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A STUDY OF LIPID PROFILE IN CHRONIC KIDNEY DISEASE PATIENTS

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Abstract:

Introduction: Cardiovascular disease (CVD) is a major cause of mortality and morbidity in patients with mild to moderate chronic kidney disease (CKD). Chronic Kidney Disease is a global health problem. In the United States Prevalence of CKD is increasing and affects about 19 million Americans. In the last decade United States has seen a 30% increase in patients suffering from CKD. In India due to chronic diseases the projected number of deaths will increase from 3.78 million in 1990 (40.4% of all deaths) to an expected 7.63 million in 2020 (66.7% of all deaths). Over the past few decades, it was accepted that CKD is related with a high mortality rate and accelerated Cardio-Vascular (CV) disease. The prevalence of clinical coronary heart disease is 40% in which CVD mortality is 10 to 30 times higher compared to the general population of the same gender, age and race. Dyslipidemia may be aggravated by dialysis especially continuous ambulatory peritoneal dialysis (CAPD). Dyslipidemia among CVD negatively impacts which turn influence the frequency and/or duration of hospitalizations. Patients on CAPD exhibit low density lipoprotein (LDL) and high levels of total cholesterol (TC). **Aim:** The main aim of study is to know about abnormalities pattern of lipid profile in chronic kidney disease patients. **Material and methods:** This is prospective study conducted in Department of General Medicine of Prasad Institute of Medical Sciences and Prasad Hospital Lukhnow, India during 1 year. Total 150 patients were included in this study that was diagnosed with chronic kidney disease. Patients with more than 20 year of age with physical and history with clinical findings of kidney disease and Biochemical evidence of CKD were recorded for data collection. Sonological abnormalities suggesting CKD also recorded. From all the patient's Blood samples were taken after a minimum of nine hours of fasting then were asked to have a light fat free diet on the day prior to sampling. On the same day the samples were analyzed for the levels of trigycerides, HDL, LDL, and total cholesterol levels. **Result:** In above table shows maximum number of cases in 21-30 years of age group (27.3%) followed by 31-40 years (24.0%). The above table showed 90 (60.0%) were males and 60 (40.0%) were females. Normal Serum HDL values ranged between 23mg/dl to 46mg/dl. Patients showed abnormal HDL levels (<40 mg/dl) were 56. There was a significant reduction in HDL-C levels in patients with CKD. In 23 patients abnormally high LDL levels (>130mg/dl) were found. TGL levels were abnormal in 41 patient's shows > 160mg/dl. Total cholesterol was more than 200mg/dl in 30 patients. **Conclusion:** Between males and females there is no significant difference in the lipid profile except for triglyceride level. 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.

Keywords: Chronic Kidney Disease (CKD), Lipid Profile, Cardiovascular disease (CVD)

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INTRODUCTION

Cardiovascular disease (CVD) is a major cause of mortality and morbidity in patients with mild to moderate chronic kidney disease (CKD)[i]. Chronic Kidney Disease is a global health problem. In the United States Prevalence of CKD is increasing and affects about 19 million Americans. In the last decade United States has seen a 30% increase in patients suffering from CKD[ii,iii]. Due to the absence of a renal registry, in the Indian population the exact disease burden of CKD cannot be assessed accurately. In India due to chronic diseases the projected number of deaths will increase from 3.78 million in 1990 (40.4% of all deaths) to an expected 7.63 million in 2020 (66.7% of all deaths)[iv,v]. Over the past few decades, it was accepted that CKD is related with a high mortality rate and accelerated Cardio-Vascular (CV) disease[vi]. The prevalence of clinical coronary heart disease is 40% in which CVD mortality is 10 to 30 times higher compared to the general population of the same gender, age and race[vii]. Dyslipidemias is a very common complication of chronic kidney disease. Disturbances in metabolism of lipoprote are noticeable even at the early stages of CRF. It usually follows downhill course that parallels deterioration in renal function[viii]. Dyslipidemia may be aggravated by dialysis especially continuous ambulatory peritoneal dialysis (CAPD). Dyslipidemia among CVD negatively impacts which turn influence the frequency and/or duration of hospitalizations. Patients on CAPD exhibit low density lipoprotein (LDL) and high levels of total cholesterol (TC)[ix,x]. Many cross-sectional studies have observed that variable results of lipid levels are related to their duration on dialysis[xi]. There should be complete fasting lipid profile with total, high-density lipoprotein and LDL in cholesterol, triglycerides measured to identify those at risk and require treatment. The National Cholesterol Education Program Adult Treatment Panel III guidelines suggested the treatment approach parallels that which the main focus of treatment is the level of LDL cholesterol. The model value of LDL is less than 100 and that of triglycerides is less than 150. Patients with CKD should be considered as "very high risk" group category and initiated insistent therapeutic action to reduce the risk of cardiovascular events[xii]. A qualitative change in LDL is seen in patients with CKD and dialysis patients. The proportion of small density LDL (sdLDL) which is considered to increased highly atherogenic. Modified LDL particles, such as oxidised LDL (ox-LDL) and and Malondialdehyde-modified LDL are taken up by macrophages via binding to several cell surface scavenger receptors. The cholesterol accumulation leads to the transformation of macrophages into foam cells in the vascular wall and contributes to atherogenesis[xiii]. There is also significantly higher in levels of lipoprotein in patients with chronic kidney disease as compared to general population. It is well accepted that high levels of lipoprotein is correlates with increased risk of atherogenesis and cardio vascular mortality[xiv]. The main aim of study is to know about abnormalities pattern of lipid profile in chronic kidney disease patients.

