Premature Ventricular Contractions in Healthy Children: does the burden of ectopy matter?

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Background: Premature ventricular contractions (PVCs) are a common finding in healthy children. Whereas a burden of ventricular ectopy higher than 20% in adults with normal hearts was found to increase the risk of cardiovascular events and LV dysfunction, there is little knowledge about the consequences of frequent PVCs diagnosed in a healthy child.

Methods: We reviewed 24h-Holters performed at our institution (2008-2012), and identified patients with structurally normal hearts and a burden of PVCs ≥ 10% of total beats on any Holter during follow-up. Demographic data were collected and trans-thoracic echocardiography (TTE), ECG and 24h-Holters at each evaluation were reviewed.

Results: A total of 47 patients (22 female; mean age 8.2±6.5 y) had 19.2 ± 10.3% PVCs recorded on initial 24h-Holter. Left bundle branch morphology was dominant in 33/45 (73%). No evidence of severe cardiomyopathy was found on initial TTE with mean shortening fraction (SF) Z-score of 0.1±2.0. Yet, 7 patients (14.9%) had decreased SF (Z-score: -2.4 to -4). On initial ECG, mean PVC coupling interval was 431.9±110.5ms, and mean PVC width was 118.6±27.1msec; runs of non-sustained or sustained ventricular tachycardia (VT) were present in 3 (6.4%) patients. On 24h-Holter, PVCs were monomorphic in 44/47 (93.6%), ventricular bigeminy was recorded in 26.9± 29.2% of the total PVC time in 37/47 (78.7%) patients. SF Z-score was worse in cases with shortest coupling interval and with higher 24h PVC proportion (figure 1). A similar trend was noted between the percentage of ventricular bigeminy and SF Z-score. During follow-up (3.9±2.3 yrs) no death occurred, and a significant decrease in PVC burden was observed (from 19.2 ± 10.3% to 7.7±11.1%; p<0.001) coupled with a trend towards improved systolic function (SF Z-score from 0.11±2.04 to 0.69±1.9; p=0.11). Three patients with sustained runs of VT underwent successful PVC ablation. On final Holter, 19/47 (40%) patients had <1% PVCs.

Conclusions: PVCs seem to be a benign finding in children with structurally normal hearts, with no reported death or severe cardiomyopathy in this small series. Yet, mild LV systolic dysfunction is observed in some patients, correlating with a higher burden of ectopy.