Factors Associated with Seizures in Bupropion Overdose: a 3- Year Review of the ToxIC Registry

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Background: Bupropion is a phenylethylamine antidepressant pre- scribed for depression, seasonal affective disorder, and smoking cessa-tion. In overdose, it produces a variety of clinical effects, often consistent with sympathomimetic toxicity. Seizures occur in up to 30% of overdoses and may occur as late as 24 h post-ingestion of sustained- or extended- release formulations. It is currently not possible to predict which patients with bupropion overdose may have a seizure. We sought to determine what clinical signs and symptoms or demographics are associated with seizures in bupropion overdose. This is a pilot study to determine associations that may be used to formulate a predictive model.

Question: What clinical features are associated with seizures in bupropion overdose?

Methods: This is a retrospective review of the ToxIC database. It was queried from January 2014 to 2017 for cases with bupropion listed as a Bprimary agent^ contributing to patient toxicity. Cases were excluded if the patients were < 13 years old or if there was at least one other primary agent.

Results: Seven hundred fifty-two cases were identified, with 260 cases remaining after exclusion criteria. Seizures occurred in 35.4% of cases, which is consistent with previous studies. A number of clinical features were found to be significantly associated with seizures: prolonged QTc (OR 3.29 CI 1.47–7.42), prolonged QRS (OR 7.3 CI 1.52–35.12), tachycardia (OR 1.69 CI 1.02–2.82), and hypotension (OR 16.43, CI 2.05–131.76). The following clinical features were not significantly associated with seizures: agitation (OR 0.89 CI 0.52–1.54), CNS depression (OR 1.73 CI 0.88–3.41), hyperreflexia (OR 0.98 CI 0.55–1.77), male sex (OR 1.0 CI 0.61–1.63). Sixty-two percent in both groups had a numerical QTc recorded. Average QTc was 482 ms in the seizure group vs 454 ms in the no-seizure group. Conclusion: Seizures occur in 35% of bupropion overdoses and are associ- ated with prolonged QT and QRS, tachycardia, and hypotension. Mean QTc was longer in the seizure group. Chronology of symptom onset and seizures is not possible with this dataset and requires future study. In our study, ECG findings and vital sign abnormalities were associated with seizures, suggest- ing that further study into these findings as predictors of seizures is warranted.