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Spring 5-1-2021

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TRACKING ECHOCARDIOGRAPHY IN PATIENTS WITH CHRONIC  
KIDNEY DISEASE**

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## EVALUATION OF CARDIAC FUNCTION USING SPECKLE TRACKING ECHOCARDIOGRAPHY IN PATIENTS WITH CHRONIC KIDNEY DISEASE

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**BACKGROUND:** Patients with chronic kidney disease are at higher risk of developing systolic and diastolic dysfunction of the left ventricle especially in later stages. They are also at a higher risk of right heart dysfunction and pulmonary arterial hypertension. Further, changes in loading conditions of heart may affect both systolic and diastolic dysfunction and lead to development of symptoms. Conventional echocardiographic parameters may not be sensitive enough to pick up cardiac dysfunction at early stages. Speckle tracking strain echocardiography may be more useful in identifying early cardiac dysfunction and changes due to variations in preload and afterload. Such dynamic strain echocardiography findings, if proven, will help in diagnosis of diastolic heart failure which is common in patient with chronic kidney disease. In literature, no study has been conducted on effect of loading conditions on heart in Indian population. No study on Right ventricular strain has been conducted in patients with chronic kidney disease among Indian population

**OBJECTIVES:** To assess left and right ventricular function using speckle tracking echocardiography and conventional echocardiography in various stages of chronic kidney disease. To compare the effect of changes in preload and afterload on conventional and strain echocardiographic parameters in patients with different stages of chronic kidney disease. To assess pulmonary artery pressure in patients with chronic kidney disease.

**METHOD:** Patients with CKD stage 2, 3 or 4, undergoing echocardiography as a part of standard care were approached. A brief clinical history including details regarding co-morbidities and past treatment/procedures were noted. Blood pressure was recorded. ECG findings and basic lab investigations were noted. Cardiac structural and functional assessment was done using Doppler, tissue Doppler echocardiography and strain imaging at baseline, increased preload stage and oncreased afterload stage.

**RESULTS&CONCLUSION:** With higher stage of CKD at baseline, using Conventional echo parameters our study is showing signs of fluid retention and diastolic heart failure in terms of elevated PA pressure, increased LV and IVC dimensions elevated LV EDP, LV EDV, E/e' ratio, early diastolic tissue annular velocity and significant decrease in systolic and late diastolic strain rate. Within each group of CKD, we observed that changing the loading condition did not change the doppler and strain parameters like E/A, mitral filling pressures (E/e '), early diastolic tissue annular velocity and late diastolic strain rate. Overall, with increasing the preload and afterload there was no significant changes noted in Doppler and Strain parameters when compared between all three groups (CKD 3v vs CKD4 vs CKD5)

Despite fluctuated baseline characteristics among different stages of CKD, the study did not demonstrate significant difference in the effect of loading condition between CKD 3, 4, 5 stages. Large prospective studies pertaining to the evaluation of loading condition in higher grades of diastolic dysfunction/ heart failure with preserved ejection fraction among CKD cohort would give more insight on early identification of patients at risk of developing heart failure.