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The clinical significance of diastolic dysfunction assessed by echocardiography in patients with end-stage kidney disease

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Objectives: Uremic cardiomyopathy is characterized by the diastolic dysfunction with left ventricular hypertrophy and myocardial fibrosis in chronic kidney disease. The clinical significance of diastolic dysfunction in end-stage kidney disease (ESKD) remains uncertain. We investigated the prognosis in ESKD patients according to the diastolic dysfunction.

Methods: This retrospective study enrolled a total of 1038 patients who started dialysis between 2010 and 2020, and received both pre-dialysis and post-dialysis echocardiography. Patients were classified according to the grade of diastolic dysfunction: diastolic dysfunction grade (DDG) 1, 2, and 3. Presence of atrial fibrillation (AF) was classified separately. The grade of diastolic dysfunction was assessed according to the 2016 recommendation of American Society of Echocardiography. The primary outcome was all-cause mortality.

Results: The average age was 60 years and males were 63.8%. Pre-dialysis normal diastolic function, DDG1, DDG2, DDG3, DDG undetermined, and AF was found in 280, 148, 191, 22, 335, and 62 patients, respectively. The risk of mortality was higher in pre-dialysis DDG3 and AF than normal diastolic function in the univariable analysis. However, after adjusting for age and estimated glomerular filtration rate (eGFR) at the initiation of dialysis, pre-dialysis diastolic dysfunction or AF did not affect to mortality. When post-dialysis echocardiographic parameters were included, post-dialysis DDG3 (HR 6.20, 95% CI 1.11–34.54, p=0.04) and post-dialysis AF (HR 4.90, 95% CI 1.06–22.59, p=0.04) were associated with higher risk of mortality compared to post-dialysis normal diastolic function in multivariable analysis. Post-dialysis left ventricle ejection fraction (HR 0.977 95% CI 0.951–0.994, p=0.008), old age, peripheral artery disease, and high eGFR at dialysis initiation were associated with higher risk of mortality.

Conclusions: Age and general medical condition may be more important prognostic factors than diastolic dysfunction before dialysis. However, post-dialysis echocardiographic findings, including diastolic dysfunction, could be prognostic markers in ESKD patients.