

Assessment of Microvolt T-wave Alternans in Repaired Tetralogy of Fallot Patients with 24-hour Holter Electrocardiography

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Objective: In this retrospective study, we aimed to examine microvolt T-wave alternans (MTWA) in Holter electrocardiography (ECG) of children with repaired tetralogy of Fallot (TOF) to assess risk of sudden death and ventricular arrhythmias. We tried to define correlation between MTWA and electrocardiographic, echocardiographic parameters, heart rate variability (HRV) as well.

Methods: Holter ECG records and archive files of 56 patients with repaired TOF were analyzed.

Subjects' ECG parameters, HRV and MTWA values were compared with a control group with similar age and gender distribution.

Results: Thirty-five subjects (%62,5) were male and 21 (%37,5) were female. Mean age was $123,4 \pm 48,3$ months. All patients underwent total correction operation and eight (%14,3) patients had Blalock-Taussig shunt procedure before total correction. There was significant difference between patient and control groups, in terms of QRS duration, median QT dispersion, maximum and minimum mean duration of QT and QTc. We found RBBB in 37 patients (%66), monomorphic premature ventricular contractions in 8 (%14,3) and non-sustained ventricular tachycardia in 1 (%1,8). All HRV parameters except LF/HF ratio were found to be significantly lower in patient group than in control group. LF/HF ratio was significantly higher in patient group. Median MTWA value was $55,5 \mu\text{V}$ in the control group whereas $95,5 \mu\text{V}$ in patients group. MTWA was found to be significantly higher in patient group. A significant positive correlation was found between presence of premature ventricular contractions and tricuspid regurgitation; SDNN, SDNNi, TP, VLF and RV dilatation; SDNNi, TP, VLF and QRS duration; SDNN, SDNNi, rMSSD, pNN50, TP, VLF, LF, HF and maximum QT; SDNNi, rMSSD, pNN50, TP, VLF, LF, HF and minimum QT; SDNNi, TP, VLF, LF and QT dispersion. There was no correlation between HRV parameters, echocardiographic findings and MTWA.

Conclusions: HRV was reduced and MTWA was increased in children with repaired TOF. HRV and MTWA are significant markers of ventricular arrhythmias and sudden death. Predictions about future RV diameters, functions, likelihood of ventricular arrhythmias and sudden death may be made by evaluating HRV parameters and MTWA, and thus need for closer follow-up can be defined.