

Diastolic dysfunction patterns in dialysis patients with elevated left ventricular filling pressure

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Background: We hypothesize that left ventricular (LV) relaxation of dialysis patients is more severely depressed than non-dialysis patients with diastolic dysfunction. The aim of present study was to evaluate the diastolic parameters in dialysis patients with elevated LV filling pressure, compared with non-dialysis patients. **Methods:** We studied 34 dialysis and 34 non-dialysis patients with elevated LV filling pressure. Retrospective echocardiographic study including tissue Doppler imaging (Ea) was obtained in all patients of elevated LV filling pressure with normal LV ejection fraction. **Results:** The mean LV mass index and left atrial volume index were not significantly different in dialysis and non-dialysis patients (129 ± 24 vs. 123 ± 23 g/m², and 44 ± 11 vs. 45 ± 12 mL/m², respectively). The mean E/Ea representing LV filling pressure was almost identical in both groups (13.8 ± 3.4 vs. 13.6 ± 3.0). However, the mean mitral E of dialysis patients was significantly lower and mitral A was significantly higher than non-dialysis patients (80 ± 18 vs. 92 ± 20 cm/s, $p = 0.04$, 109 ± 20 vs. 88 ± 23 cm/s, $p < 0.001$, respectively). The mean lateral Ea of dialysis patients was significantly lower than non-dialysis patients (5.9 ± 1.1 vs. 6.9 ± 1.5 cm/s, $p = 0.01$). **Conclusions:** Although LV filling pressure was similar in dialysis and non-dialysis patients, each parameter (E, Ea) of LV filling pressure were significantly different. Our study suggests that the high LV filling pressure in patients with dialysis might be mainly caused by a more severely depressed LV relaxation.

	Dialysis	Non-dialysis	P
LVMI (g/m ²)	129±24	123± 22	0.45
LAVI (mL/m ²)	44	45	0.90
E (cm/s)	80±18	92±20	0.04
A (cm/s)	109±20	88±23	<0.001
Ea (cm/s)	5.9±1.1	6.9±1.5	0.01
E/Ea	13.8±3.4	13.6±3.0	0.76

2D echocardiography vs. MRI in measurements of ejection fractions in advanced heart failure patients

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Background: ICD or CRT device implantation is recommended as class I or IIa indication in heart failure patients with LVEF $\leq 35\%$ for primary prevention of sudden arrhythmic death. Exact measurement of ejection fraction (EF) is a key step to select high risk patients who benefit from ICD or CRT device therapy. Although cardiac MRI is regarded as a gold standard test in EF measurement, visual estimation of EF using 2D echocardiography is still commonly used in routine clinical practice due to its convenience. **Methods:** Ischemic or non-ischemic cardiomyopathy patients who were admitted to Dong-A University Hospital for heart failure from 2012-2016 were screened. Patients who underwent both 2D echocardiography and cardiac MRI for EF measurement at a time interval less than 14 days with prophylactic ICD or CRT device therapy in mind were selected. The discrepancy between measured EFs was evaluated retrospectively. **Results:** Among the 298 heart failure patients who underwent both 2D echocardiography and cardiac MRI, a total of 80 patients (male 52, age 59 ± 14 years) with potential indications of prophylactic ICD or CRT device therapy were selected for analyses. Cardiac MRI was performed at 12 ± 3 days after 2D echocardiographic evaluation. EFs measured by cardiac MRI and visual estimation using 2D echocardiography were 25 ± 11 vs. $31 \pm 10\%$ ($p = 0.001$). Significant ($\geq 10\%$) discrepancy of EF was noted in 37 (46%) patients. Of the 37 patients, 28 (76%) had higher EF on 2D echocardiography. Clinical parameters including sex, age, and etiology were not related with the presence of EF discrepancy. Among the 80 selected patients, 61 had visually estimated EF $\leq 35\%$ on 2D echocardiography. However, 11 (18%) of the 61 patients were proven to have EF $> 35\%$ by MRI. In contrast, all of the 19 patients with EF $> 35\%$ on 2D echocardiography were proven to have EF $\leq 35\%$ on cardiac MRI. **Conclusion:** When compared with cardiac MRI, visual estimation using 2D echocardiography under or overestimated EF with discrepancy $\geq 10\%$ in significant number of heart failure patients with potential indications of ICD or CRT device therapy for primary prevention of sudden arrhythmic death.