Prognostic value of admission left ventricular outflow tract velocity time integral in hospitalized heart failure patients with preserved ejection fraction: a report from the JASPER registry

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Topic(s):
Heart Failure with Preserved Ejection Fraction

Citation:
Backgrounds: There are little effective treatment strategies for heart failure with preserved ejection fraction (HFpEF) to achieve a reduction of morbidity and mortality. Thus, accurate prognostication of patients with HFpEF could help improve their outcomes by identifying high-risk patients who might potentially benefit from intensive inpatient and outpatient monitoring and early referral for advanced HFpEF therapy. The left ventricular outflow tract velocity time integral (LVOT-VTI) is a representative non-invasive parameter for evaluating stroke volume, which can be a determinant of adverse outcomes in hospitalized patients with heart failure. However, the prognostic implication of admission LVOT-VTI for hospitalized HFpEF patients is undetermined.

Purpose: The aim of the present study was to investigate whether admission LVOT-VTI could predict poor clinical outcomes in hospitalized patients with HFpEF.

Methods: We examined consecutive 535 hospitalized HFpEF patients (left ventricular ejection fraction =50%) due to acute decompensated heart failure from the JASPER (JApanese heart failure Syndrome with Preserved Ejection fRaction) multicenter registry, obtained between November 2012 and March 2015. Patients without accessible LVOT-VTI data on admission were excluded. Finally, 214 patients were examined. The primary outcome of interest was composite of all-cause death and rehospitalization due to heart failure.

Results: Mean age was 78 ± 11 years, 100 were male, and median plasma brain-type natriuretic peptide level was 400 (interquartile range [IQR] 223-711) pg/ml. During a median follow-up period of 688 (IQR 162-810) days, adverse events occurred in 83 patients (39%), including 47 (22%) all-cause death, 51(24%) rehospitalization due to heart failure. The c-index of LVOT-VTI for predicting the composite of adverse events was 0.59 (95% CI 0.51 to 0.67), and the optimal cut-off value of LVOT-VTI was 15.8 cm. Low LVOT-VTI (=15.8 cm) was significantly associated with higher adverse events compared to high LVOT-VTI (>15.8 cm) (Figure). Multivariable Cox regression analysis revealed that lower LVOT-VTI was an independent determinant of adverse events (HR 0.94, 95% CI 0.91 to 0.98, P = 0.005) even after adjustment for pre-specified confounders including age, sex, systolic blood pressure, serum sodium, albumin, plasma brain-type natriuretic peptide and renal function.

Conclusions: Lower admission LVOT-VTI was an independent determinant of worse clinical outcomes in hospitalized HFpEF patients, indicating that LVOT-VTI on admission could be a useful marker for risk stratification in these patients.
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Figure Survival analysis for composite of all-cause death and heart failure hospitalization categorized by left ventricular outflow tract velocity time integral (LVOT-VTI)