



ORIGINAL RESEARCH PAPER

Nephrology

ECHOCARDIOGRAPHIC CHANGES IN CKD PATIENTS ON MAINTAINANCE HAEMODIALYSIS

KEY WORDS: Chronic Kidney Disease, Echocardiography, Maintenance hemodialysis, left ventricular hypertrophy, left ventricular systolic dysfunction, Left ventricular diastolic dysfunction

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INTRODUCTION

Chronic kidney disease (CKD) carries a significant association with cardiac diseases, which suggests a minor reduction in the glomerular filtration rate (GFR) can act as an independent risk factor for causing cardiovascular abnormalities. Patients of CKD having cardiovascular disease (CVD) had three to thirty times higher risk of mortality as compared to the general population. In addition, mortality among cardiovascular patients has been found to be twofold higher in CKD stage 2 patients and three-fold higher in patients with stage 3 CKD, when collated to patients with normal renal function. Furthermore, cardiomyopathy among hemodialysis (HD) is due to the presence of coronary artery obstruction, reduction in coronary reserves, and left ventricular (LV) physiological-structural abnormalities secondary volume and pressure overload. Echocardiography is a gold standard diagnostic modality for the identification of cardiac structural and functional abnormalities. Therefore, the evaluation of echocardiographic parameters in patients of CKD can help to determine the risk and prognosis of CVD in patients of CKD. In the present study, we evaluated the echocardiographic findings in patients of CKD on maintenance hemodialysis.

METHODS

This cross-sectional study was conducted in Department of General Medicine Dr. D.Y. Patil hospital, Navi Mumbai between February 2024 to April 2024. A total of 10 patients who were on maintenance haemodialysis were included in the analysis. 2D Echo (Two-dimensional transthoracic echocardiography) was done in each patient for the determination of cardiac structural and functional parameters such as LV hypertrophy, LV systolic dysfunction, and LV diastolic dysfunction.

Observations

Total patients taken up for study was 10, out of which 6 were males and 4 were females between the age group of 40-60 years. All patients had serum creatinine between range of 6 to 8 mg/dl and were on maintenance haemodialysis. Out of the 10 patients 7 had cardiovascular involvement, 6 patients hypertensive, 4 diabetic and 8 patients had anaemia.

DISCUSSION

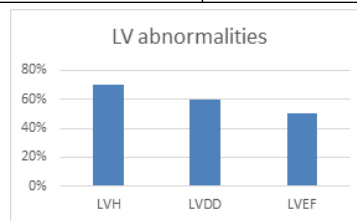
CKD patients have higher proportions of congestive heart failure that is associated with a higher mortality rate in these patients Echocardiography is a valuable tool to assess the changes in function and structure of the heart that result from CKD. Abnormal LV geometry, reduction in interventricular septum strength, and changes in LV mass index are important parameters that are affected by CKD in patients with preserved EF.

RESULTS

The mean age of patients was 50 years. There was male dominance with male/female ratio 6/4. There were 60% hypertensive and 80% anaemic patients.

Regarding echocardiographic abnormalities, LV systolic dysfunction was diagnosed in 50% patients, LV diastolic dysfunction in 60% patients and LVH in 70% of the patients.

| Variable | Value |
|----------------------|-------------------|
| Gender (male/female) | 6 male / 4 female |
| Mean age | 50 yrs (40 -60) |
| Serum creatinine | 6.2 ± 1.4 |
| Diabetes | 40% |
| Hypertension | 60% |
| Anaemia | 80% |



CONCLUSION

In conclusion, structural and physiological abnormalities of right and left ventricle are more commonly affected among patients with mild or moderate renal disorder, whereas right ventricle function and structure are independently associated with CKD progression. Furthermore, there is higher frequency of cardiac abnormalities among CKD patients on maintenance HD especially in patients having concomitant hypertension. LVH is the most common structural defect and LV diastolic dysfunction is the most common functional cardiac defect in CKD patients on HD. Additional workup of cardiovascular pharmacological management specifically among the HD group is required to make an evidence-based clinical decision to alleviate CVD in this higher risk group. However, the conclusion can be interpolated to the population considering the small sample size of this study. Technology advances in HD may provide an opportunity to prevent CVD associated with dialysis treatment.

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