

Characterization of Early Super-Responders to CRT and Long Term Improvement in Ejection Fraction

Buber, Yonatan; Abu-Sham'a, Raed; Nof, Eyal; Luria, David; Bar-Lev, David; Kuperstein, Rafael; Feinberg, Micha; Eldar, Michael; Glikson, Michael
Sheba Medical Center, Tel Hashomer, Israel

Background: Among patients implanted with cardiac resynchronization therapy (CRT) device, "super-responders" is a distinct subgroup for which CRT therapy is highly beneficiary. Current accepted definition for "super-response" is an absolute improvement >15-20% in the left ventricular ejection fraction (LVEF). Conflicting data exists regarding the predictors of super-response (SR) to CRT and of the endurance of the LVEF improvement.

Methods: Consecutive patients implanted with CRT between 2007 and 2010 underwent clinical, ECG and echo exams before implantation and yearly examinations thereafter. SR was defined as an absolute increase of >15% in the LVEF. Early SR (ESR) was defined as SR occurring within the 1st year. Univariate and multivariate models were performed for prediction of ESR, and an assessment of the LVEF was made.

Results: Of the 368 patients included, 8% had ESR. Mean follow-up was 3.1 years. Several previously described predictors were positively associated with SR on univariate analysis: female gender, prolonged QRS, non-ischemic cardiomyopathy and lower baseline end systolic volumes. In addition, ESR was positively associated with previously undescribed parameters: preexisting permanent pacemaker, pulmonary artery pressure < 35 mm HG and a < mild tricuspid regurgitation (TR). In multivariate analysis 4 parameters remained associated with SR: TR degree (OR 6.7), female gender (OR 3.2), prior pacemaker (OR 2.6) and longer QRS duration (OR 1.7). Baseline mean LVEF were similar by presence or lack of ESR (22.5% vs. 24% p=0.25). In a multivariate model ESR was independently associated with a significantly higher LVEF at both 2 and 3 years post-implantation (FIGURE).

Conclusions: The presence of preimplantation pacing and of less severe TR are novel independent predictors for ESR among a large population of patients implanted with a CRT. ESR is an independent predictor for a continuous improvement in the LVEF during a 3 year follow up period.

