ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
Index Copernicus Value: 68 . 16
PubMed - National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 4, Issue – 3, June - 2019, Page No. : 144 – 147

A Study of Fasting Lipid Profile in Chronic Kidney Disease Patients

Dr. Mahaveer Swami[1], Dr.O.P.Patidar[2], Dr. R.N.Meena[3]

[1]Resident Doctor, [2]Professor & HOD, [3]Associate Professor

SRG Hospital, Jhalawar Medical College, Jhalawar, Rajasthan.

Corresponding Author: Dr. O. P. Patidar, Professor & HOD, SRG Hospital, Jhalawar Medical College, Jhalawar, Rajasthan.

Type of Publication: Original Research Paper

Conflicts of Interest: Nil

Abstract

Background: Chronic renal failure results in profound lipid disorders which stem largely from the deregulation of high-density lipoproteins (HDL) and triglyceride-rich lipoprotein metabolism which increases the risk of arteriosclerotic cardiovascular disease which is the leading cause of mortality among chronic kidney disease (CKD) patients.

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: Treatment of dyslipidemia helps to decrease mortality in CKD patients.

Keywords: Chronic kidney disease, Hypertriglyceridemia, Lipid profile

Introduction

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 Rajasthan, 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. All the patients in this study group were selected from the Department of General Medicine, SRG Hospital, Jhalawar. The controls were selected from those who were accompanying the patients.

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

	No. of cases	Age	Sex ratio (Male:Female)
Control	50	48.52 ±7.14	38:12
CKD Patients	50	49.12±7.02	34:16
p-value		>0.05	>0.05

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	181.46 ± 16.84	0.001
CKD Patients	50	208.42 ± 39.84	

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	52.43 ± 4.02	0.001
CKD Patients	50	42.22 ± 11.54	

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	111.43 ± 13.42	0.001
CKD Patients	50	132.42 ± 24.24	

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	109.24 ± 15.24	0.001
CKD Patients	50	180.23 ± 49.23	

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

This cross sectional study showed that high serum cholesterol, LDL, triglyceride and low HDL cholesterol were found in CKD patients.

References

1. Pandya V, Rao A, Chaudhary K. Lipid abnormalities in kidney disease and management strategies. World J Nephrol 2015;4:83-912.
2. Jha V, Garcia-Garcia G, Iseki K, Li Z, Naicker S, Plattner B, et al. Chronic kidney disease: Global dimension and perspectives. Lancet 2013;382:260-72.
3. Fact Sheet: Sheet: General Information and National Estimates on Chronic Kidney Disease in the United States. Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention; 2014.
4. National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). Kidney Disease Statistics for the United States. Bethesda, MD: US Department

of Health and Human Services, National Institutes of Health; 2012.

5. Zoccali C: Cardiovascular risk in uraemic patients-is it fully explained by classical risk factors? Nephrol Dial Transplant 2000, 15:454-457.
6. Assman G and Schulte H: Relation of high-density lipoprotein cholesterol and triglycerides to incidence of atherosclerotic coronary artery disease (the PROCAM experience). Prospective Cardiovascular Münster study. Am J Cardiol 1992, 70:733-737.
7. Hokanson JE and Austin MA: Plasma triglyceride level is a risk factor for cardiovascular disease independent of high-density lipoprotein cholesterol level: a meta-analysis of populationbased prospective studies. J Cardiovascular Risk 1996, 3:213-219.
8. Lee DM, Knight-Gibson C, Samuelsson O, Attman PO, Wang CS, Alaupovic P: Lipoprotein particle abnormalities and the impaired lipolysis in renal insufficiency. Kidney Int 2002; 61: 209–218.
9. Sarnak MJ, Levey AS, Schoolwerth AC, Coresh J, Culleton B, Hamm LL, et al. Kidney disease as a risk factor for development of cardiovascular disease: Astatement from the American heart association councils on kidney in cardiovascular disease, high blood pressure research, clinical cardiology, and epidemiology and prevention. Circulation 2003;108:2154-69.
10. Gupta DK. Hypedipidemia in patents of chronic renal failure. Bombay Hospital J 1991; 33:45 50.
11. Das BS, Mishra SK, Rao DVP. Serum lipids in chronic renal failure. J Assoc Physicians India 1984; 32:1019 1021.
12. Bagdade J, Casaretto A. Effect of chronic uremia, haemodialysis and renal transplantation on plasma lipids and lipoproteins. J Clin Invest1976;87:3741
13. Chan MK, Varghese Z, Moorhead JF. Lipid abnormalities in'uremia. Kidney Int 1981; 19:625