Pacemaker Longevity; a small cost for safety on the young with pacemaker dependence

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Introduction: Children with pacemaker dependence (PD) remain a concerning group of patients because of the risk of sudden death should pacemaker failure occur. Our management policy has been to keep ventricular outputs 5.0V at 0.5ms and 3 monthly check ups. Some patients are managed with two ventricular leads using CRT devices.

Methods: Retrospective database review was undertaken on patients attending a single institution between January 1997 and April 2019. We reviewed our pacemaker database to look at the effects of longevity on this policy. Pacemaker dependence was defined as the absence of underlying escape rhythm > 30/minute at least one pacemaker check.

Result: Over the study period a total of 120 children with epicardial pacemakers were followed. All but one patient had ventricular capture management turned off. Early in the series, one patient with permanent PD aged 12 years, paced for iatrogenic post-operative AV block after surgery died suddenly, presumably from loss of capture. This patient had ventricular capture management turned on. Since then we have not used capture management. Total of 71 patients had battery replacement. Of these 16 (22%) were PD of which 11 (15%) had battery replacement and 104 patients (78%) were pacemaker non dependent (PND) of which 60 patients (85%) had battery replacement. In the pacemaker dependent group 2 patients (18%) had 3 battery replacement, 5 patients (46%) had 2 battery replacement and 4 patients (36%) had 1 battery replacement. Mode of pacing was DDD in all 11 patients in pacemaker dependent (PD) group out of which 6 patient upgraded to BiV pacing for safety reason. In the pacemaker non dependent (PND) group 2 patients (3%) had 3 battery replacement, 12 patients (20%) had 2 battery replacement and 46 patients (77%) had 1 battery replacement. Mode of pacing was DDD/R in 35 patients, VVI/R in 10 patients, AAI/R –DDD/R in 3 patients, VDD in 1 patient and ADIR in 1 patient. Upgraded to BiV in 3 patients. Pacemaker longevity in the pacemaker dependent group was 24 – 108 months with median 60 months. In the pacemaker non dependent (PND) group pacemaker longevity was 14 – 108 months with median 84 months.

Conclusion: Our policy has been effective and resulted in a decrease in longevity of median 60 months in pacemaker dependent (PD) group compared to median 84 months in the pacemaker non dependent (PND) group.