

Single Agent Bupropion Overdose: Effects as Reported in the ToxIC Registry

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Introduction: Bupropion, a monocyclic phenylethylamine antidepressant, is the only FDA-approved synthetic cathinone. It increases the release of norepinephrine in the locus coeruleus and dorsal raphe which leads to an increase in the frequency of serotonergic neuron firing. The diagnosis of serotonin syndrome (SS) from bupropion poisoning is controversial due to the lack of direct serotonergic activity. Nonetheless, there is one documented report of SS after single agent bupropion overdose.

Methods: This is a qualitative analysis of the clinical effects from single-agent bupropion overdose and characteristics associated with patients who developed SS versus the ones who did not. The data were obtained from the Toxicology Investigators Consortium (ToxIC) registry between 01/01/2014 and 12/31/2017. Categorical variables were described as percentages with 95% confidence intervals. Odds ratios and 95% confidence intervals were computed using logistic regressions for binary variables and an ordinal logistic regression for Hunter's criteria.

Results: There were 266 single-agent bupropion ingestions recorded; of these, 170 (63.9%) were female and 179 (67.3%) Caucasian. The most common symptoms were seizures ($n = 104$, 39.1%), agitation ($n = 72$, 27.1%), toxic psychosis ($n = 45$, 16.9%), and myoclonus/tremor/hyperreflexia ($n = 42$, 15.8%). Benzodiazepines were the most common therapy ($n = 159$, 59.8%). There were 13 (4.9%, 95% CI = 2.8–8.3%) patients diagnosed with SS as listed in the registry by the medical toxicology physician who evaluated the patient at the bedside. Age, race, ethnicity, and gender were not associated with the diagnosis of SS, nor were seizures, agitation, or toxic psychosis. The only symptom associated with the diagnosis of SS was myoclonus/tremor/hyperreflexia (OR = 10.52, 95% CI = 3.25–34.1).

Conclusion: Bupropion is associated with seizures, agitation, toxic psychosis, and myoclonus/tremor/hyperreflexia. It is the sole cause of SS in 5% of patients reported in ToxIC. The only characteristic associated with the diagnosis of SS was myoclonus/tremor/ hyperreflexia.