

### QTc and QTd Changes after Cardiopulmonary Bypass Surgery in Children

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**Objectives:** The aim of the study was to assess the impact of cardiopulmonary bypass surgery on corrected QT (QTc) and QT dispersion (QTd) intervals. The possible role of inflammation on these variables was investigated.

**Background:** Systemic inflammation and altered myocardial repolarization are common consequences of cardiopulmonary bypass surgery.

**Methods:** Electrocardiograms (ECGs) were registered and C-reactive protein (CRP) as well as white blood cell (WBC) count were measured in 36 children with ventricular septal defect (VSD) or atrial septal defect (ASD) one day before and 5 days after surgery. QTc and QTd were calculated.

**Results:** QTc increased after surgery in 24 (67%) patients (mean  $\pm$  SD =  $31 \pm 25$  ms, range = 7 to 125); whereas QTc decrease was noted in 8 (22%) patients ( $28 \pm 28$  ms, range = 1 to 77). After surgery, QTc was abnormally (increments in the QTc above the upper limit of normal) prolonged in 8 (22%) patients ( $461 \pm 18$  ms, range = 445 to 487). Only one of these 8 patients had abnormally prolonged QTc before surgery.; Abnormally prolonged QTc returned to normal in 3 of the 4 patients with pre-operatively prolonged QTc. A trend for increased QTd was also noted. The changes did not correlate with CRP, WBC count, bypass time or aortic cross-clamp time.

**Conclusions:**

Twenty-four (67%) of the 36 patients had a post-operative increase in QTc; only 8 of these 24 patients had impaired myocardial repolarization (increments in the QTc above the upper limit of normal).

Similarly, 8 (22%) of the 36 patients had a post-operative decrease in QTc. CRP and WBC had no clear correlations with the post-operative ECG changes. Although post-operative QTc changes were common, their natural history and clinical significance remain uncertain.