Abstract: P1537

Effect of atrial fibrillation on cardiac resynchronization therapy in patients with dilated cardiomyopathy and artificial complete A-V block

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Topic(s):
Cardiac Resynchronization Therapy

Citation:

Aim: The aim of the study was to elucidate the effects of atrial fibrillation on the efficacy of cardiac resynchronization therapy in patients with dilated cardiomyopathy and artificial complete A-V block.

Methods: The study included a total of 120 patients with dilated cardiomyopathy aged 32 to 75 years (55 ± 12 years). All patients had NYHA functional class III heart failure, left ventricular ejection fraction of 30.1 ± 3.8%, 6-min walk distance of 290.5 ± 64.3 m, left ventricular end diastolic volume of 220.7 ± 50.9 mL, and interventricular and intraventricular dyssynchrony of more than 120 ms. Patients were assigned to groups based on the presence or absence of atrial fibrillation before cardiac resynchronization therapy: group I included 54 patients (45%) with sinus rhythm; group II included patients with permanent form of atrial fibrillation before cardiac resynchronization therapy. Complete A-V block was achieved in all patients with atrial fibrillation.

Results: Follow up examination was performed 1 year after beginning of cardiac resynchronization therapy. All patients showed clinical improvement: left ventricular ejection fraction increased from 30.1 ± 3.8% to 42.8 ± 4.8% (p = 0.001); NYHA heart failure functional class decreased from III to II; 6-min walk distance increased from 290.5 ± 64.3 m to 377.2 ± 45.3 m (p = 0.001); left ventricular end diastolic volume decreased from 220.7 ± 50.9 to 197.9 ± 47.8 mL (p = 0.005). In 46 patients (38.3%) with initial atrial fibrillation, sinus rhythm spontaneously restored; left ventricular ejection fraction increased by 13%; and left ventricular end diastolic volume decreased by 18 mL. In patients with sinus rhythm, left ventricular ejection fraction increased by 15% after one year of cardiac resynchronization therapy; left ventricular end diastolic volume decreased by 32 mL. Atrial fibrillation persisted in 20 patients (16.7%). In these patients, left ventricular ejection fraction increased only by 9% whereas left ventricular end diastolic volume decreased by 13 mL on average.

Conclusion: Restoration and maintenance of sinus rhythm in patients with dilated cardiomyopathy and severe heart failure exerted positive effects on left ventricular ejection fraction increase and processes of left ventricular reverse remodeling leading to increase in cardiac resynchronization therapy efficacy.