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Research Article

A RESEARCH STUDY TO ANALYZE THE NON-DIABETIC CHRONIC KIDNEY DISEASE PATIENT'S LIPID PROFILE WITH RESPECT TO INCREASED VLDL AND TRIGLYCERIDE CONCENTRATIONS

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Abstract:

Objective: This research aimed to analyze the lipid profile in non-diabetic chronic kidney disease patients.

Materials and Methods: This research was carried out at Allied Hospital, Faisalabad from February 2017 to July 2017 on a total of fifty non-diabetic patients having chronic kidney disease. The research sample included both male and female gender. Patients underwent a physical examination and detailed history for disease diagnosis with the support of sociological and biochemical evidence.

Results: In the total sample of fifty patients twenty-seven patients showed an abnormal lipid profile and remaining twenty-three patients showed a normal lipid profile. Both patients and controls showed average value of cholesterol was respectively (202 ± 48.3) mg/dl and (186 ± 26.3) mg/dl (P -Value = 0.25). This variation in both groups was not significant. The value of Triglycerides in the CKD patients was significantly high than controls with respective (166 ± 71.8) mg/dl and (97.17 ± 17.1) mg/dl with a respective P -Value of (< 0.001). Which is higher in a significant way. The value of HDL in the patients of CKD was low than controls with respective values of (36.96 ± 6.77) and (51.0 ± 10.24) with a significant P -Value of (< 0.001) which is statistically significant. The values of LDL are more in patients than controls with respective values of (121 ± 46.51) and (116.4 ± 29.2) (P -Value 0.21) which is not significant. VLDL values were also higher in the patients than controls with respective values of (33.18 ± 14.35) and (19.4 ± 3.4) (P -Value < 0.001) which was significantly high. A significant reduced TC/HDL proportion in patients than controls with respective values of (0.19 ± 0.06) and (0.3 ± 0.08) which was high significantly (P -Value < 0.001).

Conclusion: VLDL and triglyceride increased concentrations caused CVD abnormalities in the patients of CKD. A significant decrease in the HDL and total cholesterol proportions are an indicator of coronary artery diseases in all CKD patients. It is also a primary contributor to increased atherogenesis factors. In the end, the lipid profile disorders increase kidney disease progression and also abnormalities in chronic kidney disease accelerate the progression of the kidney disease and may also lead to atherosclerosis. Therefore, it is important to treat and detect the onset of hyperlipidemia in CKD patients.

Keywords: CKD (Chronic Kidney Disease), VLDL (Very Low-Density Lipoprotein), LDL (Low-Density Lipoprotein), HDL (High-Density Lipoprotein) and TL (Total Cholesterol).

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INTRODUCTION:

CKD is a combination of various pathophysiologic processes spectrums which are associated with regular and progressive decline of the GFR (Glomerular Filtration Rate) and abnormal functioning of the kidney [1]. Chronic renal failure refers to a significant process of irreversible decrease in the number of the nephron and is also corresponds to the stages of CKD (3 – 51). ESRD and Mild to moderate CKD patients primarily face mortality because of CVD [2]. Another known risk is of Dyslipidemia which is well-established. It shows LDL and total cholesterol independently predicts the onset of mortality and CVD [3]. An abnormal lipoprotein and lipid concentrations among CKD patients may also cause higher risks of lipoprotein-alpha [Lp (a)] and atherosclerosis, apolipoproteins and lipoproteins composition can be an indicator of increased index of atherogenic status [4]. It is suggested in various prospective research studies that lipid abnormalities presented in CKD patients are hypertriglyceridemia. Increased level of triglyceride is because of an impaired LPL (Lipoprotein Lipase) and various uremic 'toxins' direct inhibitory effect on the involved enzymes in the lipid metabolism, which represent vital pathophysiological mechanisms that underlay the hypertriglyceridemia development in renal failure cases [5].

MATERIAL AND METHODS:

This research was carried out at Allied Hospital, Faisalabad from February 2017 to July 2017 on a total of fifty non-diabetic patients having chronic kidney disease. The research sample included both male and female gender. Patients underwent a physical examination and detailed history for disease diagnosis with the support of sociological and biochemical evidence. We did not include the patients who were diabetic and under the age of twenty years. In this

research control group consisted of twenty-five patients without gender discrimination. Research started after ethical approval of the hospital's ethical committee. Blood samples (5 ml) were analyzed for lipid profile, Serum creatinine, blood urea, serum albumin and total protein in the laboratory. A pre-designed Performa was used for research outcomes. Significant P-Value was ≤ 0.05 . The research analyzed the research outcomes on SPSS software.

