

Assessment of abnormalities in lipid profiles of patients with chronic kidney disease from different hospitals of Lahore, Pakistan: A case control study

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Abstract

The current study aimed to evaluate lipid profile parameters in patients with chronic kidney disease (CKD). This case-control study was conducted at the Zoology Department of Lahore College for Women University, Lahore, Pakistan, from September 2016 to June 2017 and analysed lipid profiles of patients with CKD attending different hospitals of Lahore. Of the randomly collected 100 blood samples, 50 were healthy, while the remaining 50 were patients with CKD. Lipid profile parameters were analysed using Hitachi 704 Analyser. For data analysis Chi-square test was used by means of SSPS 17.

Results showed that all the parameters, including high density lipoprotein, triglycerides and low density lipoprotein were considerably altered in patients with CKD as compared to the control group. The values of triglycerides and LDL parameters were higher, while HDL cholesterol was lower in patients with CKD as compared to controls.

Keywords: Chronic kidney disease, Lipid profile, HDL cholesterol, Triglycerides, LDL cholesterol.

DOI: <http://doi.org/10.5455/JPM.28455>

Introduction

Serum lipid profile is a routine test to measure the health status of patients with different kidney problems. There are three fundamental parameters of this test, namely HDL cholesterol, LDL cholesterol and triglycerides. It is generally done on a fasting blood specimen.¹ Chronic kidney disease (CKD) is now a universal health problem affecting millions of people every year.² Reduction or loss of functioning of nephron may also cause chronic kidney disease.³ Chronic kidney disease is the aberration in the structure or function of the kidney that has been present for three or more months, and is determined by some laboratory test. Kidney disease is usually asymptomatic and is often not diagnosed until it has progressed to late

stages.⁴ It is evident from various studies that chronic kidney disease is associated with poor outcome of treatment.⁵

The most common complication in patients of chronic renal failure is dyslipidaemia. Recent studies have revealed that patients with cardiovascular problems have dyslipidaemia.⁶ In a patient with end stage renal disease, the major cause of death is cardiovascular disease (CVD) the prevalence of which is much higher in haemodialysis patients than in post transplantation patients.⁷ Dyslipidaemia may also alters renal physiology.⁸ Usually the abnormal lipid profile may raise the level of triglycerides and low-density lipoprotein.⁹ The unevenness between lipoprotein synthesis and degradation in prolonged renal disease results in marked dyslipidaemia. Uraemic patients have increased serum levels of triglycerides and lipoprotein and this increased level of lipid may contribute to increased cardiovascular risk.¹⁰

In Pakistan, reports on lipid profile parameters are available but very little work has been done to detect the lipid profile among renal failure patients in Lahore. Keeping in mind the different results of earlier research on the subject, the present study was designed to examine lipid profile among renal failure patients, particularly in Lahore.

Patients and Methods

The present study was a case-control study conducted to assess the lipid profile in patients with chronic kidney disease (CKD). The selected 100 individuals included 50 patients with recognised CKD as case subjects, while the other 50 were apparently healthy and were taken as control volunteers with no evidence of CKD (healthy controls). Ethical approval was taken for the study that ran from September 2016 to June 2017.

Inclusion and Exclusion criteria

- ◆ Patients/respondents who gave consent were selected for lipid profiling on at least nine hours of fasting before venipuncture.
- ◆ Selected kidney patients on dialysis with age between

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20 to 60 years were selected for the study.

- ♦ Average duration of disease in patients suffering from CKD was about two months to 15 years.
- ♦ Healthy controls who did not have diabetes, high blood pressure or any kind of kidney or liver disease.

A questionnaire survey was conducted to determine the general health status of kidney patients and identification of risk factors for renal disease in both males and females. Blood samples were collected from the nephrology departments of three hospitals in Lahore — Jinnah Hospital, Sir Ganga Ram Hospital and Services Hospital — and shifted to the parasitological research laboratory of Zoology Department, Lahore College for Women University, Lahore, for analysis.

Initially a large number of people were given survey questionnaires and preliminary visits were done but due to time constraints and depending upon the availability and preservation of samples, the sample size was reduced to 50 patients as case subjects and 50 as healthy controls, after taking their consent.

The questionnaire was divided into four sections: a) Personal profile b) Socioeconomic status c) General health status and d) Remarks. The basic purpose of the questionnaire was to obtain information about the kidney patient's general, financial and health condition which helped to carry out the present research work systematically and to analyse the results scientifically.

All the subjects were evaluated for fasting lipid profile. About 5ml of fasting blood sample was taken from respondents by a trained technician, which was used to estimate the level of serum triglyceride, HDL and LDL. Blood sample was allowed to stand for 45 minutes at room temperature to allow complete clotting and clot retraction. During the clotting period, collection tubes were sealed to avoid any contamination. Blood samples were equilibrated to room temperature before serum separation. Tubes were centrifuged at 3,000-3,500 rpm for 10 to 15 minutes on centrifuge machine. The supernatant light straw coloured serum was separated. LDL cholesterol, triglycerides and HDL cholesterol analyses were performed on a Hitachi 704 Analyser. Qualitative data, collected with the help of the questionnaire, was tabulated and transformed into quantitative

data. Averages and percentages were calculated. The results of this test were tabulated and presented as percentage prevalence. Percentage prevalence was compared on the basis of gender, age and different lipid parameters. Descriptive statistics were achieved by using mean, standard deviation and standard error mean using SPSS 17. Chi square test was used to compare percentage prevalence among various parameters. $p < 0.05$ was considered significant for different parameters.

