

Infants and Small Childrens with the Extracardiac Implantable Cardioverter-Defibrillator - One Decade of Experience

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Objective:

Implantable cardioverter-defibrillators (ICD) are life-saving in patients with high risk for sudden cardiac death (SCD) from ventricular tachycardia/fibrillation (VT/VF). Special requirements need to be met to provide adequate ICD therapy in infants and young children because of small body size, faster heart rates and a higher level of activity. Programming as well as Implantation technique have to be tailored according to the demands of the small patients. We report a decade of experience with a completely extracardiac (EC) ICD implanted in infants and young children.

Methods:

A retrospective data analysis enrolling all pediatric patients who had an EC-ICD implanted at our institution between July 2004 and December 2015 was performed. Demographic parameters, indications for ICD implantation, ICD programming as well as adequate and inadequate ICD therapies were analyzed.

Results:

Data from a total of 37 patients (13 females) could be analysed. Underlying diseases included cardiac channelopathies in 25 patients, various forms of cardiomyopathies in 10 patients and congenital heart defects in 2 patients, respectively. ICD implantation was for primary prevention of SCD in 11 (29.7%) patients and for secondary prevention in the remaining 26 (70.3 %). Single chamber systems were implanted in 27 (73%) and dual chamber systems in 10 (27%). At implantation, mean age was 5.4 years (0.2-11.6) years, mean body weight was 20 (4.6-42) kg. In all patients VF detection zones were set to 240-260 ms, whereas VT detection was inactivated in all patients. Initial detection was at 24-30 cycles whereas redetection was 9-12 beats. During mean follow-up of 4.9 (0.7-11.4) years, appropriate shocks were documented in 11 patients (primary prevention n=1, secondary prevention n=10; n.s.). Inappropriate shocks due to T wave oversensing (n=1), rapidly conducted atrial tachycardia (n=2) and lead dislocation (n=1) were observed in 4 patients (10.8%). 22 surgical revisions were performed in 13 patients (35.1%) due to malfunction of the ICD. At the time of data assessment all 37 patients were alive.

Conclusions:

EC-ICD was effective and safe for avoiding SCD in infants and young children. Inadequate discharges were in a range as previously reported. Surgical revisions were frequent.