

Abstract

Introduction. Non-surgical complete atrioventricular block (CAVB) in children is a rare disease. In absence of physiological conduction from atria to ventricles, patients suffer from life-long bradycardia. As causal treatment is not available, the only option to alleviate clinical symptoms and prevent possible sudden cardiac death is to implant a permanent pacemaker (PM). Correct timing of PM implantation in asymptomatic children is often challenging and published data regarding this issue are scarce. In the light of potential complications of early PM implantation, it is desirable to postpone this treatment as much as possible.

Aims. We aimed to create a model of natural history of non-surgical CAVB in children and to find risk factors predicting need for future PM implantation in these patients. Also, we aimed to evaluate the effect of cardiac resynchronization therapy in heart failure patients associated with left ventricular apical epicardial pacing.

Methods: Retrospective analysis of a nation-wide cohort of paediatric patients with non-surgical CAVB between 1977 and 2016. Prospective case study evaluating the effect of cardiac resynchronization therapy in paediatric patients with heart failure associated with left ventricular apical pacing.

Results. Progression of bradycardia in children with a non-surgical CAVB is most significant during the first two years of life with subsequent slower yet significant decrease until reaching adulthood and is associated with preserved left ventricular function. Probability of the need for PM during five years following presentation can be predicted by mean 24-hour heart rate at presentation regardless of patient age at that time. An upgrade from single-site left ventricular apical pacing to multisite pacing improves left ventricular systolic function.

Conclusion. Paediatric patients with a non-surgical CAVB are well adapted to the progression of bradycardia. Risk stratification of need for subsequent pacemaker implantation is feasible and allows for individualized follow-up. Cardiac resynchronization therapy is an effective tool for improving left ventricular dysfunction associated with left ventricular apical pacing.

Key Words. Complete atrioventricular block, natural history, pacemaker, cardiac resynchronization therapy