Quantitative repolarization differences predict Kawasaki disease while atrio-ventricular depolarization differences predict coronary artery anomalies

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Introduction: Kawasaki disease (KD) is the leading cause of acquired heart disease in children. 12-lead electrocardiogram (ECG) changes in patients during the acute phase of KD include flattened T-waves and prolonged corrected QT-intervals (QTc). We set out to determine the most accurate 12-lead ECG and VCG predictors for identification of patients with KD and which of these predictors would be clinically useful for early identification of those with coronary artery anomalies (CAA).

Methods: A blinded, retrospective case control study of patients with KD and age-/gender-matched controls was performed. Deep Qwaves, corrected QT-intervals (QTc), spatial QRS-T angles, principle T-wave component vector (RMS-T) and spatial P-R angles (SPR angles) were assessed. Student t-tests, Chi square and Analysis of Variance were used to identify significant differences between groups.

Results: Fifty patients with KD (mean age 3.1±3.1 years, 26% female) were compared to fifty control patients (mean age 3.8±2.9 years, 44% female). Of the KD patients, 32 (64%) were diagnosed as atypical KD and 28 (56%) of them had CAA. KD patients were significantly differentiated from control patients by deep Q waves (72% vs. 44% p=0.005), QTc values (395.1±24.7ms vs. 410.4±34.7 ms, p=0.013), and the RMS-T (4.2±0.2dmV vs. 6.3± 0.3 dmV p≤0.001) respectively. Atypical KD was also discriminated from controls with an odds ratio or 22.3. The spatial P-R angle significantly discriminated CAA from those without.

Conclusion: The RMS-T differentiates KD is typical or atypical from controls. Kawasaki patients with coronary artery anomalies were differentiated from those without coronary changes by the SPR angle.

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Improved mid-term pulmonary valve competence following valve-sparing repair (anterior cusp patch augmentation) in Tetralogy of Fallot

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Purpose: To determine whether patch augmentation of the anterior cusp of the pulmonary valve allows for valve-sparing repair in patients with more severe pulmonary stenosis and improves mid-term valve function following Tetralogy of Fallot (TOF) repair.

Methods: Clinical data for all patients who underwent repair of TOF with pulmonary stenosis between 1/2010 and 5/2012 at a single institution were retrospectively reviewed. An anterior cusp augmentation technique using a biological patch was performed in patients who were not candidates for pulmonary valvotomy alone. Echocardiographic measurements of pulmonary valve and right ventricular function were analyzed at termination of bypass, at discharge and at latest follow-up. Patients were categorized by type of repair: no valve intervention (No), pulmonary valvotomy (PV), patch augmentation (Paug) and transannular patch (TAP). After evaluating all groups for preoperative clinical characteristics, the Paug and TAP groups had similar values and pulmonary valve z scores. Outcomes for these two groups were therefore compared.

Results: All patients survived and there were no major complications. Each group was homogeneous with regard to baseline patient characteristics. Baseline characteristics of Paug and TAP groups were similar, suggesting that in selected patients, cusp augmentation was used in place of transannular patch. While 100% of TAP patients showed more than moderate PR at last follow up echocardiogram, only 39% of Paug Patients showed more than moderate PR.

Conclusions: Using a patch augmentation technique, 61% of patients who would have otherwise received a TAP have a competent valve in a mid-term follow-up. Longer follow-up is necessary to ascertain the durability of this technique.

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