Cardiac Resynchronization Therapy in Patients with Heart Failure and Conduction Abnormalities Other than Left Bundle-Branch Block: Analysis of the Multicenter InSync Randomized Clinical Evaluation (MIRACLE)

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Summary

Background: Cardiac resynchronization therapy (CRT) has been proposed as a treatment for patients with congestive heart failure (CHF) and prolonged QRS durations. Previous studies have predominantly included patients with left bundle-branch block (LBBB). The Multicenter InSync Randomized Clinical Evaluation (MIRACLE) investigators assessed the efficacy of CRT in patients with CHF with QRS durations ≥ 130 ms and found that CRT lead to improvement in several measures of functional capacity and exercise tolerance.

Hypothesis: We designed this retrospective study to determine whether patients with CHF who have conduction abnormalities other than LBBB also respond favorably to CRT.

Methods: We divided patients enrolled in the MIRACLE trial into three subgroups according to conduction abnormality – LBBB, right bundle-branch block (RBBB), and nonspecific interventricular conduction delay (IVCD) – and compared the response among and within these groups to CRT or no CRT at baseline and 6-months’ follow-up.

Results: We found 313 patients with LBBB, 43 with RBBB, and 35 with IVCD. When they received CRT, significant improvement was achieved in functional class (p = 0.001) by patients with RBBB, and in quality of life (p = 0.038) by patients with IVCD. Patients in the RBBB and IVCD groups showed improvement in exercise time and peak oxygen consumption after CRT. Most patients with RBBB (82%) also had either left anterior fascicular block or left posterior fascicular block.

Conclusions: Patients with CHF with RBBB and IVCD do benefit from CRT. Improvement with CRT in patients with RBBB may be due to concomitant left-sided conduction abnormalities. Further subgroup analyses of other CRT trials are necessary to validate these results.

Key words: cardiac resynchronization therapy, congestive heart failure, conduction abnormalities