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A OBSERVATIONAL STUDY OF ANAEMIA AND DYSLIPIDEMIA IN RENAL FAILURE PATIENTS IN TERTIARY CARE HOSPITAL

General Medicine

Yadavendra C Reddy* Associate Professor Department of Medicine, ESIC Medical College, Hyderabad, Telangana, India. *Corresponding Author

Afreen Begum House Surgeon, ESIC Medical College, Sanathnagar

ABSTRACT

BACKGROUND: Chronic kidney disease (CKD) is associated with a dyslipidemia comprising high triglycerides, low HDL-cholesterol and altered lipoprotein composition.the present study is aimed at studying the variation in lipid levels and haemoglobin levels in renal failure patients.
METHODS: This Prospective Observational study was done from june 2021 to november 2021 in tertiary care hospital.. A total of 50 cases male and female were studied based on inclusion and exclusion criteria. All patients were done routine investigations.all patients were sent lipid profile.patients renal failure was assessed crudely by taking creatinine values.this was confirmed by applying cockraft gault formula.the patients haemoglobin levels were assessed and confirmed by doing peripheral smear The study was carried out in all patients fulfilling the inclusion and exclusion criteria.
RESULTS: A total of 50 patients 26 males and 24 females presented during the study period. In our study there was male preponderance in the ratio 1:1.08.18 patients were in the age group 60-70 years.it was observed that 9 patients had low haemoglobin levels and were in the age group 60-70years. lipid abnormalities were noted LDL increased in22 patients; TGL increased in 41 patients; HDL increased in 11patients.;Total Cholesterol in 36 patients; VLDL increased in 20 patients. 20 patients were in stage 4 ,15 patients were in stage 3,10 patientts in stage 5 of ckd calculated based onn cockroftgault formula.
CONCLUSIONS: It was Observed from the study that anaemia was predominant in older renal failure patients.it was observed that triglycerides were raised in more number of patients followed by total cholesterol.

KEYWORDS

ckd,tgl,ldl,hdl,tc,vldl

INTRODUCTION

Chronic kidney disease(CKD) can be defined as kidney damage for more than or equal to 3 months, as defined by structural or functional abnormalities of kidney, with/ without decrease in glomerular filtration rate, manifested by pathologic abnormalities or markers of kidney damage, including abnormalities in the composition of blood, urine or imaging abnormalities (GFR<60ml/min/1.73m² for 3 months or more with or without kidney damage)[1]. An association between lipid and kidney disease was first noted by Virchow who described fatty degeneration of renal epithelium in Bright's disease in 1860[2]. When the " Lipid Nephrotoxicity Hypothesis" was proposed in 1982, CKD was postulated as being associated with dyslipidemia[3]. Large scale studies in 1990's showed that proteinuria increased in CKD patients with dyslipidemia after 10 years of follow up[4]. A study has evaluated dietary patterns and CKD risk. After more than 6 years of follow up, high fat and high sugar diet was shown to increase the incidence of CKD by 46%[5]. Due to continuous changes in living standards and dietary habits, the incidence of dyslipidemia has increased annually. Dyslipidemia here comprises of elevated triglycerides , low high density lipoprotein (HDL) levels and reduced low density lipoprotein (LDL) levels[6].

DYSLIPIDEMIA IN CKD:

1) HDL dysfunction
2) Decreased Apoprotein-A levels
3) Increased VLDL and triglyceride levels
4) Normal to increased LDL levels
5) Increased oxidised LDL levels

Among human studies relating dyslipidemia to renal outcome, high triglycerides, low HDL and high LDL were significantly associated with the risk of renal dysfunction[7]. In CKD, HDL metabolism is impaired and HDL-3 is not matured to HDL-2 due to lecithin cholesterol acyl transferase(LCAT) deficiency[8].

Notably, in CKD patients, HDL cholesterol dysfunction impair the antioxidant effects leading to increased oxidised LDL cholesterol formation[9]. HDL cholesterol dysfunction with LDL- receptor related protein (LRP) deficiency increases chylomicron remnant and intermediate density lipoprotein (IDL) cholesterol levels, is another factor underlying the formation of small dense LDL (sdLDL) in CKD patients[10].

