The effect of cardiac resynchronization therapy on cerebral blood flow

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Sunday, March 14, 2010, 9:30 a.m.-10:30 a.m.

Session Title: Cardiac Resynchronization Therapy
Abstract Category: Cardiac Pacing
Presentation Number: 1026-147

Authors: Rutger van Bommel, Nina Ajmone Marsan, Hille Koppen, Victoria Delgado, Carel JW Borleffs, Claudia Ypenburg, Matteo Bertini, Martin J. Schalij, Jeroen J. Bax, Leiden University Medical Center, Leiden, The Netherlands

Background: Decreased cerebral blood flow is frequently observed in patients with heart failure and this may be the result of impaired cardiac systolic function. Cardiac resynchronization therapy (CRT) improves cardiac function and heart failure symptoms in selected patients. The effects of CRT on cerebral blood flow have not been evaluated before.

Methods: Left ventricular (LV) systolic function and cerebral blood flow were assessed in 35 heart failure patients, before and 6 months after CRT. Additionally, 15 heart failure patients, not being candidates for CRT were included as a control group. Peak-systolic velocity (PSV), end-diastolic velocity (EDV), mean velocity and pulsatility index (PI = [PSV-EDV] / mean velocity) were obtained from a minimum of 10 cardiac cycles in all subjects. Response to CRT was defined as a reduction in LV end-systolic volume (LVESV) ≥15%.

Results: At 6 months follow-up, PSV significantly increased from 83 ± 20 cm/s to 100 ± 20 cm/s (p=0.001), EDV increased from 29 ± 7 cm/s to 37 ± 8 cm/s (p<0.001) and mean velocity increased from 47 ± 10 cm/s to 58 ± 11 cm/s (p<0.001), only in responders to CRT (Figure). Conversely, no significant changes in cerebral blood flow were observed in non-responders and controls.

Conclusions: Cardiac resynchronization therapy induces an increase in cerebral blood flow in heart failure patients. This increase in cerebral blood flow is related to the improvement in LV systolic function.

![Graph A](image1)

![Graph B](image2)

![Graph C](image3)