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Prevalence of left ventricular systolic and diastolic dysfunction in patients with chronic kidney disease and preserved left ventricular ejection fraction

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BACKGROUND: Presence of heart failure (HF) is associated with poor outcome in patients with chronic kidney disease (CKD), although Left ventricular (LV) systolic function is often preserved in them. However, CKD patients may have HF symptoms with preserved LVEF. Myocardial Deformation Imaging is more accurate for detecting LV systolic dysfunction. The aim of this study was to evaluate global longitudinal (GLS) and circumferential strain (GCS) in patients with renal function impairment.

METHODS: Overall, 67 patients (40% men, mean age 45 ± 12 years) with CKD stage 3-4 were studied. All patients had an LV ejection fraction =50%. We performed echocardiography including speckle-tracking (STE) measurement of LV GLS and LV GCS and as well as assessment of diastolic function.

RESULTS: Despite preserved LVEF, impaired LV GLS (<18%) was observed in all patients. The mean value of GLS was 14,1±1,5. This finding indicates that systolic dysfunction in CKD started from compromise LV longitudinal function. However, the GCS parameter was in the normal range – 22,7±1,8. Thereby preserved LVEF was compensated by normal or slightly increase circumferential strain. Impaired diastolic function was observed in 18% of patients including 8% patients with increased left ventricle filling pressure (stage II-III).

CONCLUSION: The prevalence of impaired LV GLS despite preserved LVEF in patients with CKD stage 3-4 is high, which proved that renal disease is associated with early and subclinical impairment of LV systolic function. Impaired diastolic function was not so common among them. Assessment of it is not always so easy and reliable using current recommendation. Thus, STE can be recommended for early detection impairment of LV function.