

**Cardiac resynchronization therapy in children  
- experience of the Hungarian Paediatric Heart Centre**

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Introduction: Cardiac resynchronization therapy (CRT) is an accepted non-pharmacological treatment of heart failure, and an option for bridge-to-transplantation in adults and children. Though, CRT is used in different diseases; mode of implantation and outcomes can vary, respectively.

Method: Clinical conditions, mode of implantation and complications were recorded in patients treated with CRT between 18.10.2004-01.01.2011 in our Institute. Impact of CRT on long-term clinical response was evaluated.

Results: Left ventricular CRT was performed in 12 and right ventricular CRT in 1 patient with congenitally corrected transposition of the great arteries, respectively. Mean age at CRT: 3.75 years. Male-to-female ratio: 10:3. Mean follow-up period: 3.6 years.

Clinical conditions: congenital atrioventricular block (congAVB) with ventricular dysfunction developed during pacemaker (PM) therapy (6); congAVB with ventricular dysfunction present at time of PM-implantation and progressive heart failure (2); postoperative AVB (popAVB) with ventricular dysfunction developed during PM therapy (2); popAVB with ventricular dysfunction present at time of PM-implantation and progressive heart failure (1); hereditary DCM (1); myocarditis (1).

Mode of implantation: epicardial electrodes (9), endocardial electrodes (1), dual-chamber endocardial system up-dated with epicardial left ventricular electrode (2), right ventricular epicardial, right atrial and coronary sinus endocardial electrodes (1).

Function: CRT-pacemaker (12), CRT-defibrillation (1).

Complications: electrode dislocation (1), decubitus above generator (1), phrenic muscle stimulator (2), postoperative low cardiac output syndrome (2).

Impact on clinical course:

Cong/popAVB+good systolic function at PM-implantation: improvement (7); CRT discontinued due to phrenic muscle stimulator (1). CongAVB+ventricular dysfunction at PM-implantation: improvement, but heart transplantation (htx) after 2.6yrs (1); exitus (prae-transplant era) (1). PopAVB+ventricular dysfunction at PM-implantation: no improvement (LVAD 3months postCRT) + htx (1). DCM: exitus (prae-transplant era) (1). Myocarditis: worsening (1).

Conclusions:

1. Ventricular dysfunction related to congAVB after PM therapy is the most common clinical condition, where CRT was performed in paediatric patients.
2. CRT improved ventricular dysfunction developed during PM therapy regardless of the etiology of AVB.
3. CRT was ineffective as a rescue therapy for DCM in the prae-transplant era and in myocarditis, but had role in bridge-to-transplantation in DCM patient with congAVB.
4. In children mostly epicardial leads are used for CRT, and the complication rate is not negligible.