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Original research article

Cardiovascular clinical profile of patients with chronic kidney disease

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Abstract

Cardiovascular disease is increased in patients with chronic kidney disease (CKD) and is the principle cause of morbidity and mortality in these patients. Dyslipidaemia is a factor of the progression of CKD that increases the risk in developing atherosclerosis and its complications. Normal healthy individuals without any significant systemic medical illness, individuals with normal biochemical profile and normal USG abdomen were taken for study, however individuals with hypertension, diabetes and significant systemic medical illness were excluded from this. In present study out of 100 patients,40 had LVH on ECG, among which 34 (85%) had abnormal lipid profile, while 6 (15%) had normal lipid profile. In present study, out of 100 patients, 54 had LVH on 2D Echo, among which 44(81.5%) had abnormal lipid profile and 10(18.5%) had normal lipid profile.

Keywords: Cardiovascular clinical profile, chronic kidney disease, lipid profile

Introduction

Chronic kidney disease (CKD) is defined as the presence of objective kidney damage and/or the presence of a glomerular filtration rate of 60ml/min/1.73m² body surface area, or less, for at least 3 months, irrespective of the underlying etiology of the kidney damage [1]. It has been estimated that the age-adjusted incidence rate of End Stage Renal Disease (ESRD) in India is around 229 per million population [2], and more than one lakh new patients enter renal replacement programs annually in India [3].

Dyslipidemia has been identified as an independent risk factor for the progression of kidney disease. The deleterious effect of hyperlipidemia on the progression of kidney disease is based on a number of lines of evidence. Hyperlipidemia has been clearly shown to accelerate the progression of kidney disease. There is extensive evidence for the processes involved in lipid induced kidney damage, where multiple mechanisms appear to be involved. In chronic kidney disease the most prevalent lipid abnormalities which have been noted are hypertriglyceridemia and decreased HDL concentration. The LDL levels are usually found to be normal or increased [4].

Cardiovascular disease is increased in patients with chronic kidney disease (CKD) and is the principle cause of morbidity and mortality in these patients [5]. Dyslipidaemia is a factor of the progression of CKD that increases the risk in developing atherosclerosis and its complications.

Thus, although some patients with CKD will ultimately develop end stage renal disease (ESRD), most patients with CKD will die of CVD before dialysis becomes necessary [6]. Several factors contribute to atherogenesis and CVD in patients with CKD. So study of lipid abnormalities in CKD is very essential for the prevention and delaying of cardiovascular complications by giving optimal treatment.

Methodology

- Detailed history was taken from patients and meticulous examination was done according to prepared proforma.
- Thorough physical examination of all the systems were done.
- Previous hospital records and investigations were recorded.
- Patients were subjected for investigations wherever required.

Inclusion criteria

- All stages of stable CKD patients.

Exclusion criteria

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- Critically ill patients.
- Recent worsening of CKD.
- Acute on chronic renal failure.
- Patients on lipid lowering drugs.
- Associated co-morbid conditions such as febrile illness.

Sample size: 100.

Study design

It is an observational cross-sectional study of alterations in lipid profiles in patients with kidney disease of duration more than 6 months. An estimation of total cholesterol, triglycerides, serum HDL, cholesterol and VLDL cholesterol was done by enzymatic method by using an autoanalyser in District Hospital Hi-Tech Laboratory.

Normal healthy individuals without any significant systemic medical illness, individuals with normal biochemical profile and normal USG abdomen were taken for study, however individuals with hypertension, diabetes and significant systemic medical illness were excluded from this.

Results

Table 1: Comparison of LVH in CKD patients on ECG

Particulars	No. of Cases	Percentage
LVH	40	40
No LVH	60	60
Total	**100**	**100**

In present study, out of 100 patients with CKD, 40 (40%) had LVH and 60 (60%) had no LVH on ECG.

Table 2: Comparison of LVH in CKD patients on 2DECHO

Particulars	No. of Cases	Percentage
LVH	54	54
No LVH	46	46
Total	100	100

In present study, out of 100 patients with CKD, 54 (54%) had LVH and 46 (46%) had no LVH on ECG.

