



A Study of Fasting Lipid Profile in Chronic Kidney Disease Patients

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Abstract

Background: Dyslipidemia is very much common in chronic kidney disease patients and is responsible for cardiovascular disease (CKD) which is most common cause of mortality in them. So, it is necessary to study the lipid profile in CKD patients to prevent morbidity and mortality

Methods: This is a cross-sectional observational study conducted about lipid profile on CKD patients with normal healthy controls at our hospital after considering inclusion and exclusion criteria. Lipid profile was collected from eligible patients and controls.

Results: There were a statistically significant decrease in HDL and increase in triglyceride, low-density lipoprotein (LDL), and total cholesterol levels when compared with normal healthy controls.

Conclusion: We concluded that high serum cholesterol, LDL, triglyceride and low HDL cholesterol were found in CKD patients.

Keywords: CKD, Hypertriglyceridemia, Lipid profile

Introduction

Chronic kidney disease (CKD) an inevitable terminal event of chronic renal parenchymal disease due to various causes is known more for its morbidity than for its mortality. Since, the advent of dialysis, the severity of the CKD consequences undergone profound changes.

Chronic kidney disease (CKD) has become a public health problem with a global prevalence of around 8–16%^{1,2} and with an estimate of >10% (i.e., >20 million) prevalence in the adult United States population.³ Data from National Health and Nutrition Examination Survey showed that CKD prevalence among ages 60 and above increased from 18.8% in 1988-1994 to 24.5% in 2003-2006.⁴

Ischemic heart disease and other complications of atherosclerosis are the most common cause of death in patients with chronic renal failure. The pathogenesis of cardiovascular diseases in these patients is of multifactorial origin. Dislipidemia and hyperhomocysteinemia are important factors associated with the early onset of atherosclerosis.⁵

Chronic renal failure is often associated with dyslipoproteinemia, high levels of cholesterol and triglycerides, as well as a decrease in the polyunsaturated fatty acids. Each of these abnormalities has been identified as an independent risk factor for atherosclerosis. Some of them persisting and becoming worse during dialysis treatment. On the other hand, an increment of plasma homocysteine concentration is highly prevalent among patients under hemodialysis, and it is considered an independent risk factor for atherosclerotic complications of end-stage renal disease.^{6,7}

Since hyperlipidemia can be modulated by therapeutic intervention, it is worthwhile to study and compare lipid profile abnormalities in CKD patients. Indian studies on lipid abnormalities in CKD have not been consistent. In view of inconsistency and limited evidence in the India, it was decided to study the lipid profile in our patients with CKD patients.

Materials and Methods

This cross-sectional observational study was conducted in 50 patients with CKD and 50 normal healthy persons.

Inclusion Criteria

- Patients between the age group of 15 and 85 years with established CKD.
- Patients who were on conservative or dialysis treatment for CKD.
- Established renal failure was ensured by radiological evidence or biochemical evidence for >3 months.

Inclusion Criteria for Controls- Normal healthy patients who were age and sex related to patients were included as controls.

Exclusion Criteria

- Patients with acute renal failure and nephrotic syndrome.
- Patients having diabetes, liver disease, Cushing’s, or other metabolic disorder.
- Those who are on drugs affecting lipid metabolism such as β-blockers, statins, and oral contraceptive pills.
- Female patients who were pregnant.

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 ultrasonogram were done for all patients. Blood sample was taken for lipid profile from patients and controls.

Results

Table 1: Distribution of age and sex ratio

Variable	Cases	Control	p-value
Age	48.52 ±7.14	38:12	>0.05
Sex (M:F)	34:16	35:15	>0.05
Rural : Urban	25:25	26:24	>0.05

Both group were comparable

Table 2: The level of total cholesterol among the cases of CKD and control group

Total Cholesterol	No. of cases	Mean ± S.D.	p-value
Control	50	180.23 ± 12.35	0.001
CKD Patients	50	210.23 ± 39.70	

Table 3: The level of HDL among the cases of CKD and control group

HDL	No. of cases	Mean ± S.D.	p-value
Control	50	56.23 ± 4.16	0.001
CKD Patients	50	40.23 ± 11.06	

Table 4: The level of LDL among the cases of CKD and control group

LDL	No. of cases	Mean ± S.D.	p-value
Control	50	105.32 ± 13.42	0.001
CKD Patients	50	136.23 ± 24.14	

Table 5: The level of Triglycerides among the cases of CKD and control group

Triglycerides	No. of cases	Mean ± S.D.	p-value
Control	50	106.23 ± 15.10	0.001
CKD Patients	50	189.32 ± 49.14	

Discussion

Total cholesterol levels were significantly elevated in our study group. We observed the same findings in the study by Lee et al.⁸ However, most of the studies did not observe hypercholesterolemia. The possible reason for the hypercholesterolemia in our study is significant elevation of cholesterol-containing lipid fractions (IDL and LDL).

The low HDL levels in patients with CKD in our study were consistent with Lee et al.⁸ who studied the lipid profile in CKD patients. Several mechanisms may underlie these reductions in HDLC levels, which is

usually an indication of impaired reverse cholesterol transport. Thus, uremic patients usually exhibit decreased levels of apolipoprotein AI and AII (the main protein constituent of HDL). Diminished activity of LCAT (the enzyme responsible for the esterification of free cholesterol in HDL particles) as well as increased activity of cholesterol ester transfers protein that facilitates the transfer of cholesterol esters from HDL to TGL-rich lipoproteins that reduce serum concentrations of HDL cholesterol. In MDRD study, low HDL levels in CKD patients were one of the independent risk factors for the progression of kidney disease.

LDL was significantly elevated than that of controls in our study. This observation is similar to the studies of Lee et al.⁸. In an article published in archives of internal medicine, 32 patients were studied and compared the lipid profile on CKD and non-CKD patients.⁹

Triglycerides were significantly elevated in our study than control group. Shah et al. most western studies demonstrated that hypertriglyceridemia was the abnormality found in CKD patients. Gupta et al.¹⁰, Das et al.¹¹, Bagdade et al.¹², and Chan et al.¹³ also found that hypertriglyceridemia was the major abnormality in their studies.

Conclusion

We concluded that high serum cholesterol, LDL, triglyceride and low HDL cholesterol were found in CKD patients.

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