Hypertriglyceridemia is most commonly seen in early stages of CKD due to both abnormal production and reduced catabolism of triglycerides. Reduced catabolism of triglycerides occurs due to inactivation of lipoprotein lipase (LPL)[11,12]. Increased apolipoprotein C-III/C-II ratio precipitates the inactivation of the LPL, since apolipoprotein C-III is an inactivator for LPL, whereas apolipoprotein C-II is an activator for LPL. Chylomicron remnants and IDL cholesterol accumulate because of the decrease in the catabolism of triglycerides.

Regarding the analysis of the cholesterol level in CKD patients, it is shown that serum cholesterol level is generally normal or below the normal limit[13].

As CKD progresses, the dyslipidemia often worsens. The stages of CKD are stratified by calculating glomerular filtration rate (GFR), which is the gold standard for quantitative index of renal function. The staging is determined by the " KIDNEY DISEASE OUTCOMES QUALITY INITIATIVE (K/DOQI), RIFLE criteria and AKIN criteria guidelines"[14].

On an average, the variations seen in lipid profile in CKD quantified into percentage is as:
Total cholesterol= increased by 35%
Triglycerides= Increased by 65%
HDL= decreased levels by 30%
LDL= Increased by 15%

In an evaluation of 2001-2010, National Health and Nutrition Examination Survey (NHANES), the prevalence of dyslipidemia increased from 45.5% in CKD stage 1 to. 67.8% in CKD stage 4[15].

This study is done here to show the retrospective associations of serum lipid levels with kidney impairment and the abnormalities associated with progression of kidney dysfunction.

METHODS

The present Prospective observational study was done in Department of general medicine in tertiary care hospital from june 2021 to november 2021. A total of 50 cases of renal failure patients were studied during the period based on inclusion and exclusion criteria. All patients were done routine investigations like CBP,Lipid profile,serum eletrolytes . Special investigations like iron studies and peripheral smear were done in all enrolled patients. Patients GFR was approximately calculated based on creatinine values applying cockroftgault formula.

INCLUSION CRITERIA:-

1.all patients with raised creatinine levels 2.

EXCLUSION CRITERIA:-
1.patients less than 12 years 2.pregnant women 3.patients with previous heart ailments 4.patients with previous haematological disorders.5.patients with previous lipid abnormalities.

The statistical software SPASS was used to analyse the data and Microsoft word and excel have been used to generate graphs, figure etc.

RESULTS

Of all the patients 26[52%] were males and 24[48%] were females with male preponderance. The patients with renal failure were more in the age group 60-70 around 18[36%] followed by age group between 50-60 around 16[32%]. Lipid profile was done in all enrolled patients. It was observed that TGL and total cholesterol increased in 41[82%] and 36[72%] patients respectively. LDL in 22[44%], VLDL in 20[40%], and HDL in 11[22%] patients.Anaemia was taken as value less than 8mg/dl.we had 9 patients in the age group of 60-70 years.7 in the age group of 50-60 years.

Table 1 Gender Distribution
In Table 1 there is a depiction of male preponderance with males 26 vs females 24 in the ratio F:M [1:1.08]

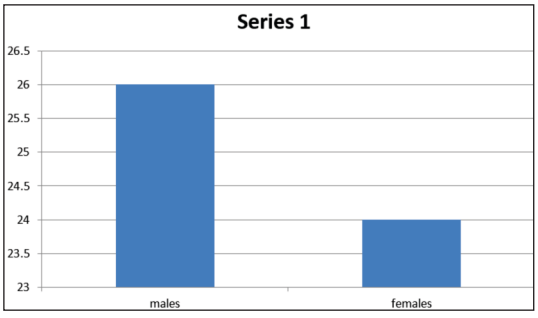


Table 2 Age Group
In table 2 renal failures were more in the age group 60-70yrs followed by patients in the age group between 50-60 years.

