

Echocardiographic Response to Dual Left Ventricular Versus Single Optimal Left Ventricular Cardiac Resynchronization Therapy

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BACKGROUND

- Despite fifteen years of incremental progress in tools and implant techniques, only two thirds of CRT patients respond.
- Multi-site pacing potentially offers certain advantages:
 - Pacing on either side of functional block can resolves the block
 - Higher chances of a lead being in the “sweet-spot”- late activated segment, without scar
 - Distal antero-lateral and basal postero-lateral leads may synchronize papillary muscle function
 - Shortens LV activation time

OBJECTIVE

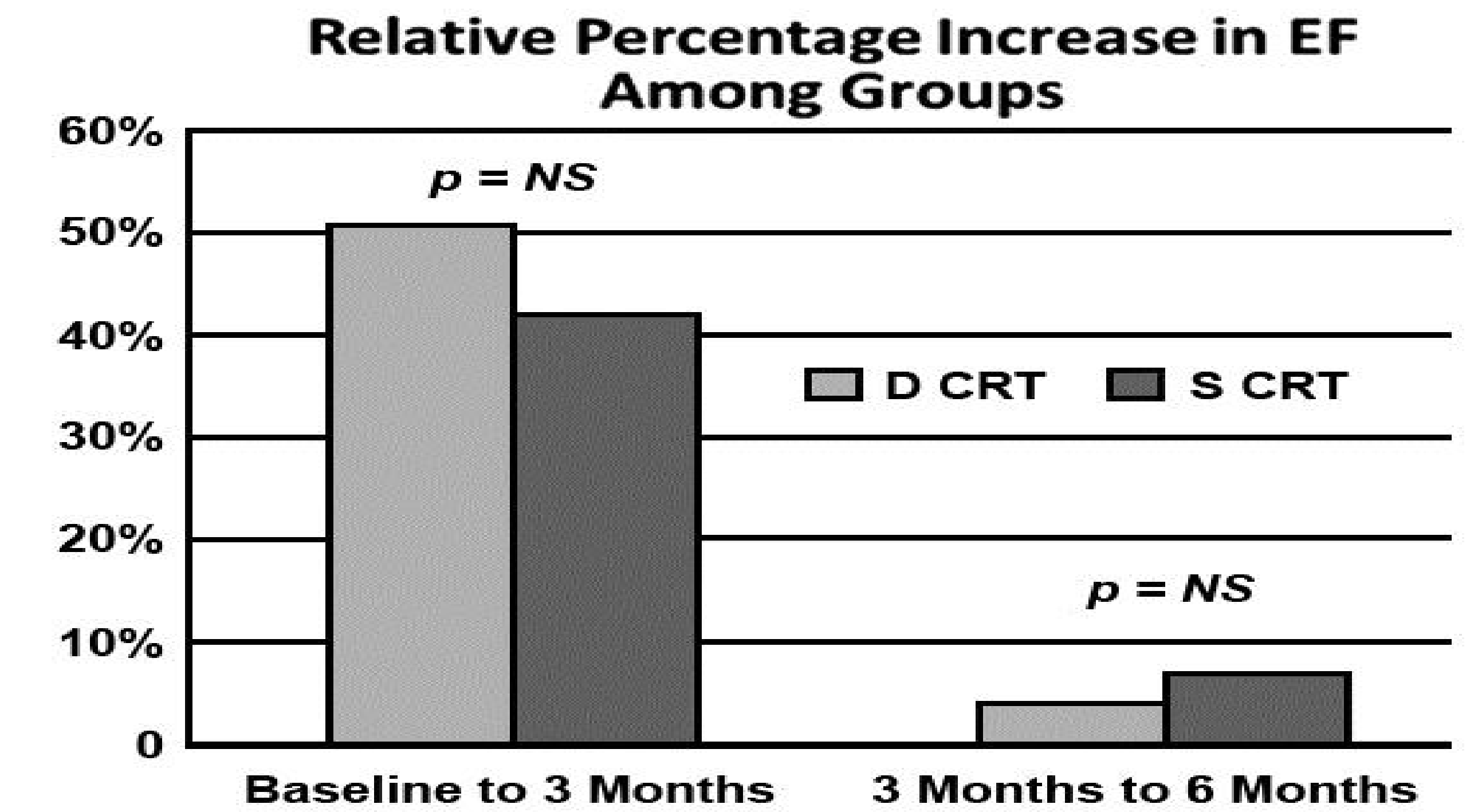
- This trial compared standard of care single left ventricular (LV) site cardiac resynchronization therapy (CRT) to biventricular pacing utilizing two widely separated LV leads paced in tandem with the right ventricular lead.
- Initial results showed:
 - Cardiac resynchronization therapy with dual-site LV pacing produced superior electrical resynchronization to standard CRT
- *The current abstract represents a sub-analysis of the study to assess change in LV Ejection fraction during follow-up of 2 groups.*

METHODS

- Inclusion criteria: standard criteria for CRT therapy
- The mean LVEF at implant was 26%
- 18 - non-ischemic cardiomyopathy, 21- ischemic cardiomyopathy.
- Each patient was implanted with a single RV and two widely separated LV leads. One LV lead (LVA) was placed more apically, the other (LVB) more basally. Each lead was placed in a different coronary vein.
- Echocardiograms performed at baseline, after 3 months, and 6 months were interpreted by a blinded echocardiographer.

| LV EF (%) | Relative Percentage Increase in EF Among Groups | | | |
|-----------|---|-----|----------------------|-----|
| | Baseline to 3 Months | | 3 Months to 6 Months | |
| | Mean | SD | Mean | SD |
| D CRT | 51% | 47% | 4% | 17% |
| S CRT | 42% | 38% | 7% | 26% |
| | p=NS | | p=NS | |

| Time | | Estimate | Standard Error | DF | P Value |
|----------|----------|----------|----------------|----|---------|
| Baseline | 3 months | -0.1158 | 0.01867 | 33 | <.0001 |
| Baseline | 6 months | -0.1567 | 0.02028 | 33 | <.0001 |
| 3 months | 6 months | -0.04087 | 0.01218 | 33 | 0.002 |



RESULTS

After 3 months, there was a greater percentage increase in EF in d-CRT (51%) than s-CRT (42%), although this difference was not significant. After crossover, there was similar further increase in LVEF % in both groups (4% vs 7%). Using the *Least Squares Means (LS Means)*, the effect of time was found to be statistically significant p value=<0.0001 while the treatment, gender, age, and interaction of treatment & time were not found to be statistically significant.

CONCLUSION

- Dual-CRT may produce greater reverse remodeling than s-CRT, although this difference may be marginal when the LV lead in s-CRT is positioned in the “optimal” basal/mid lateral position.
- The increase in LVEF may continue until 6 months and thereafter.