Material and methods:

This is prospective study conducted in Department of General Medicine of Prasad Institute of Medical Sciences and Prasad Hospital Lukhnow, India during 1 year. Total 150 patients were included in this study who were diagnosed with chronic kidney disease. With the help of clinical history, examination and investigations data was collection. Patients with more than 20 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 include in this study. From all the patient's Blood samples were taken after a minimum of nine hours of fasting then were asked to have a light fat free diet on the day prior to sampling. On the same day the samples were analyzed for the levels of trigycerides, HDL, LDL, and total cholesterol levels.

Result:

Table 1: Age wise distribution of study population

Age in group (years)	No of patients	Percentage
12-20	32	21.3
21-30	41	27.3
31-40	36	24.0
41-50	25	16.7
51-60	9	6.0
61-70	7	4.7

In above table shows maximum number of cases in 21-30 years of age group (27.3%) followed by 31-40 years (24.0%).

Table 2: sex wise distribution of study population

Gender	No of patients	Percentage
Male	90	60
Female	60	40

The above table showed 90 (60.0%) were males and 60 (40.0%) were females.

Table 3: CKD patients showed the following lipid disorder

Type of lipid Disorders	Number of Patients
Elevated Cholesterol	30
Decreased HDL	56
Elevated Triglycerides	41
Increased LDL Cholesterol	23

Normal Serum HDL values ranged between 23mg/dl to 46mg/dl. Patients showed abnormal HDL levels (<40 mg/dl) were 56. There was a significant reduction in HDL-C levels in patients with CKD. In 23 patients abnormally high LDL levels (>130mg/dl) were found. TGL levels were abnormal in 41 patient's shows > 160mg/dl. Total cholesterol was more than 200mg/dl in 30 patients.

Table 4: Correlation between lipid fractions and gfr in patients

Lipids	eGFR<15ml	15-29ml	30-59ml
TC ↑	6	24	4
TGL ↑	7	30	9
HDL ↓	9	35	10
LDL ↑	4	9	3

Discussion:

Globally CKD is a major health problem which leading cause of morbidity and mortality in the developed world. Patients with CKD are at high risk for cerebrovascular disease (CBVD), CVD and they are more likely to die of CVD. Premature atherosclerosis is associated with CKD and increased incidence of cardiovascular morbidity and mortality[xv].CKD intrinsically primarily affects the metabolism of high-density lipoprotein (HDL) and triglyceride (TG)-rich lipoproteins[xvi]. In chronic hemodialysis patients cardiovascular disorders are one of the most serious problems. In hemodialysis patients due to cardiovascular disease mortality is estimated to be 9% annually and is 30 times higher than general population[xvii]. In this study, Low HDL levels and Hypertriglyceridemia were found most common lipid abnormalities. As in study of Diana

M Lee LG et al patients with chronic kidney disease there is low HDL levels which in similar to this study[xviii]. According to study of Lawrence et al in CKD patients with low HDL levels is one of the independent risk factor for progression of kidney disease[xix]. In this study abnormal triglyceride values were found in 41 of patients. CKD commonly follows 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[xx,xxi,xxii&xxiii]. Out of total 23 patients showed elevated LDL levels. From many studies it is found that Patients usually have normal or slightly reduced concentrations of LDL-C levels[xxiv]. Out of total 30 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[xxv]. This study found that abnormal TC, HDL, serum triglycerides to be increased significantly in the group of eGFR between 15-29ml.

Conclusion:

In this study, HDL-C levels were lower and triglycerides, total cholesterol and TGL levels were higher. Between males and females there is no significant difference in the lipid profile except for triglyceride level. In chronic kidney disease patients total cholesterol is significantly increased as well as triglyceride level also increase. Therefore dyslipidemia is common complication of CKD. The lipoprotein abnormalities may influence the progression of renal failure. Chronic kidney disease patient's dyslipidemia and its complications are more prevalence. 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.

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