RESULTS:

In the total sample of fifty patients, twenty-seven patients showed an abnormal lipid profile and remaining twenty-three patients showed a normal lipid profile. Both patients and controls showed average value of cholesterol was respectively (202 ± 48.3) mg/dl and (186 ± 26.3) mg/dl (P-Value = 0.25). This variation in both groups was not significant. The value of Triglycerides in the CKD patients was significantly high than controls with respective (166 ± 71.8) mg/dl and (97.17 ± 17.1) mg/dl with a respective P-Value of (< 0.001). Which is higher in a significant way. The value of HDL in the patients of CKD was low than controls with respective values of (36.96 ± 6.77) and (51.0 ± 10.24) with a significant P-Value of (< 0.001) which is statistically significant. The values of LDL are more in patients than controls with respective values of (121 ± 46.51) and (116.4 ± 29.2) (P-Value 0.21) which is not significant. VLDL values were also higher in the patients than controls with respective values of (33.18 ± 14.35) and (19.4 ± 3.4) (P-Value < 0.001) which was significantly high. A significant reduced TC/HDL proportion in patients than controls with respective values of (0.19 ± 0.06) and (0.3 ± 0.08) which was high significantly (P-Value < 0.001).

Detailed outcomes of the biochemical profile of CKD patients and controls are given in the given tabular and graphical data.

Table – I: Biochemical data in control and kidney disease patients

Groups	Blood Urea		Serum Creatinine		Total Protein		Serum Albumin	
	Mean	\pm SD	Mean	\pm SD	Mean	\pm SD	Mean	\pm SD
Controls (25)	13.88	4.52	0.73	0.31	6.8	0.4	4.2	0.3
Patients (50)	201.42	82.87	9.54	2.96	5.9	0.7	3.4	0.4
T-Value	11.26		14.79		5.94		8.82	
P-Value	< 0.001		< 0.001		< 0.01		< 0.001	

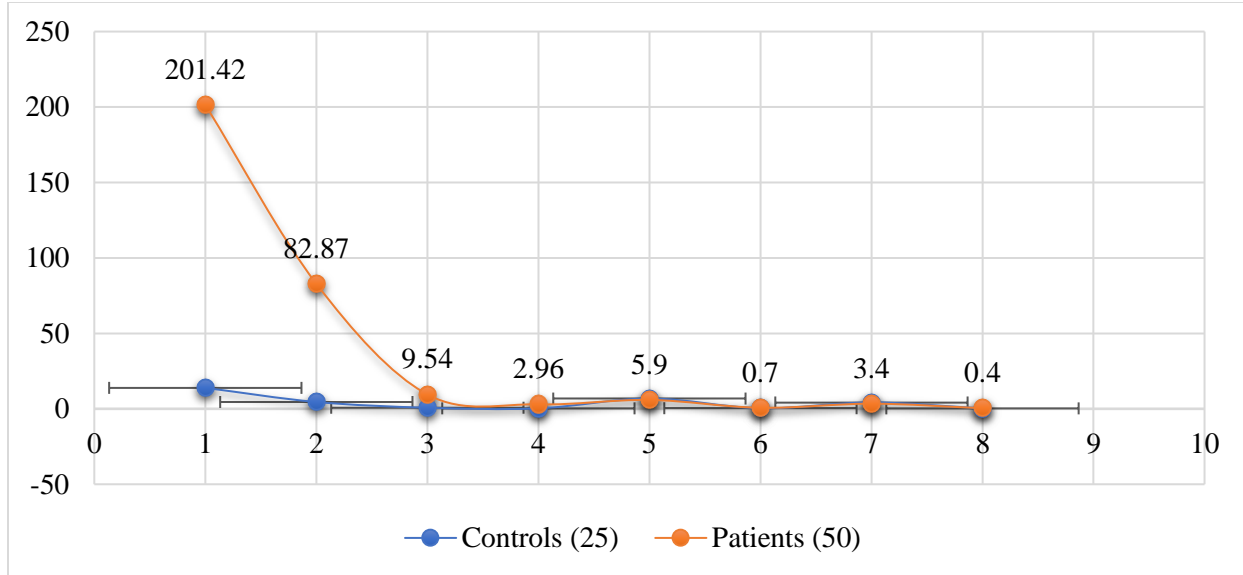
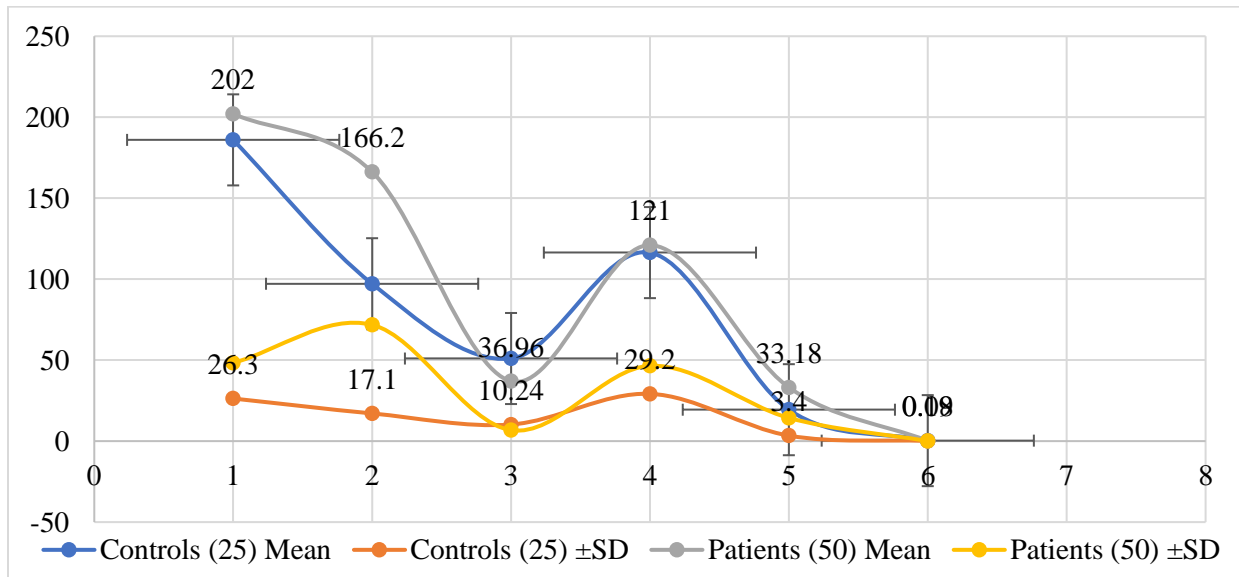


