ORIGINAL ARTICLE

Frequency of Dyslipidemia in Chronic Kidney disease patients presenting at Bahawal Victoria Hospital, Bahawalpur

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ABSTRACT

Aim: To determine the frequency of dyslipidemia in chronic kidney disease patients presenting at Bahawal Victoria Hospital, Bahawalpur.
Methods: This cross sectional study was conducted at Department of Medicine, Bahawal Victoria Hospital, Bahawalpur from April 2019 to October 2019 over the period of 6 months. Total 137 patients with chronic kidney disease having age 20-60 years either male or female, on hemodialysis at least 1 time/week and duration of CKD >3 months were selected for this study. Dyslipidemia was assessed in selected patients.
Results: Age range in this study was from 20 to 60 years with mean age of 41.54 ± 9.07 years, mean duration of disease was 5.80 ± 2.26 months and mean BMI was 27.53 ± 3.03 kg/m^2. Out of 137 patients of CKD, dyslipidemia was found in 87 (63.50%) patients. Dyslipidemia was found in 32 (42.67%) patients of age group 20-40 years and 55 (88.71%) patients of age group 41-60 years. Statistically significant association of dyslipidemia with age group was seen with p value 0.0001. Dyslipidemia was seen in 42 (55.26%) male patients and 45 (73.77%) female patients. Association of dyslipidemia with gender was statistically significant with p value 0.025.
Conclusion: This study concluded that frequency of dyslipidemia in chronic kidney disease patients is very high. So, we recommend that early screening of dyslipidemia in these particular patients should be done so that some preventive measures can be taken in these particular patients for reducing the progression of the disease which in turn reduce the morbidity and mortality of our patients.
Keywords: chronic kidney disease, dyslipidemia, cholesterol.

INTRODUCTION

Globally chronic kidney (CKD) disease is one of the major health problems. Global prevalence of CKD is 8-16%[1]. In Indian population, prevalence of CKD is 17.2% and 6% cases has stage III or above CKD, estimated by SEEK study. [2] Due to lack of central registry, true incidence and prevalence of ESRD in Pakistan is not known. In one study conducted at Karachi in year 2011, 25.3% patients were found decreased glomerular filtration rate (GFR), of which 5% patients found with moderate CKD.[3]In one study by Kazmi et al conducted in 2007 which consisted on 1023 patients, reported frequency of CKD as 14%[4]. CKD has strong association with dyslipidemia, which comprised of elevated serum triglycerides levels and low serum HDL levels. Serum LDL levels are not generally elevated, however, proteinuria has correlation with serum triglycerides levels and serum cholesterol levels[5]. CKD leads to a down regulation of lipoprotein lipase and the LDL-receptor, and increased triglycerides in CKD are due to delayed catabolism of triglyceride rich lipoproteins, with no differences in production rate[6,7]. CKD is strongly associated with increased levels of apoB/apoA-I and decreased levels of apoA-I[8]. It is also hypothesized that kidney damage is caused by dyslipidemia and in renal failure, dyslipidemia plays and important role[9]. As CKD progresses the dyslipidemia often worsens. In one survey, there was an increase (45.5-67.8% in CKD stage I-IV) noticed in frequency of dyslipidemia. [10]A study was reported frequency of dyslipidemia as 84% in cases of CKD.[11] As the dyslipidemia in chronic kidney disease patients is associated with high morbidity and mortality and on searching the literature, we have found no local study on this topic, so the rationale of this study was to find out the frequency of dyslipidemia in CKD patients in local population. As there are ethnic and geographic variations in CKD and dyslipidemia prevalence, so we had decided to conduct this study in our population. The findings of present study will not only provide us with the local data of the disease but will also help the clinicians for early screening of dyslipidemia in these particular patients, so that some preventive measures can be taken in these particular patients for reducing the progression of the disease which in turn reduce the morbidity and mortality of our patients.

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OPERATIONAL DEFINITIONS:

- **Chronic Kidney Disease:** It was labeled if serum creatinine is above 1.3mg/dl on laboratory examination for last 12 weeks. Any of these Chronic Kidney Disease Stages was included:
- Stage 1: GFR > 90 ml/min (on DTPA renal scan).
- Stage 2: GFR between 60-90 ml/min (on DTPA renal scan).
- Stage 3: GFR between 30-59 ml/min (on DTPA renal scan).
- Stage 4: GFR between 15-29 ml/min (on DTPA renal scan).
- Stage 5: GFR < 15 ml/min (on DTPA renal scan).

