



## Evaluation Of Lipid Profile In Chronic Renal Failure Patients Receiving Conservative And Hemodialysis Treatment

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### Abstract

#### Background:

Chronic renal failure (CRF) is a permanent decline in renal function caused by the renal tissues defective functioning. Hypertriglyceridemia and low HDL concentration are the most common lipid abnormalities in chronic renal failure. The aim of our study was to compare the lipid profile of CRF patients who are receiving conservative management with that of hemodialysis patients.

#### Materials and Methods:

A Cross sectional Observational study was conducted in Vinayaka Mission Kirupanandha Variyar Medical College and Hospitals, Salem for a period of 6 months from April 2015 to September 2015. A total of 80 patients were taken for the study .Detailed history and complete physical examination and data collected were noted in a pre-designed Performa and were entered in Microsoft Excel and were analyzed through SPSS software.

#### Results:

When compared to CKD patients on conservative therapy, there was a statistically significant decline in high-density lipoprotein (HDL) and an increase in triglycerides (TG) and very-low-density lipoprotein (VLDL) levels in CKD patients on hemodialysis. Total cholesterol and low-density lipoprotein (LDL) levels were also substantially greater in CKD patients on hemodialysis compared to CKD patients receiving conservative treatment.

#### Conclusions:

Dyslipidemia in uremic patients may accelerate atherosclerosis and enhance the development of chronic renal failure. Although dyslipidemia worsens with CKD stage, early lipid profile monitoring in CKD patients may aid in delaying disease progression and, as a result, reducing mortality.

**Keywords:** Chronic renal failure (CRF),Dyslipidemia, High-density lipoprotein (HDL), Triglycerides

### Introduction

Chronic renal failure (CRF) is a permanent decline in renal function caused by the renal tissue's ineffective functioning. The resulting weakening of the kidney's excretory, metabolic, and endocrine activities contributes to the emergence of the uremia clinical syndrome. Cardiovascular disease is a leading source

of morbidity and mortality in chronic renal failure patients.<sup>[1]</sup>

In fact, CKD patients are more likely than ESRD patients to die from cardiovascular problems<sup>[2]</sup>. Many recent research have suggested that dyslipidemia in CKD patients may have a part in the development of cardiovascular disease (CVD) and kidney function

impairment [3]. CVD is the major cause of death in CKD patients, and its prevalence is significantly higher in hemodialysis patients.<sup>[4,5]</sup>

Dyslipidemia is an established risk factor for CVD in the general population, but the role of dyslipidemia as a risk factor in the progression of CKD should be further investigated and documented. Hence this study aims to compare the lipid profile of CRF patients who are receiving conservative management with that of hemodialysis patients.

## Materials And Methods

This is a cross-sectional, observational study done in Vinayaka Mission Kirupanandha Variyar Medical College and Hospitals, Salem. The study was commenced after getting the Ethical approval from the institutional ethical committee for a period of 6 months from April 2015 to September 2015.

A total of 80 patients were taken for the study and divided into two groups. One group (Group A) containing 38 subjects on conservative management and other group (Group B) of 42 subjects on Hemodialysis. Fasting serum lipid levels were measured which consisted of total cholesterol, triglycerides, low density lipoprotein (LDL), very low density lipoprotein (VLDL), high density lipoprotein (HDL).

Patients with diabetes, ischemic heart disease, who have undergone coronary artery bypass graft surgery, on lipid lowering drugs, a history of alcohol consumption and smoking, thyroid, and liver disease

were excluded from the study since these factors could affect lipid profiles and alter the results. All of the patients gave their verbal informed consent to take part in this study.

## Statistical Analysis

After creating a correct template, the data was entered into Microsoft Excel. The data was then transferred into SPSS and analysed. The mean and standard deviation of several lipid profile parameters were calculated. The unpaired t-test was used to examine the difference in the mean values of lipid analytes, and the Chi-square test was used to see the correlation of age and sex with CKD patients on conservative therapy and on hemodialysis. A P-value of less than 0.05 was considered statistically significant.

