Long-term Prognosis of Advanced Heart Failure Patients with Very Severe Left Ventricular Systolic Dysfunction after Cardiac Resynchronization Therapy

Kyung Min Min  
Tae Ho Youn  
Min Jung Bak  
David Hong  
Sang Yoon Lee  
Seong Soo Lee  
Young Jun Park  
Kyoung Min Park  
Young Keun On  
June Soo Kim  
Seung Jung Park

**Introduction**: Many clinical trials of cardiac resynchronization therapy (CRT) for heart failure (HF) adopted left ventricular ejection fraction (LVEF) as a part of inclusion criteria and upper cut-off point was around 30% to 40%. However, few patients with significantly reduced LVEF(<20%) were enrolled in the studies.

**Methods**: Long-term outcomes of CRT for advanced HF patients with very severe LV systolic dysfunction (vs-LVSD group, LVEF<20%, n=33) were retrospectively compared to those with moderate to severe LVSD (ms-LVSD group, 20%≤LVEF<40%, n=136). The primary outcome was hospitalization for HF. The secondary outcome was a composite of hospitalization for HF, cardiac death, heart transplantation, implantation of LV assist device or stroke. Echocardiographic response and super-response were defined by relative reduction in LV end systolic volume (LVESV) ≥15% and ≥30%, respectively.

**Result**: The vs-LVSD group had a significantly lower baseline LVEF than the ms-LVSD group (16.4±2.6% vs. 27.4±4.8%, P<0.001). However, the rate of hospitalization for HF in the vs-LVSD group (10/33, 30.3%) was not significantly different from that in the ms-LVSD group (39/136, 28.7%) over the follow-up duration of 33.7±27.3 months (hazard ratio [HR], 0.83; 95% confidence interval [CI], 0.42 to 1.6; P=0.58, Fig.1). The secondary composite outcome was noted in 13 (39.4%) patients in the vs-LVSD group and in 40 (29.4%) patients in the ms-LVSD group (HR, 1.09; 95% CI, 0.57 to 2.09; P=0.80, Fig.2). Proportion of responders or super-responders was not significantly different between the vs-LVSD and ms-LVSD groups (Responders, P=0.18; Super-responders, P=0.12, Table 2).

**Conclusion**: In terms of long-term clinical and echocardiographic outcomes, the efficacy of CRT for advanced HF patients with very severe LV systolic dysfunction was well-maintained just as for those with less severe dysfunction.