Table – II: Biochemical (lipid profile) data in controls and kidney disease patients

Groups	Controls (25)		Patients (50)		T-Value	P-Value
	Mean	±SD	Mean	±SD		
Total Cholesterol	186	26.3	202	48.3	1.54	0.12
Triglycerides	97.17	17.1	166.2	71.8	4.71	< 0.001
HDLc	51	10.24	36.96	6.77	7.09	< 0.001
LDLc	116.4	29.2	121	46.51	0.44	0.65
VLDLc	19.4	3.4	33.18	14.35	4.72	< 0.001
HDL/TC	0.3	0.08	0.19	0.06	6.67	< 0.001



DISCUSSION:

The outcomes reported in the CKD patients as observed in the lipid profile reflects that lipid profile has serious deviations in patients as compared to controls. We also reported increased triglycerides in the patients than controls with a significantly higher P-Value of (< 0.001). According to Alaupovic P. and Attman P.O. hypertriglyceridemia is repeated abnormality of lipid plasma in adult cases and children diagnosed with renal failure [6]. The correlation between atherosclerotic heart disease and hypertriglyceridemia is not very much clear at the moment; few consider it as a risk; whereas, others do not [7 – 8]. There was no statistical significance of the values of cholesterol among patients than controls. According to Gerald Appel, the cholesterol values are low among CKD patients [9]. According to Anderson et al. the onset of hypercholesterolemia was found in twenty percent of the patients [10]. HDL cholesterol was decreased among patients in comparison with controls (P – Value < 0.001). Goldberg also made a comparison of reduced concentrations of HDL among controls and patients [11]. The research of Aviram and Rapoport reflects no HDL concentration reduction among CKD patients [12]. Fuh MMT reported a decreased concentration of HDL cholesterol plasma in CKD patients which has an association with a reduction in the total synthetic rate of HDL/ apo AI and fractional catabolic rate [13].

A marginal increase in the serum total cholesterol among CKD patients was observed than controls which not significant statistically (P = 0.25). Shah reflected in his research that there was no significant variation in the total cholesterol levels [14]. A significant increase in the levels of VLDL among CKD patients than controls was also reported (P < 0.001). According to Cheung, very low-density lipoproteins levels increased [15]. There was a marginal increase in the level of LDL among patients in comparison with controls which was not -significant as well (P = 0.21). Anderson reflected an increase in the levels of LDL [10]. Gerald Appel reflected decreased or normal levels of LDL [9].

CONCLUSION:

VLDL and triglyceride increased concentrations caused CVD abnormalities in the patients of CKD. A significant decrease in the HDL and total cholesterol proportions are an indicator of coronary artery diseases in all CKD patients. It is also a primary contributor to increased atherogenesis factors. In the end, the lipid profile disorders increase kidney disease progression and also abnormalities in chronic kidney disease accelerate the progression of the kidney

disease and may also lead to atherosclerosis. Therefore, it is important to treat and detect the onset of hyperlipidemia in CKD patients.

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