Coma and absent brainstem reflexes are used to determine brain death.
Case reports demonstrate intoxication with drugs like baclofen and phenobarbital can mimic brain death.
One previous report describes dilated pupils and EEG burst suppression after bupropion overdose with measured bupropion level of 1441ng/mL (50-100) and hydroxybupropion level of 3342ng/mL (600-2000).
Bust suppression on EEG has also been associated with poor neurologic outcomes after head trauma, stroke, respiratory arrest and reported after phenobarbital and opioid overdose.
We present a patient with coma, absent corneal and pupillary reflexes following massive bupropion ingestion. Quantitative levels were obtained.
Bupropion toxicity may mimic brain death with coma and absent brainstem reflexes.

Case Report

32 yo man found unresponsive after reported ingestion of 180 tablets of 150 mg extended-release bupropion.
Bystanders initiated CPR prior to EMS arrival.
PEA arrest was confirmed, ACLS protocol initiated, intubation performed, and ROSC was achieved.

Case Report Continued

Epinephrine and norepinephrine infusions were initiated for refractory hypotension.
Flumazenil and naloxone were administered and the patient developed tonic-clonic seizure activity that ceased after 4mg IV lorazepam.
Patient was transferred to the toxicology service at a tertiary care center.
Exam on admission revealed coma, fixed/dilated pupils without oculocephalic, corneal, or gag reflexes - No sedatives or paralytics had been given for hours.
EEG showed diffuse suppression and slowing of background activity.
Therapeutic hypothermia was initiated.
On hospital day (HD) 2, posturing and non-purposeful movements were noted and controlled with propofol infusion.
Pupils were became reactive on HD 3.
Neurologic exam gradually improved, he was extubated on HD 5 and discharged without appreciable motor or cognitive deficits on HD 11.
Bupropion level was 5898.8 ng/mL (50-100) and hydroxybupropion was 3521.8 ng/mL (600-2000).
No other drugs known to mimic brain death were present on GC/MS urine drug testing.

Discussion

Bupropion toxicity causes seizures, status epilepticus, cardiotoxicity, and cardiopulmonary arrest.
There is one published report of absent brainstem reflexes attributed to bupropion toxicity.
Our case is similar with coma and absent pupillary and corneal reflexes.
Our patient had diffuse suppression and slowing of background on EEG while the previously reported case showed burst suppression.
Our patient had significantly greater quantitative bupropion and hydroxybupropion levels.
Both patients experienced neurological recovery.
Caution is required when determining brain death following massive bupropion overdose.
Limitations to this case include PEA arrest as a confounder of his initial neurologic examination.

Conclusions

Bupropion toxicity may mimic brain death by causing fixed/dilated pupils with absent corneal, gag, and oculocephalic reflexes.