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Relationship of different blood pressure measurements and left ventricular diastolic dysfunction in peritoneal dialysis patients

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Objectives: Cardiovascular diseases (CVDs) are known to be main causes of death in end stage renal disease (ESRD) patients and one of the CVDs, left ventricular diastolic dysfunction is suggested to be associated with increased mortality in these patients. Hypertension is an important modifiable risk factor for CVDs including diastolic heart failure. In this study, we compared different methods of blood pressure (BP) measurement and evaluated comparative values of BP measurement for predicting diastolic heart dysfunction in patients on peritoneal dialysis (PD).

Methods: A total of 52 prevalent PD patients were enrolled. We measured ambulatory BP, office BP, home BP, and central BP. The ambulatory BP was recorded for 24 hours, office BP was measured at least in two visits, and home BP was measured for one week. The central BP was estimated using radial artery tonometry. Patients underwent transthoracic echocardiography and the presence of diastolic dysfunction was determined according to 2016 American Society of Echocardiography and European Association of Cardiovascular imaging (ASE/EACVI) guideline.

Results: Left ventricular diastolic dysfunction was best predicted by ambulatory systolic BP (area under the curve (AUC), 0.845; 95% CI, 0.726-0.964). The office systolic BP (AUC, 0.661; 95% CI, 0.457-0.866), home systolic BP (AUC, 0.661; 95% CI, 0.481-0.842), and central systolic BP (AUC, 0.623; 95% CI, 0.441-0.805) were inferior to ambulatory systolic BP monitoring in predicting diastolic dysfunction. In multivariate analysis adjusted for age, sex, PD vintage, diabetes and coronary artery disease, only ambulatory systolic BP had significantly increased OR for diastolic dysfunction (OR, 1.094; 95% CI 1.004-1.192). The other adjusted ORs of office, home, and central systolic BP for diastolic dysfunction were not statistically significant.

Conclusions: Ambulatory systolic BP was the strongest predictor of left ventricular diastolic dysfunction in comparison with the other BP measurements including office, home, and central systolic BP, in ESRD patients on PD.