QRS PROLONGATION DOES NOT PREDICT MALIGNANT VENTRICULAR ARRHYTHMIAS AND SUDDEN DEATH IN PATIENTS FOLLOWING NEONATAL TETRALOGY OF FALLOT REPAIR

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Background: A QRS duration on the resting ECG of ≥180 milliseconds (msec) has been previously reported to be the most sensitive predictor of life-threatening ventricular arrhythmias after tetralogy of Fallot (TOF) repair. The significance of QRS duration in predicting malignant ventricular arrhythmias and sudden death after neonatal TOF repair has not been previously described.

Methods: A retrospective observational study of children undergoing TOF repair in the first month of life at a single free-standing children’s hospital between 1991 and 2010 who survived to hospital discharge and had at least 12 months of follow-up was undertaken. Subject data were reviewed including demographic data, electrocardiograms, and clinical course.

Results: The study population included 111 subjects accounting for 968 person years of follow-up time. Median QRS duration was 118 msec (IQR: 90-140 msec). Sudden death occurred in 4 subjects (3.6%) with all-cause mortality of 13.5% (n=15). The most recent QRS duration in those subjects who died suddenly (92.0+/−39.4 msec 95% CI: 29.3-154.7) was not significantly different from those who did not (116.9+/−29.5 msec 95% CI: 111.2-122.5 msec p=0.104). A QRS duration greater than or equal to the study population median was not associated with increased rate of sudden death (Fisher’s exact test p = 0.096). QRS duration did increase significantly with follow-up time (p<0.001 r²: 0.242 beta: 2.7).

Conclusion: Prolonged QRS duration did not predict sudden death or malignant ventricular arrhythmias in subjects who underwent neonatal repair of tetralogy of Fallot. Investigation of other risk factors is warranted in the current era of surgical repair of TOF.