Using of the 12-lead electrocardiogram to determine the site of ventricular arrhythmia in children.

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Introduction.

There are a number of studies focusing on determining the site of ventricular arrhythmia (VA) origin. However, electrocardiographic (ECG) patterns of VA for children have not been reported yet. The goal of the study was to determine the ECG characteristics of the most common sites of VA in children.

Methods and materials.

12-lead ECG of 246 children aged from 5 to 17 years (mean age 13.4±3) with VA were investigated. The origin of VA was confirmed during the endocardial mapping. ECG characteristics of ventricular complexes such as QRS axis, the QRS morphology, the ratio of R and S waves in precordial leads, the QRS duration in II and V2 were assessed.

Results.

According to endocardial mapping VA originated from right ventricular outflow tract (RVOT) in 58.5% patients (pts), left aortic sinus of Valsalva (LVS) in 17.9% pts, right ventricular inflow tract (RVIT) in 12.6% pts. Other loci had 11% of patients. RVOT loci characterized with both normal and right axis deviation. The morphology of QRS in this group was QS or rS/RS in V1, RsS in V3, amplitude of R wave ≤ 30 mm in lead III and QRS duration ≥ 120 ms in II. The ECG morphology of LVS showing only inferior axis together with Rs or rS/RS pattern in V1 and R>S in V3, amplitude of R wave > 30 mm in lead III. The origin in RVIT was associated with left axis deviation of ventricular complex, RS or rS/QS pattern in V1 and QRS duration > 120 ms in V2.

Conclusion.

The origin of ventricular arrhythmia using surface ECG can be localized with the accuracy 91%.