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Low incidence of inappropriate shock in children with implantable cardioverter defibrillator. A single-institution experience.

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Introduction
Inappropriate shock of implantable cardiovecter defibrillator (ICD) is known to be more frequent in pediatrics, secondary to high incidence of lead failure, sinus or atrial tachycardia and over sensing in this population.
Methods
We report a single-institution experience of IDC implantation in children. Between January 2003 and December 2010, 24 ICD implantations were performed at mean age of 11 years (range 4.5 to 16), and mean weight of 37 kilograms (from 19 to 60). Indication was secondary prevention for 14 patients (58%) and primary prevention for 10 (42%). Twelve patients had primary electrical diseases, 9 cardiomyopathies, 2 had prior surgical repair of a congenital cardiac defect and one had cardiac tumor with inducible ventricular fibrillation. Implantation was performed transvenously for 10 patients. The 14 others, fewer than 40 kilograms of weight, had epicardial pace-sense leads, with ICD coil in the pleural space and device placed horizontally under the heart. Majority of the ICD receivers (80%) were on high dosage of beta-blockers. All, but one, had a tachycardia detection rate over 200 beats per minute.
Results
At midterm follow-up, mean 28 months (± 26 months), only two patients received inappropriate shocks (8%), while 9 received appropriate ICD therapy (37%). Three patients had lead failure: a coil migration, an undersensing epicardial lead and an insulation break. Among those failing leads, one was placed transvenously and 2 by nonstandard approach. There was one intraoperative fatality reported on a 5 years old girl with restrictive cardiomyopathy, and another at adult age after heart transplant.
Conclusion
Incidence of inappropriate shocks, and lead failure could be effectively decreased by nonstandard placement in children under 40 kilograms, by beta-blockers medication and by personalized programing as reported in this series.