## Results

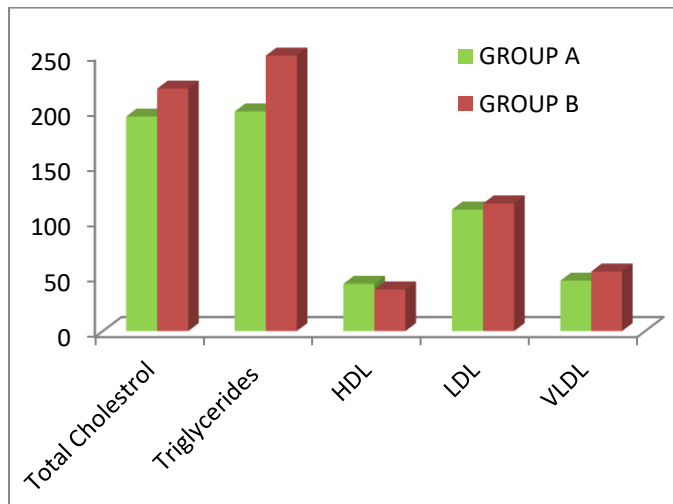
A total of 80 patients were taken for the study and divided into two groups. One group (Group A) containing 38 subjects on conservative management and other group (Group B) of 42 subjects on Hemodialysis. Table 1 show the age and sex distribution of the study participants. Age varies from 33 years to 73 years in both the groups with a mean age of  $49.10 \pm 9.89$ . In both of the groups, males were in larger proportion than that of females. Group A comprises of 24 (63.15%) males and 14 (36.84%) females. Group B contains 25 (59.52 %) males and 17 (40.47 %) females. There was no significant relationship between age and sex and CKD patients on conservative care and hemodialysis.

**Table 1: Age and Sex Distribution of Study Participants.**

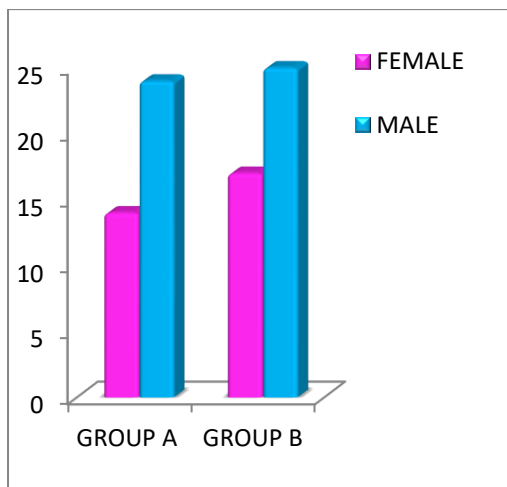
Variable		Group A: (CKD patients on conservative Management)	Group B: (CKD patients on Hemodialysis)	P Value
Age	21-40	9	12	0.05
	41-60	23	26	
	61-70	6	3	
	>70	0	1	
Sex	Male	24	25	0.042
	Female	14	17	

Figure 1 shows the lipid profile parameters of both the groups. The mean values of Total cholesterol, triglycerides, HDL, LDL and VLDL in Group A were found to be  $194 \pm 5.33$ ,  $198.57 \pm 13$ ,  $42.73 \pm 3.60$ ,  $109.89 \pm 10.60$  and  $45.55 \pm 4.39$  respectively. In Group B the mean values of Total cholesterol, Triglycerides, HDL, LDL, and VLDL were found to be  $219.19 \pm 9.30$ ,  $249.07 \pm 19.38$ ,  $37.69 \pm 5.73$ ,  $115.40 \pm 16.73$  and  $53.83 \pm 4.85$  respectively. Figure 2 shows the sex distribution of study participants. Majority of the subjects in both groups of the study were found to be males.

