

Presented at the ACMT Annual Scientific Meeting 2023 – San Diego, CA

Published in J Med Toxicol 2023;19(2):98-99.

### **077. QRS Widening As a Risk Factor for Adverse Cardiovascular Events in Bupropion Exposures: A ToxIC Registry Study**

Michael D Simpson, Michael C Monuteaux, Michele M Burns; On behalf of the Toxicology Investigators Consortium (ToxIC)

*Boston Children's Hospital, Boston, MA.*

**Background:** QRS widening on electrocardiogram (ECG) is associated with adverse cardiovascular events (ACVE) in sodium channel blockade. Bupropion toxicity causes QRS widening via the blockade of gap junctions, and it is unknown whether QRS widening in this setting is associated with ACVE.

**Hypothesis:** QRS widening independently predicts ACVE in single substance bupropion exposures.

**Methods:** This is a retrospective analysis of the Toxicology Investigators Consortium (ToxIC) registry. We included acute and acute-on-chronic single substance bupropion exposures in adults (19 years or older) from January 1st, 2010 to December 31st, 2021. Patients with signs/symptoms marked as “Unlikely related” to exposure were excluded. The independent variable was QRS widening (> 120 ms). The primary outcome was ACVE, defined as the presence of any of the following: 1) Ventricular dysrhythmia, 2) Treatment with vasopressors, 3) Myocardial injury, or 4) Cardiac arrest, defined as treatment with cardiopulmonary resuscitation (CPR) or death during hospitalization. To test the association between QRS widening and ACVE, we conducted a propensity score matched analysis to adjust for the following potential cofounders, selected a priori: age, seizures, tachycardia (>120 bpm), and QTc prolongation (>500 ms). Patients with and without QRS widening were matched using a 1:1 nearest neighbor approach.

**Results:** We identified 416 cases for analysis. 410 (98.6%) were 19 – 65 years old; 229 (55.1%) were female. 18 (4.33%) patients had QRS widening; 16 (3.85%) patients experienced ACVE. The standardized mean differences of all covariates between matched patients were <10%, reflecting excellent balance. We found a non-significant estimate that risk of ACVE would be 8.2% greater if all patients had QRS widening than if no patients had QRS widening (Average Effect 8.2%, 95% CI 6.6% - 23.1%, p = NS).

**Conclusion:** QRS widening was not independently predictive of ACVE in bupropion exposures; further research with larger sample sizes is needed.