



Implantable cardioverter defibrillator in paediatric patients

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This editorial refers to 'Midterm experience with implantable cardioverter-defibrillators in children and young adults' by A. Çeliker et al., doi:10.1093/europace/euq340

The article by Celiker et al.¹ adds a further experience to a very challenging clinical problem: the primary and secondary prevention of sudden cardiac death in children and adolescents with implantable cardioverter defibrillators (ICDs). As no randomized ICD trials in this population are available, treatment protocols have to be extrapolated from the results of ICD studies in adults. However, children differ from adults in many ways and make this therapy much more complicated. Children are smaller and lighter, as well as having smaller veins and heart chambers and lesser subcutaneous tissue to host thick ICD leads and voluminous generators. Children are growing and therefore, during primary implantation, for example, reserve loops of the leads have to be built, to avoid early re-operations. In children, ICD therapy is projected to last for many years and battery life has to be more long-lasting whereas there is a demand for a very small case volume. Furthermore, children have much more complicated and heterogeneous cardiac disease, congenital birth defects and could have had previous complicated heart surgery.

Moreover, significant psychological work has to be done to communicate with these little patients and their parents to build a positive therapeutic relationship. As children are more active and have higher heart rates than adults, one would expect problems from inadequate shocks.

In this regard, the authors describe that ICD therapy in young patients is possible and effective. Of interest is that implanters injected contrast in peripheral veins to visualize the subclavian veins to allow a targeted puncture. The major problems during follow-up were inappropriate shocks in about 25%, lower than

reported in other studies, in which these numbers went up to 50%. However, 25% is still a high percentage and has to be further reduced, possibly by the use of new antitachycardia pacing algorithms, antitachycardia pacing during charging, etc.² Appropriate programming of the device can help avoiding T-wave oversensing and detecting sinus tachycardia.

Hardware complications of ICDs in children were mostly related to the intravascular lead material in 18% in this series. Any new technology avoiding these potentially dangerous materials in the vascular bed is very welcome and in this regard a fully subcutaneous ICD is on the horizon.^{3,4} Randomized studies with this device against conventional ICDs in children should be performed.

In summary, ICD therapy in children is effective, but challenging, and should be performed only in specialized centres of some expertise.

An inclusion of all those cases in prospective registries to gain more data would be desirable.

Conflict of interest: none declared.

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