**Figure 1 : Mean value of Lipid Parameters in both the Groups**



**Figure 2: Sex Distribution of Study participants**



The unpaired t-test was used to compare the lipid profile patterns in both groups, and the P-value was obtained. P-values of less than 0.05 were considered significant. Total cholesterol and LDL levels were considerably lower (P-value 0.05) in Group A CKD than in Group B CKD, as shown in Table 2. Group A's TG and VLDL levels were likewise lower than Group B's, which was shown to be statistically significant (P-value 0.001). HDL was the only lipoprotein found to be higher in Group A than in Group B, and the difference was statistically significant (P-value 0.001).

**Table 2 Lipid profile of CRF patients in both the groups**

Serum Lipids	Group A Mean $\pm$ SD	Group B Mean $\pm$ SD	P Value
Total Cholesterol	194 $\pm$ 5.33	219.19 $\pm$ 9.30,	<0.001
Triglycerides	198.57 $\pm$ 13	249.07 $\pm$ 19.38	<0.001
HDL	42.73 $\pm$ 3.60	37.69 $\pm$ 5.73	<0.001
LDL	109.89 $\pm$ 10.60	115.40 $\pm$ 16.73	<0.05
VLDL	45.55 $\pm$ 4.39	53.83 $\pm$ 4.85	<0.001

## Discussion

The study's purpose was to compare the lipid profiles of CRF patients on conservative therapy (Group A) and those on hemodialysis (Group B). In this study, the average age of the patients was 49.10, which was similar to Manpreet Saini *et al*'s study.<sup>[6]</sup> Our study found that males and females made up 61.25 % and 38.75 % of the population, which is similar to Rajani and Srinivas<sup>[7]</sup>, who found that males and females made up 68 % and 32 % of the population, respectively. Males made up the majority of the participants in both groups.

Total cholesterol and LDL were found to be higher in patients on hemodialysis than in those receiving conservative treatment in our study. Low HDL levels have been identified as a risk factor for the occurrence and development of CKD.<sup>[8]</sup> VLDL cholesterol levels were found to be greater in CRF patients on hemodialysis, while HDL cholesterol levels were found to be lower. Mikolasevic<sup>1</sup> found similar results.<sup>[9]</sup> The delayed breakdown of VLDL results in higher VLDL concentrations. When compared to conservative therapy, TGs are reported to be high in CRF patients on hemodialysis which was supported by Zolezzi *et al*<sup>[10]</sup>. LDL levels in CKD patients on hemodialysis were shown to be higher in our study than in CRF patients on conservative therapy, which is similar to Singh's study<sup>[11]</sup>. The fact that uremic individuals have lower amounts of apolipoprotein AI and AII could be one factor contributing to low HDL levels. Increased activity of cholesterol ester and decreased activity of lecithin-cholesterol acyltransferase (LCAT) enhance the transfer of cholesterol esters from HDL to TG-rich lipoproteins, lowering HDL cholesterol. Furthermore, lower HDL protective capacity against oxidative stress may be the cause of decreased HDL in hemodialysis patients due

to poor reverse cholesterol transfer. Total cholesterol levels were observed to be higher in CKD patients on hemodialysis in our study, which is consistent with Rajani and Srinivas's findings.<sup>[7]</sup> However, hypercholesterolemia was not observed in the majority of the studies. An increase in cholesterol-containing lipid fractions could be the cause of higher total cholesterol levels in our study.

The study's limitations include a small number of participants and a lack of solid data on the impact of gender on the lipid profile of CKD patients on hemodialysis and conservative therapy.

## Conclusion

When CKD patients on hemodialysis were compared to CKD patients on conservative therapy, there had been a decrease in HDL levels and an increase in total cholesterol, TG, LDL, and VLDL levels. Changes in lipid and carbohydrate metabolism, combined with the advancement of CKD stages, can raise the risk of atherosclerosis, resulting in a poor prognosis and a higher disease death rate. This stresses the importance of routine lipid profile monitoring and management in CKD patients, especially at the early stages, to avoid cardiovascular risk. Despite several research on lipid profile in CKD patients, the trend of lipoprotein pattern in CKD patients on hemodialysis remains unclear, and it is suggested that multi-centric studies be prioritised in order to provide a conclusive picture of lipid profile pattern in CKD patients.

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