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Electrocardiographic Changes in the Pediatric Patients with Symptomatic Rejection after Heart Transplantation

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Introduction: Many studies have defined rejection as a clinical event in which temporary augmentation of immunosuppression is initiated to treat presumed acute rejection. Endomyocardial biopsy remains the gold standard of diagnosis of acute cellular rejection after heart transplantation. However, biopsy is not always diagnostic and is also risky to critical patients. In this study we considered possibility of non-invasive diagnosis of acute symptomatic rejection using electrocardiography in pediatric patients after heart transplantation.
Methods: Records of patients having undergone heart transplantation were reviewed focusing specifically on surface ECGs performed in temporal proximity to symptomatic acute rejection episodes.
Results: 65 pediatric patients after heart transplantation were evaluated and 20 patients had episodes of acute symptomatic rejection. Surface ECGs within one or two days of events were analysed. Most prevalent finding was low QRS voltage in 16 patients and there were no recorded low voltage in patients without episode of significant rejection. Right bundle branch block was more frequent when comparing those with and without significant rejection. The mean QTc at the rejection was significantly increased compared with that of before episode of rejection(525±40 vs 469±18 ms, $p<0.001$). The mean QTc before episode of rejection in patients with clinical rejection was also significantly increased compared with that of patients without rejection(469±18 vs 453±32 ms, $p=0.01$). The QTc difference between before and at the rejection was larger when comparing those between last follow-up and at one year after transplantation in patients without rejection(60±32 vs 10±27 ms, $p<0.001$). However, the QTc difference between before rejection and at one year after transplantation was not significantly different from those between last follow-up and at one year after transplantation in patients without rejection(23±24 vs 10±27 ms, $p>0.05$).
Conclusions: In this study, low QRS voltage and increasd QTc were important surface ECG findings in the patients who have experienced clinically significant rejection.