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

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**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.