

Serial echocardiographical assessment for urgent control of rapid atrial fibrillation in acute heart failure

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Objectives: Doppler echocardiography is a well-recognized technique for noninvasive evaluation; however, little is known about its efficacy in patients with rapid atrial fibrillation (AF) accompanied by acute decompensated heart failure (ADHF). The aim of this study was to explore the usefulness of serial echocardiographical assessment for rapid AF patients with ADHF.

Patients: A total of 110 ADHF patients with reduced ejection fraction (HFrEF) and rapid AF who were admitted to the CCU unit and received landiolol treatment to decrease the heart rate (HR) to <110 bpm and change HR (Δ HR) of >20% within 24 hours were enrolled.

Interventions: Immediately after admission, the patients (n=110) received landiolol, and its dose was increased to the maximum; then, we repeatedly performed echocardiography. Among them, 39 patients were monitored using invasive right heart catheterization (RHC) simultaneously with echocardiography.

Measurements and main results: There were significant relationships between

Doppler and RHC parameters through the landiolol treatment (Figure, baseline–max HR treatment). We observed for the major adverse events (MAE) during initial hospitalization, which included cardiac death, HF prolongation (required intravenous treatment at 30 days), and worsening renal function (WRF). MAE occurred in 44 patients, and logistic regression analyses showed that the mean left atrial pressure (mLAP)-Doppler (odds ratio = 1.132, 95% confidence interval [CI]: 1.05–1.23, p=0.0004) and stroke volume (SV)-Doppler (odds ratio = 0.93, 95% confidence interval [CI]: 0.89–0.97, p=0.001) at 24 hours were the significant predictors for MAE, and multivariate analysis showed that mLAP-Doppler was the strongest predictor (odds ratio = 1.16, 95% CI: 0.107–1.27, p=0.0005) (Table).

Conclusions: During the control of the rapid AF in HFrEF patients with ADHF, echocardiography was useful to assess their hemodynamic condition, even at bedside.

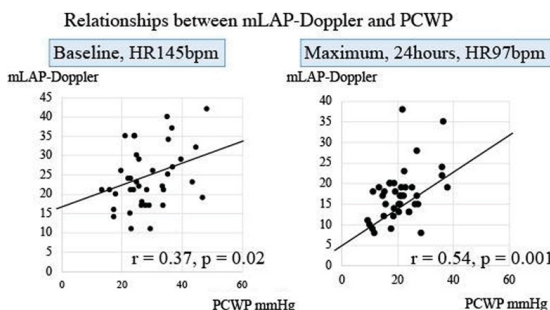


Table. Multiple Logistic Regression Analysis for MAE

	Baseline			Initial dose, 2hours			Max dose, 24hours		
	OR	95% CI	p Value	OR	95% CI	p Value	OR	95% CI	p Value
mLAP (mmHg)	1.05	1.006-1.107	0.02	1.05	1.001-1.06	0.04	1.16	1.107-1.27	0.0005
SV-Doppler (ml)	0.97	0.87-1.09	0.73	0.97	0.93-1.02	0.23	0.94	0.91-0.97	0.01

$$mLAP = 1.24 \times (\text{averaged } E/e') + 1.9$$

$$SV\text{-Doppler} = VTI \times CSA(\text{cross-sectional area})$$

Doppler for rapid AF of ADHF

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