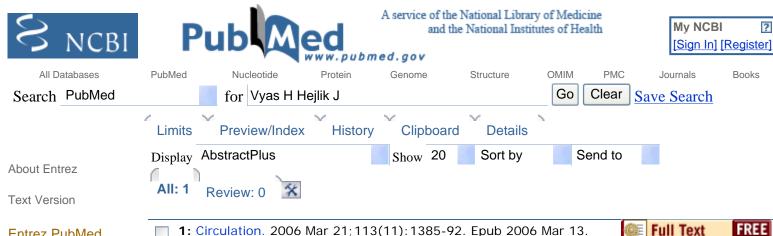
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Epinephrine QT stress testing in the evaluation of congenital long-QT syndrome: diagnostic accuracy of the paradoxical QT response.

Vyas H, Hejlik J, Ackerman MJ.

Division of Pediatric Cardiology, Department of Pediatric and Adolescent Medicine, Mayo Clinic College of Medicine, Rochester, MN, USA.

BACKGROUND: A paradoxical increase in the uncorrected QT interval during infusion of low-dose epinephrine appears pathognomonic for type 1 long-QT syndrome (LQT1). We sought to determine the diagnostic accuracy of this response among patients referred for clinical evaluation of congenital long-QT syndrome (LQTS). METHODS AND RESULTS: From 1999 to 2002, 147 genotyped patients (125 untreated and 22 undergoing beta-blocker therapy) had an epinephrine QT stress test that involved a 25-minute infusion protocol (0.025 to 0.3 microg.kg(-1).min(-1)). A 12-lead ECG was monitored continuously, and repolarization parameters were measured. The sensitivity, specificity, and positive and negative predictive values for the paradoxical QT response (defined as a > or = 30-ms increase in QT during infusion of < or =0.1 microg.kg(-1).min(-1)epinephrine) was determined. The 125 untreated patients (44 genotype negative, 40 LQT1, 30 LQT2, and 11 LQT3) constituted the primary analysis. The median baseline corrected QT intervals (QTc) were 444 ms (gene negative), 456 ms (LQT1), 486 ms (LQT2), and 473 ms (LQT3). The median change in QT interval during lowdose epinephrine infusion was -23 ms in the genenegative group, 78 ms in LQT1, -4 ms in LQT2, and -58 ms in LQT3. The paradoxical QT response was observed in 37 (92%) of 40 patients with LQT1 compared with 18% (gene-negative), 13% (LQT2), and 0% (LQT3; P<0.0001) of the remaining patients. Overall, the paradoxical QT response had a sensitivity of 92.5%, specificity of 86%, positive predictive value of 76%, and negative predictive value of 96% for LQT1 status. Secondary analysis of the subset undergoing beta-blocker therapy indicated inferior diagnostic utility in this setting. CONCLUSIONS: The epinephrine QT stress test can unmask concealed type 1 LQTS with a high level of accuracy.

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