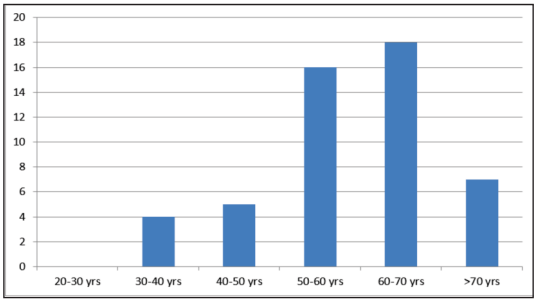


Table 3 In Table 3 the patients with anaemia in ckd[<8mg/dl]

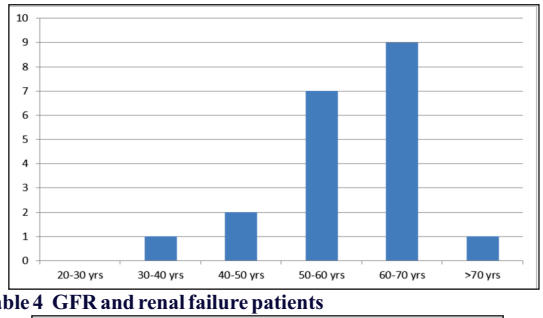


Table 4 GFR and renal failure patients

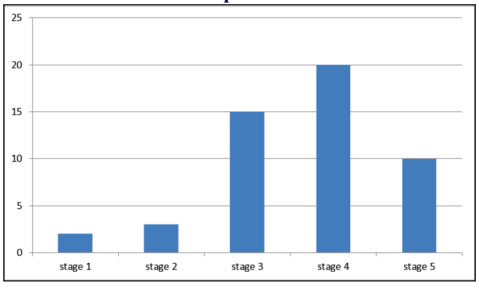
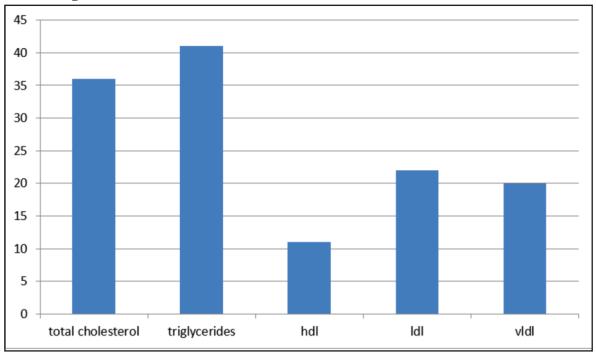


Table 5 In Table 5 the variations in lipid profile in renal failure were depicted.



DISCUSSION :

In our study there were males 26[52%] and females 24[48%] .There was male preponderance in the ratio 1:1.08. in our study the patients were more in the age group 60-70 18[36%] followed by 50-60 16[32%] .The results of the study on the lipid disorders in patients with chronic kidney disease show that there are alterations in the lipid profiles of these patients. In a study by Vaziri N D[16] it was found that the patients had elevated serum triglycerides level, with high levels of VLDL. However, the levels of HDL were reduced.in our study.in our study we had elevated triglycerides in 41[82%],Total cholesterol increased in 36[72%] ldl increased in 22 [44%] vldl increased in 22[44%] hdl decreased in 11[22%] . In a study by Abrass et al[16] he found that the patients with chronic kidney disease had an elevated serum triglyceride level and decreased clearance of chylomicrons and VLDL. Attman P.O, Alaupovic P et al[17] stated that hypertriglyceridemia is the most common plasma lipid abnormality in patients of chronic kidney disease. He found decrease in plasma HDL cholesterol concentration in patients with CKD. It was also reported that decreased HDL was associated with decrease in both the fractional catabolic rate and the total synthetic rate of ApoA1and HDL. Another study conducted by P.O.Attman et al[17] showed no significant change in levels of total cholesterol in patients of CKD.Gerald Appel et al[18] showed increase in very low density lipoproteins (VLDL).Thomas Quasctining et al[19] reported combined hyperlipidemia (elevated total cholesterol and triglycerides) in their study.Chan C M et al [20] studied the lipid abnormalities in patients with renal failure due to nephrotic syndrome and also due to causes other than nephrotic syndrome. He found that the prevalence of hypertriglyceridemia and the elevation of HDL cholesterol were proportional to the severity of renal impairment. He however noticed that the diabetic patients had increased triglycerides and lower HDL suggesting that diabetes itself exacerbated lipid abnormalities. .In a study by Nayak et al[21] and colleagues they found that the lipid profile in diabetic and non diabetic patients with CKD had elevated triglycerides, LDL cholesterol and VLDL. values were similar to previous Indian studies by Sharma et al[22]. In our study we observed patients were anaemic more in the age group 60-70 years 9[18%] 50-60 years 7[14%].we had patients in stage 4 20[40%] stage 3 15[30%] stage 5 10[20%]

CONCLUSION:

In our study there was male preponderance in the renal failure patients.the patients with anaemia were more in the older age group.Lipid abnormalities were more in the older age group.we observed there was increase in triglycerides and total cholesterol in renal failure patients.it was observed that patients in stage3 and 4 had lipid abnormalities more than other patients.