Results

For the present research personal data, socioeconomic status and general health assessment of study subjects (both males and females) was collected through a questionnaire to identify risk factors for kidney disease. The results of the questionnaire showed that most of the subjects who had risk factors of kidney disease were women of older age. They also lacked education and belonged to poor socioeconomic class and had various health problems, such as overweight, blood pressure and heart problem.

Only three parameters of lipid profile were observed in this study i.e. high density lipoproteins, triglycerides and low density lipoproteins. In the present study, the results showed that triglycerides, HDL-C, LDL-C of CKD patients were altered as compared with the control group. It was revealed that CKD patients had high level of triglycerides and LDL — 142 ± 63 mg/dL and 119 ± 40.3 mg/dL,

Table-1: Detail of parameters of lipid profile (Mean+SEM) among case and control subjects.

Parameters	Case (mg/dl)	Control (mg/dl)	Chi-square	p value
Triglycerides	142 ± 63	139 ± 80	14.8	$P = 0.08$
HDL	38.6 ± 8.5	42.86 ± 13.32	8.5	$*P = 0.03$
LDL	119 ± 40.3	115 ± 39.19	39.19	$P = 0.12$

* < 0.05 .

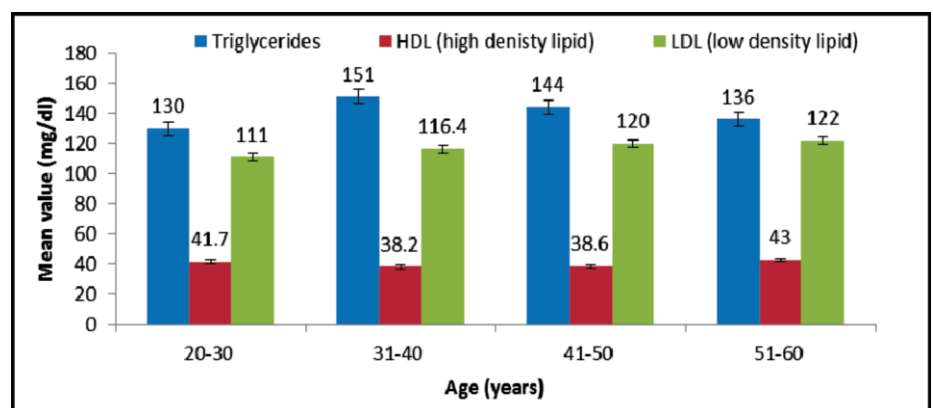


Figure-1: Graph showing mean for different parameters for lipid profile among different age groups.

respectively — and low value of HDL (38.6 ± 8.5 mg/dL) as compared to control subjects whose triglyceride, LDL and HDL readings were 139 ± 80 mg/dL, 115 ± 39.19 mg/dL and 42.86 ± 13.32 mg/dL, respectively.

Age wise comparison was also made for these three parameters among the study subjects. The first group consisted of participants between the ages 20 to 30 years, the second group comprised patients between the age of 31 to 40 years, the third group was of 41-50 year olds and the fourth group represented 51-60 year old subjects. For triglycerides the highest mean value of 151 ± 1.2 mg/dL was recorded in subjects of 31-40 years followed by subjects of 41-50 years with a mean value of 144 ± 1.3 mg/dL and subjects of 51-60 years with a mean value of 136 ± 1.2 mg/dL. Whereas significantly lower value of 130 ± 1.3 mg/dL was obtained for triglycerides in subjects aged 20-30 years. The average mean of LDL at age 20-30 years was 111 ± 1.2 mg/dL in of subjects, for 31-40 years was 116.4 ± 1.1 mg/dL mg/dL in of subjects, at age of 41-50 years it was 120 ± 1.3 mg/dL in of subjects. While the highest mean value of 122 ± 1.1 mg/dL was found in of study subjects for LDL. The mean levels of HDL 41.7 ± 1.2 mg/dL, 38.2 ± 1.3 mg/dL, 38.6 ± 1.0 mg/dL and 43 ± 1.1 mg/dL were computed for the age group of 20-30 years, 31-40 years, 41-50 years and 51-60 years, respectively. The data showed that LDL continuously increased with age while triglycerides and HDL were randomly increasing with age.

Conclusion

The present study concluded that the value of triglycerides and LDL in patients with CKD was higher as

compared to the healthy subjects while HDL, that is good cholesterol, had low values in CKD patients as compared to the healthy participants, which can cause hypertension, increased atherosclerosis and cardiovascular problems.

Disclaimer: None to declare.

Conflict of Interest: None to declare.

Funding Disclosure: None to declare.

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