFR in patients**

Type of lipid abnormality	GFR level (ml/min)			Total
	<15	15-29	≥30	
Increased cholesterol	2	18	6	26
Decreased HDL	5	28	10	43
Increased LDL	4	8	6	18
Increased triglyceride	2	29	6	37

Maximum dyslipidemia was seen in 15-29 ml/min GFR group.

## DISCUSSION

In this study, Low HDL levels and Hypertriglyceridemia were found most common lipid abnormalities. As in study of Diana M Lee LG et al<sup>13</sup> patients with chronic kidney disease there is low HDL levels which in similar to this study

According to study of Lawrence et al<sup>14</sup> in CKD patients with low HDL levels is one of the independent risk factor for progression of kidney disease.

Out of 100 patients 18 patients showed elevated LDL levels. From many studies it is found that Patients usually have normal or slightly reduced concentrations of LDL.<sup>13,14</sup>

In this study, abnormal triglyceride values were found in 37 of patients. CKD commonly followed by lipid abnormality in the form of hypertriglyceridemia. Similar observations was made in Western studies and recent Indian studies by Gupta DK, Das BS and Bagdae J C levels.<sup>15,16,17</sup>

Out of total 26 patients shows total cholesterol levels were elevated in combination with chronic renal insufficiency results in acquired LDL receptor deficiency that plays important role in the genesis of the associated hypercholesterolemia. This study found that abnormal TC, HDL, serum triglycerides to be increased significantly in the group of eGFR between 15-29ml.

Several mechanisms may underlie these reductions in HDL cholesterol levels, which is usually an indication of impaired reverse cholesterol transport. Apo AI, which is the activator of lecithin cholesterol acyltransferase (LCAT), is reduced in CKD due to down regulation of hepatic Apo AI genes leads to decline in the activity of LCAT, which causes reduced cholesterol esterification and impairment of HDL maturation. The activity of LCAT is consistently diminished in CKD, so there is decrease in HDL levels.<sup>18</sup>

The present study demonstrates that CKD is commonly accompanied by lipid abnormality in the form of hypertriglyceridemia. This is similar to the observations made in Western studies and recent Indian studies by Gupta DK, Das BS and Bagdae J C levels.<sup>15,16,17</sup> Elevated triglyceride levels are due to impaired activity lipoprotein lipase (LPL) and direct inhibitory effect of various uremic 'toxins' on the enzymes involved in lipid metabolism represent the most important pathophysiological mechanisms underlying the development of hypertriglyceridemia in renal failure.<sup>19</sup> Chan MK et al, also found hypertriglyceridemia was the major abnormality in their studies.<sup>20</sup> Hypertriglyceridemia represents an early feature of renal failure.

## CONCLUSION

In chronic kidney disease patients total cholesterol is significantly increased as well as triglyceride level also increase. Therefore dyslipidemia is common complication of CKD. Hence early diagnosis of dyslipidemia indicated potential therapeutic approaches like therapeutic life style changes and pharmacotherapy should be initiated to limit the long term consequences of cardiovascular disease in this population.

## CONFLICT OF INTEREST:

there is no conflict of interest between authors.

## ABBREVIATION:

HDL High Density Lipoprotein  
LDL Low Density Lipoprotein  
LCAT lecithin cholesterol acyltransferase

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