- **Dyslipidemia:** was considered as yes if any one of the followings was present:
- Total Cholesterol level >200mg/dl.
- Triglyceride level >150mg/dl.
- High density lipoprotein (HDL) <40mg/dl in males and <50 mg/dl in females.
- Low density lipoprotein (LDL) >130 mg/dl.
- **Hypertension:** all known hypertensive patients for last 2 years as assessed on history and taking treatment and properly controlled blood pressure.
- **Diabetes mellitus:** all known diabetic patients for last 2 years as assessed on history and taking treatment and properly controlled.
- **BMI:** was calculated by following formula; **BMI = weight in kilograms / height in meters^2**as measured by spadiometer and >27 was taken as obese and ≤27 as non-obese.
- **Socioeconomic status;** It was taken as follows;
- **Poor;** Those with family income less than or equal to 12000/--
- **Middle income;** having family income ranging from Rs. 12001 to 35000 rupees.
- **Rich;** with family income more than Rs. 35000.

MATERIAL AND METHODS

This cross sectional study was conducted at Department of Medicine, Bahawal Victoria Hospital, Bahawalpur from April 2019 to October 2019 over the period of 6 months. Total 137 patients with chronic kidney disease having age 20-60 years either male or female, on hemodialysis of at least 1 time/week and duration of CKD >3 months were selected for this study.

Patients taking lipid lowering drugs as assessed on history, patients suffering from chronic liver disease (assessed on history and medical record, patients with history of ischemic heart disease (assessed on history and medical record) were excluded from the study. Study was approved by the ethical committee and written informed consent was taken from every patient.

Five ml blood sample of each patient was taken and sent to the institutional pathology laboratory for measurement of lipid profile and presence or absence of dyslipidemia as per-operational definition was noted. All this data including the demographic data (age, gender, BMI) was recorded on a specially designed proforma.

SPSS version 19 was used to analyzed the data. Age, duration of disease and BMI were presented as mean and standard deviation (SD). Frequencies and percentages were calculated for categorical variables like gender, stage of CKD (1/2/3/4/5), obesity (Non-obese/Obese) and dyslipidemia (present/absent).

Effect modifiers like age, gender, duration of disease, obesity and stage of CKD (1/2/3/4/5) were controlled by stratification. Post stratification Chi square test was applied. P-value ≤ 0.05 was considered as significant.

RESULTS

Age range in this study was from 20 to 60 years with mean age of 41.54 ± 9.07 years, mean duration of disease was 5.80 ± 2.26 months and mean BMI was 27.53 ± 3.03 kg/m^2. Out of 137 patients of CKD, dyslipidemia was found in 87 (63.50%) patients. (Fig. 1)

Selected patients were divided into two equal groups i.e. age group 20-40 years and age group 41-60 years. Age group 20-40 years was consisted on 75 (74.74%) patients while age group 41-60 years was consisted on 62 (45.26%) patients. Dyslipidemia was found in 32 (42.67%) patients of age group 20-40 years and 55 (88.71%) patients of age group 41-60 years. Statistically significant association of dyslipidemia with age group was seen with p value 0.0001. (Table 1)

Male patients were 76 (55.47%) and female patients were 61 (44.53%). Dyslipidemia was seen in 42 (55.26%) male patients while 45 (73.77%) female patients. Association of dyslipidemia with gender was statistically significant with p value 0.025. (Table 2)

Stage I CKD was seen in 19 (13.87%) patients followed by stage II 39 (28.47%) patients, stage III 39 (28.47%) patients, stage IV 32 (23.36%) patients and stage V in 8 (5.84%) patients. Dyslipidemia was found in 14 (73.68%) patients, 24 (61.54%) patients, 27 (69.23%) patients, 18 (56.25%) patients and in 4 (50%) patients respectively in stage I, II, III, IV and V CKD. But the association of dyslipidemia with stage of CKD was not statistically significant with p value 0.745. (Table 3)

In 99 (72.26%) patients, duration of CKD was 3-6 months while in 38 (27.74%) patients duration of CKD was >6months. Dyslipidemia was noted in 64 (64.65%) patients of 3-6 months duration of CKS group and in 23 (60.53%) patients of >6 months of duration of CKD group. No association between duration of CKD and dyslipidemia was noted with p value 0.654. (Table 4)

Total 70 (51.09%) patients were non-obese and 67 (48.91%) patients were obese. Dyslipidemia was found in 41 (58.57%) non-obese patients while in 46 (68.66%) obese patients. Association of obesity with dyslipidemia was not statistically significant with p value 0.220. (Table 5)

Figure 1: Frequency of dyslipidemia (n=137).

