Remote monitoring of cardiac implantable devices in children: characteristics and outcome in a retrospective single centre contemporary study. TelePaedia study

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Funding Acknowledgements: None.

Introduction: Remote monitoring (RM) has revolutionized implantable cardiac device care in adults. It has demonstrated its safety on hard criteria, a reduction in the number of hospitalizations and emergency room visits, early detection of events and a reduction in inappropriate therapies. However, while pediatric population is becoming emerging, particularly considering congenital heart diseases, there is no contemporary study.

Objective: The aim of our study was to characterize in our cohort of RM patients the population of children (below 18 yo) implanted with a pacemaker or an ICD and under RM for more than 1 year.

Method: The data collection was carried out retrospectively within the cohort of RM patients at our university hospital. The outcome combined occurrence of ventricular (VT)/supraventricular (SVT) arrhythmias, appropriate or inappropriate therapies, lead dysfunction/fracture and ERI.

Results: The study population included 34 patients (17F/17M) with a mean age of 9.4 +/- 5.8 years (range 0-18 yo) and a mean remote follow-up of 4.6 +/- 3.9 years (range 1-13 y). The indications for pacing were postoperative atrioventricular block (AVB, n = 9) for operated congenital heart disease or hypertrophic cardiomyopathy (n = 1), congenital AVB (n = 5), muscular dystrophy (n = 1) and genetic sinus node dysfunction (n = 1). Indications for an ICD were resuscitated sudden death in hypertrophic cardiomyopathy (n = 4), LQTS (n = 5), CPVT (n = 2), arrhythmogenic right ventricular dysplasia (n = 2), Brugada syndrome (n = 1) and congenital heart disease (n = 2). Pacing devices (n = 17) were mostly implanted with epicardial leads and abdominal box (n = 12). ICDs (n = 18) were implanted in primary (n = 4) or in secondary prevention with epicardial (n = 2)/endovascular (n = 9)/subcutaneous (n = 2) leads depending on children weight and anatomy. One 12 yo-boy had an S-ICD in addition to a previous pacemaker. There were a total of 13 patients with device-triggered alerts: VT in 8 including appropriate therapies in 6 and inappropriate shocks in 2, supraventricular tachycardia in 2, RV lead dysfunction in 2, RV lead fracture in 1 and no alert for ERI. All alerts were treated within 24h.

Conclusion: This is the first report of cardiac device remote monitoring in a pediatric population. In our population 13/34 patients experienced alerts necessitating intervention over a mean 4.6 year-follow-up. Remote monitoring through device-triggered alerts allowed efficient treatment of an arrhythmic event or a lead dysfunction. This is a preliminary study suggesting the need for further studies on a larger population. Remote monitoring should be considered in all eligible-device children and should be considered as standard of care.