Table 3: Comparison of ECG finding among different stages of chronic kidney disease in cases

		ECG		Total
		LVH	Normal	
Stage	1	0 (0.0%)	4 (6.7%)	4
	2	2 (5.0%)	10 (16.7%)	12
	3	4 (10.0%)	40 (66.7%)	44
	4/5	34 (85.0%)	6 (10.0%)	40
Total		40 (100%)	60 (100%)	100

Chi-square=56.654; p<0.001.

85% of cases in stage 4/5 had LVH on ECG while the proportion was 10% and 5% in stages 2 and 3, respectively.

Table 4: Comparison of ECHO finding among different stages of chronic kidney disease in cases

		2D ECHO		Total
		LVH	Normal	
Stage	1	0 (0.0%)	4 (8.7%)	4
	2	4 (7.4%)	8 (17.4%)	12
	3	16 (29.6%)	28 (60.9%)	44
	4/5	34 (63.0%)	6 (13.0%)	40
Total		54 (100%)	46 (100%)	100

Chi-square=27.744; p<0.001

63% of cases in stage 4/5 had LVH on ECG while the proportion was 29.6% and 7.4% in stages 2 and 3, respectively.

Table 5: Comparison of ECG finding among chronic kidney disease patients with normal and abnormal lipid profile

		ECG		Total
		LVH	Normal	
Lipid profile	Abnormal	34 (85.0%)	20 (33.3%)	54

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	Normal	6 (15.0%)	40 (66.7%)	46
Total		40 (100%)	60 (100%)	100

Chi-square=25.792; p<0.001

In present study out of 100 patients,40 had LVH on ECG, among which 34 (85%) had abnormal lipid profile, while 6 (15%) had normal lipid profile.

Table 6: Comparison of ECHO finding among chronic kidney disease patients with normal and abnormal lipid profile

		2D ECHO		Total
		LVH	Normal	
Lipid profile	Abnormal	44 (81.5%)	10 (21.7%)	54
	Normal	10 (18.5%)	36 (78.3%)	46
Total		54 (100%)	46 (100%)	100

Chi-square=35.691; p<0.001.

In present study, out of 100 patients, 54 had LVH on 2D Echo, among which 44(81.5%) had abnormal lipid profile and 10(18.5%) had normal lipid profile.

Discussion

In present study, out of 100 patients, LVH is present in 54 cases. Out of which 44 (81.5%) cases having abnormal lipid profile and 10 (21.7%) cases having near normal lipid profile.

This shows that there is significant correlation between lipid profile and LVH in CKD patients.

Kozue Okumura *et al*., study showed association of eGFR and LVH in CKD patient.

Szu-Chia Chen, *et al*., in their clinical study showed step wise increase in LVH and decrease in LVEF corresponds with the stages of CKD in diabetes patients (advancement of CKD stage 3 to stage 5 was 44.4%, 61.6%, and 83.9%) [7].

In present study also there is stepwise increase in LVH as CKD progress from stage I to stage V (0%, 7.4%, 29.6% and 63% in I, II, III and IV/V respectively).

ECHO assessment of LVH in patients of chronic renal failure study by S.Agarwal and PD. Dangn, *et al*., showed increase in LVH with increase severity of CRF. Mild to moderate CRF shows 40% LVH cases, severe CRF shows 97% LVH cases [8, 9].

In present study out of 100 patients 54 (54%) cases having LVH. Out of these 54, 44 (81.5%) having lipid abnormalities.

Rizna Abdul Cader *et al*., in their study on peritoneal dialysis of CKD patients showed that 80.6% had LVH on ECHO [10].

Conclusion

The present study shows that patients with CKD have higher left ventricular mass index and higher prevalence of left ventricular hypertrophy (LVH), which is more marked in patients with stage 4/5 of CKD.

The high prevalence of LVH in these populations on echocardiography implies that these patients require detailed cardiovascular evaluation despite absence of symptoms, and also that various efforts aimed at prevention and control of LVH should be started early during the course of renal insufficiency, such as effective control of hypertension and anaemia.

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