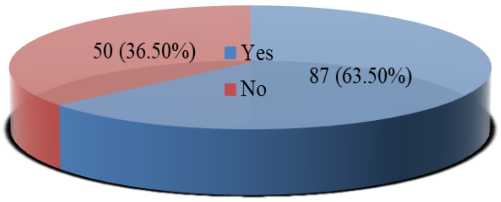

Table 1: Stratification of dyslipidemia with respect to age groups.

Age (years)	Dyslipidemia		Total	p-value
	Yes (%)	No (%)		
20-40	32 (42.67)	43 (57.33)	75 (74.74)	
41-60	55 (88.71)	07 (11.29)	62 (45.26)	0.0001
Total	87 (63.50)	50 (36.50)	137	

Table 2: Stratification of dyslipidemia with respect to gender.

Gender	Dyslipidemia		Total	p-value
	Yes (%)	Yes (%)		
Male	42 (55.26)	34 (44.74)	76 (55.47)	
Female	45 (73.77)	16 (26.23)	61 (44.53)	0.025
Total	87 (63.50)	50 (36.50)	137	

Table 3: Stratification of dyslipidemia with respect to stage of CKD.

Stage	Dyslipidemia		Total	p-value
	Yes (%)	Yes (%)		
I	14 (73.68)	05 (26.32)	19 (13.87)	0.745
II	24 (61.54)	15 (38.46)	39 (28.47)	
III	27 (69.23)	12 (30.77)	39 (28.47)	
IV	18 (56.25)	14 (43.75)	32 (23.36)	
V	04 (50)	04 (50)	8 (5.84)	
Total	87 (63.50)	50 (36.50)	137	

Table 4: Stratification of dyslipidemia with respect to duration of CKD.

Duration (months)	Dyslipidemia		Total	p-value
	Yes (%)	Yes (%)		
3-6 months	64 (64.65)	35 (35.35)	99 (72.26)	0.654
>6 months	23 (60.53)	15 (39.47)	38 (27.74)	
Total	87 (63.50)	50 (36.50)	137	

Table 5: Stratification of dyslipidemia with respect to obesity.

Obesity	Dyslipidemia		Total	p-value
	Yes (%)	Yes (%)		
Non-obese	41 (58.57)	29 (41.43)	70 (51.09)	0.220
Obese	46 (68.66)	21 (31.34)	67 (48.91)	
Total	87 (63.50)	50 (36.50)	137	

DISCUSSION

Present study was planned to fond out the frequency of dyslipidemia in cases of CKD. In this study age range was 20-60 years and mean age of the patients was 41.54 ± 9.07 years. Majority of the patients 75 (54.74%) were between 20-40 years. Out of 137 patients, 76 (55.47%) were males and 61 (44.53%) were females with male to female ratio 1.25:1.In our study, frequency of dyslipidemia in CKD patients was 87 (63.50%). In one study by Ganta et al, [12] dyslipidemia was found in 65% of CKD.

A study among Nepalese population with CKD recorded a higher prevalence of dyslipidemia among CKD patients when compared to the non-CKD control group, and the difference was statistically significant.[13]A study by Saroj K et al reported a prevalence of hypertriglyceridemia was 36.6% in CKD patients.[8]In one study by Anderson et al, frequency of hypercholesteremia was 20% in CKD patients[14].

Hypercholesteremia is a significant risk factor for CAD. But, Gerald Appel et al reported low levels of cholesterol in CKD cases[15]. Goldberg et al reported decrease in HDL concentrations in cases of CKD as compared to control group, in contrast to studies of Rapoport and Aviramreported no decrease in HDL concentrations in CKD patients.[16,17]In another study, dyslipidemia was found to be 84.0% patients which is little higher than our study. [18]Dyslipidemia is common in patients with CKD, and the lipid profile varies widely depending on the level of kidney function and the degree of proteinuria.[19]In one study, higher LDL-C levels was found in 70% CKD patients[20]. Similarly higher level of LDL-C was observed in 90% patients and higher cholesterol levels was seen in 80% CKD patients in some studies[21-23]. In another study, total 1000 CKD patients were studied, of which only 20% patients found with normal lipids[24]. In another study, frequency of dyslipidemia was 82% in CKD patients, all the patients were on dialysis[25].

CONCLUSION

This study concluded that frequency of dyslipidemia in chronic kidney disease patients is very high. So, we recommend that early screening of dyslipidemia in these particular patients should be done so that some preventive measures can be taken in these particular patients for reducing the progression of the disease which in turn reduce the morbidity and mortality of our patients.

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