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Heart rate turbulence in children with ventricular premature beats

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Heart rate turbulence (HRT) has recently described as a strong, independent risk stratifier in postinfarct patients. The aim of this study was to investigate significance of HRT in children with ventricular premature beats (VPB).

Methods: HRT analyses (turbulence onset — TO and turbulence slope — TS) were performed in 65 children, 31 boys and 34 girls (mean 8 ± 7.5 years) with VPB during Holter monitoring (HM), 20 of them (30.8%), had syncope. There were 46 children without evidence heart disease (2 had syncope), 3 children with long QT syndrome (all had syncope), 7 — catecholaminergic bidirectional ventricular tachycardia — CBVT (all had syncope), 1 — arrhythmogenic right ventricular dysplasia (syncope), 1 — Brugada syndrome (no syncope), 1 — short QT syndrome (syncope), 5 with dilated cardiomyopathy — DCM (all had syncope), 1 — idiopathic ventricular fibrillation (syncope). 1678 VPB were analyzed. We have calculated TO in all children (100%) and turbulence slope (TS) in 19 children (29.2%). Measures of HRT analysis were used as previously described by Shmidt et al. (1999). During the follow-up period (6 ± 4.9 years) 26 (43%) patients had adverse passing of disease: syncope, progressive heart failure, tolerance towards antiarrhythmic treatment, 7 children had sudden death (1 children with DCM suddenly died during HM).

Results: Abnormal results TO (TO > 0) were found in all patients with CBVT (0.24 ± 5.6), all patients with DCM (0.27 ± 19.8) and 4 patients without evidence heart disease (2 among this children were having syncope and tolerance towards antiarrhythmic treatment). The sensitivity and specificity for prediction of syncope and sudden death were 27% and 97% accordingly. TS < 2.5 ms per RR interval has defined only in the patient with DCM, who died during HM. We haven't found relationship between TO and TS ($r = -0.057$).

Conclusion: Abnormal measures TO are revealed in children with heart disease. TS < 2.5 ms per RR interval may be used as a relatively specific tool for risk stratification of sudden death in children with heart diseases.