DECLARATIONS

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Conflict of interest: *none*
Ethical approval: *approved*

REFERENCES

[1] Am J Kidney. KDOQI clinical practice guidelines for chronic kidney disease: evaluation, classification and stratification.Dis 2002,39.
[2] Gokal R Khanna, Raymond T, Norph KD. Outcome in Patients on continuous ambulatory peritoneal dialysis and hemodialysis.
[3] Moorhead JF, Chan MK, El Nahas M, et al. Lipid Nephrotoxicity in chronic progressive glomerular and tubulointerstitial disease. Lancet. 1982;2:1309-11.
[4] Yamagata K, Ishida K, Sairenchi T, et al. Risk factors for CKD in community based population:a 10 year follow up study. Kidney Int .2007;71:159-66.
[5] Asghari G, Momeran M, Yuzbashian E, et al. Dietary pattern and incidence of CKD among adults: a population based study. 2018;15(1):88.
[6] Committee for Korean Guidelines for management of Dyslipidemia. Korean circ

J.2016;46:275-306.
[7] Schaeffner ES, Kurth T, Curhan GC, Glynn RJ et al(2003). Cholesterol and the risk of renal dysfunction in apparently healthy men. J Am Soc Nephrol 14:2084-2091.
[8] Moradi H, Pahl MV, Elahimehr R, Vaziri ND: Impaired antioxidant activity of HDL in CKD. Transl Res 2009;153: 77-85.
[9] Vaziri ND, Moradi H, Said HM, Kalantar K: Role of HDL dysfunction in ESRD: A double edged sword. J Ren Nutr 2013,23: 203-206.
[10] Vaziri ND: Rate of dyslipidemia in impairment of energy metabolism, oxidative stress, inflammation and CVD in CKD. Clin Exp Nephrol 2014;18:265-268.
[11] Kwan BC, Beddhu S, Cheung AK: Lipoprotein metabolism and lipid management in CKD. J Am Soc Nephrol 2007;1220-1231.
[12] Nitta K: Clinical assessment and management of Dyslipidemia in patients with CKD. Clin exp Nephrol 2012.
[13] Kronenberg F, Beddhu S, Cheung AK: Lipoprotein metabolism and lipid management in chronic kidney disease. J Am Soc Nephrol 2007; 18: 1246–1261.
[14] National kidney Foundation. K/DOQI Clinical practice guidelines for chronic kidney disease: evaluation, classification and stratification: Am J Kidney Dis 2002;39.
[15] US Renal Data System (USRDS): "Chronic kidney disease in adult NHANES population". USRDS annual report.
[16] Vaziri ND, Sato T, Liang K. Molecular mechanisms of altered cholesterol metabolism in focal glomerulosclerosis.Kidney Int 2003;63:1756-63.
[17] Abrass CK. Cellular lipid metabolismand the role of lipids in progressive renal disease. Am J Nephrol 2004;24:46-53.
[18] Attman PO, Samuelsson O, and Alaupovic P. Lipoprotein metabolism and renal failure. Am J Kidney Dis 21: 573–592, 1993
[19] Gerald appel, Jordan J Cohen, John T Harrington, Cheryl J Zusman. Lipid abnormalities in renal disease. Kidney int 1991;39:169-183
[20] Thomas Quaschning, Vera Krane, Thomas Metzger, Christoph Wanner.Abnormalities in uremic Lipoprotein Metabolism and it's impact on cardiovascular disease. Am J kidney dis 2001;38:S14-S19
[21] CM Chan. Hyperlipidemia in chronic kidney disease. Ann AcadMed Singapore 2005;35:31-35
[22] Nayak KC, Saini MS, Singh VB, Verma SK, Tanwar RS, Charanjeet L.Carotid artery intima - media thickness and its relation with lipid profile in nondiabetic uremic patients. Indian JNephrol 2006;16:170-3
[23] Sharma BK, Jindal SK, Rana DS, Gupta B, Kumar M. Absence of hyperlipidemia in patients of chronic renal failure in Chandigarh.Ind.J.Med. Res 1980; 72:461-6.