

Heart Failure: Targeting the right patients for CRT-D

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Patients with dyssynchronous yet viable ventricles are most likely to benefit from cardiac resynchronization therapy combined with defibrillation, concludes the latest analysis of the MADIT CRT trial. The CRT-MADIT-CRT trial - presented at the Heart Failure Congress 2011, organized by the Heart Failure Association of the European Society of Cardiology (ESC) in Late Breaking Session 1 - showed that CRT produced improvements in both synchrony and contractile function, and that the extent of this benefit relates to subsequent outcomes.

The Multicentre Automatic Defibrillator Implantation Trial-CRT (MADIT-CRT) set out to determine whether patients with mild [heart failure](#) (NYHA class I or II) would do better if they got implanted with a CRT-D device (which combines [cardiac resynchronization therapy](#) with [defibrillation](#)), than if they only received the traditional ICD defibrillation. In earlier studies CRT-D devices had been approved for use in patients with severe heart failure (NYHA class III/IV).

In the MADIT-CRT study, funded by Boston Scientific, 1820 patients with Class I and II heart failure, wide QRS and left ventricular dysfunction were randomized 3:2 to receive CRT-D (n=1089) or ICD alone (n=731). Results, presented at the 2009 ESC Annual Conference in Barcelona after a follow period averaging 2.4 years, demonstrated a greater than 40% reduction in the primary endpoint of death or heart failure in patients receiving CRT-D. However, in virtually all studies of CRT-D approximately 30% of patients do not respond to therapy.

In the current study, Dr Scott D Solomon (Brigham and Women's Hospital, Boston, MA) and colleagues set out to investigate whether the degree of synchrony – the extent to which the walls of the left ventricle contract in unison – might influence the likelihood of patients responding to CRT-D. "It's important to target patients in whom CRT-D works well because the technology is quite expensive," explained Solomon.

In this latest analysis of MADIT-CRT, investigators analyzed echocardiograms from 1077 patients enrolled in MADIT-CRT (CRT-D n=66; ICD, n=416) who had echocardiographic images of sufficient quality to allow analysis of synchrony and contractile function. Researchers were blinded to the randomization and study outcomes.

Results showed that patients with mild to moderate dyssynchrony at baseline (defined as a time-to peak transverse strain SD of 142-230 ms) and greater baseline contractile function (longitudinal strain

The study showed that over a year each 10 ms decrease in LV dyssynchrony was associated with a 3% reduction in the primary outcome of death or heart failure, and each 5 point absolute increase in LV strain was associated with a 75% reduction in the primary outcome.

"These results suggest that the patients who are most likely to benefit from CRT-D are those with at least some dyssynchrony who have relatively preserved contractile function," said Solomon, adding that the observation that improvements in synchrony and contractile function were associated with reduced death and heart failure events, suggests that the benefits delivered by CRT relate to improvements in these factors. "Future studies will continue to try to identify the patients who are most likely to benefit from this expensive but highly effective therapy," he said.

Provided by European Society of Cardiology

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