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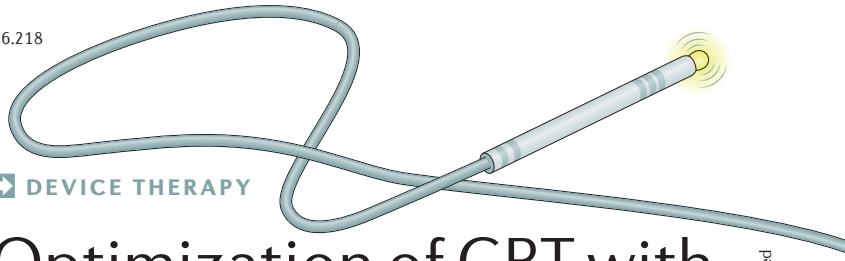

DEVICE THERAPY

Optimization of CRT with novel contractility sensor

A novel contractility sensor that allows automatic optimization of atrioventricular (AV) and interventricular (VV) timings was as safe and effective as echocardiography-guided optimization in improving responsiveness to cardiac resynchronization therapy (CRT). This finding from the RESPOND-CRT trial was published in the *European Heart Journal*.

CRT can improve cardiac function and reduce adverse remodelling in patients with medically refractory heart failure (HF) and left ventricular systolic dysfunction, but up to 30% of patients are nonresponsive to therapy. According to Josep Brugada, lead investigator of the RESPOND-CRT trial, "this nonresponsiveness can be decreased by optimizing the device programming, particularly the stimulation rate, paced and sensed AV delay, and the VV delay". However, echocardiography-guided optimization of AV and VV electrical timings is a resource-intensive process, and programming parameters can be measured only at rest and in a supine position. Therefore, a novel SonR contractility sensor (LivaNova, UK) was designed to enable automatic optimization of AV and VV timings, either at rest or during exercise, and was shown to improve clinical outcomes in a pilot study. On the basis of those promising findings, investigators of the RESPOND-CRT study sought to assess the safety and efficacy of the SonR contractility sensor embedded in the right atrial lead in patients with HF undergoing CRT.

RESPOND-CRT was a multicentre, randomized, double-blind, inferiority trial that enrolled patients with indications for *de novo* implantation of a CRT defibrillator. Patients were assigned to receive weekly automatic CRT optimization with SonR or echocardiography-guided optimization of AV and VV timings. The primary efficacy end point of the study was the rate of clinical responders (a composite of patients who were alive, without HF-related events, and had improvement in NYHA class of ≥1 level or improvement in quality of life of ≥5 points, at 12 months) and the primary safety end point was freedom from atrial lead-related complications.

In total, 670 patients were randomly assigned to SonR and 328 to echocardiography guidance. The rates of freedom from lead-related complications were not different between the two groups. Responder rates were higher in the SonR group than the echocardiography group (75.0% vs 70.4%; mean difference 4.6%, 95% CI −1.4% to 10.6%, $P<0.001$ for non-inferiority). Furthermore, SonR use was associated with a 35% risk reduction in HF hospitalization (HR 0.65, 95% CI 0.46–0.92, log-rank $P=0.01$) after 548 ± 190 days of follow-up. Importantly, the clinical response for most subgroups was in favour of SonR, especially patients with a history of renal dysfunction or atrial fibrillation. "The ability of the sensor strategy to frequently optimize and adjust for exercise periods might result in benefit in these sicker patients, especially during the augmented stress of exercise and over the course of remodelling," explains Brugada.

To conclude, the new SonR technology is both as effective and safe as traditional echocardiography-guided CRT optimization in patients with HF. Long-term data are needed to determine whether this approach could be the superior CRT optimization method.

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ORIGINAL ARTICLE Brugada, J. *et al.* Contractility sensor-guided optimization of cardiac resynchronization therapy: results from the RESPOND-CRT trial. *Eur. Heart J.* http://dx.doi.org/10.1093/eurheartj/ehw526 (2016)