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Alexis M. Dunn
Jefferson Health NJ

Andrew M. Vasta
Jefferson Health NJ

James A. Espinosa
Jefferson Health NJ

Alan Lucerna
Jefferson Health NJ

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Back From Baclofen: A Case Report of Baclofen Overdose

Alexis Dunn, DO, Andrew Vasta DO, James Espinosa, MD, Alan Lucerna, DO

Emergency Medicine Residency and Department of Emergency Medicine, Jefferson New Jersey

Abstract:

We report a case of a 45-year-old female who presented with intentional Baclofen overdose. The patient was lethargic and then quickly unresponsive and hypotensive, intubated by EMS in the field. By the time the patient was admitted to the Intensive Care Unit (ICU), the patient was clinically brain dead. After several days of supportive care, patient slowly, and miraculously, regained full neurologic functioning and was admitted to the Psychiatric Unit.

Case Presentation:

A 45-year-old female with a past medical history of anxiety, opioid use disorder on Sublocade injection and Suboxone, and asthma presented to the emergency department (ED) with the supposed chief complaint of overdose. Text messages to family members noted that she took 1100mg – 1800mg of Baclofen 2 hours prior to arrival. She was also ethanol intoxicated. She was intubated in route by EMS, initially lethargic and quickly declined to unresponsive. She arrived hypotensive. The patient was given intravenous fluids and started on vasopressors. Family members also confirmed that the patient texted them this as a suicide attempt. Poison Control was contacted in the ED and recommended magnesium and nasogastric tube with activated charcoal. The patient was admitted to the ICU.

When the patient arrived in the ICU, she was not on any sedation or leftover paralytics from rapid sequence intubation. She was fully obtunded, did not respond to any pain and did not have cough/gag reflex. She had a prolonged QTC. EEG was placed due to concern for seizures. For the next several days, patient remained in distributive shock requiring vasopressors. She continued to unresponsive to all noxious stimuli and on EEG had diffuse burst suppression concerning for severe brain injury. We suspected this may be false finding due to the Baclofen and continued supportive care.

On the patient's 3rd day of admission, she spontaneously opened her eyes and was weaning down vasopressor requirement. For the next several days, she had a very slow neurologic improvements. She was eventually extubated, evaluated by the Psychiatry team for suicide attempt, and discharged, walking out of the hospital with very minimal dysfunction to a substance abuse rehab.

Discussion:

The patient presented with Baclofen overdose and the toxicity mimicked brain death for several days, eventually returning full functionality.

Pathophysiology:

Baclofen is a GABA B receptor agonist. GABA B is a presynaptic and postsynaptic receptor found in the spinal cord and brain (Dease, et al). Baclofen works in the spinal cord by binding presynaptically which decreases calcium influx, therefore impairing release of neurotransmitters. Postsynaptically, Baclofen creates potassium efflux and cell hyperpolarization thereby producing and inhibitory effect (Padgett, et al). Overall, this relaxes the muscles surrounding the spine and decreases spasticity. In the setting of a Baclofen overdose, the drug loses specificity for the spinal cord receptors and therefore has a greater effect on the central nervous system (CNS), specifically CNS depression. Severe Baclofen overdoses can therefore lead to paralysis, seizures, and respiratory depression. It can also cause autonomic dysfunction for example hypotension and hypertension, bradycardia and tachycardia. The CNS depression in very severe cases can mimic brain death (CDC).

Figure 1: Baclofen pills that the case patient overdosed on. (Recovered.org)

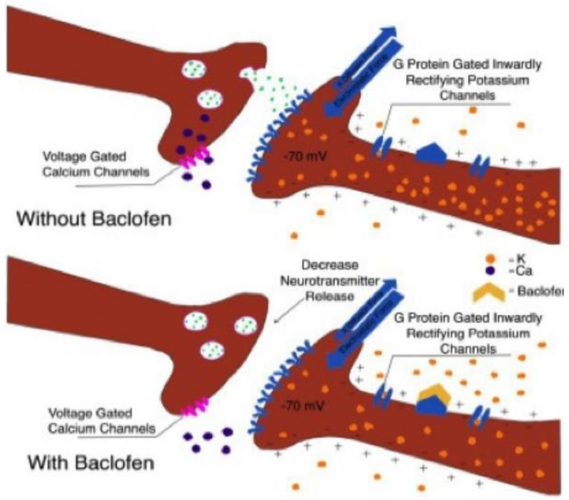

Figure 2: Mechanism of action of Baclofen. (Tamingthesru.com)

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Discussion:

Etiology and Epidemiology:

Baclofen is a synthetic drug derived from the neurotransmitter gamma-aminobutyric acid (GABA). The recommended oral dose for adults is typically 5mg three times per day with a maximum dose of 80mg per day. Baclofen turns into a toxic medication starting with doses greater than 200mg (Dease, et al). Baclofen undergoes renal excretion, making patients with impaired renal function at higher risk for toxicity. Oral overdoses can be very serious, though intrathecal pump errors have shown worse outcomes (Romito, et all). With regard to oral intentional overdoses, the median age was found to be 35 years old, with 56% being women (Leung, et al).

Pharmacokinetics:

Baclofen is rapidly absorbed when taken orally, with peak serum concentration two hours post-ingestion. 80% of oral Baclofen is renally eliminated and the other 20% is hepatically eliminated. Hemodialysis can effectively remove Baclofen. It is lipophilic, meaning there is a redistribution out of tissues which can prolong clearance. The half-life is about 3.5 hours. In the setting of a Baclofen overdose, the half life can be prolonged (Dease, et al). In a case report, there was a 36-hour half life documented in a Baclofen overdose of 450mg (Ghose, et al).

Evaluation:

History and physical should be obtained immediately on arrival; friends/family can help if patient is altered. Point of care glucose should be checked with altered mental status. Laboratory studies should be drawn including complete blood count, basic metabolic panel (emphasis on creatinine), hepatic function, creatine kinase, urinalysis, salicylate level, acetaminophen level, and urine drug screen. Polypharmacy overdose should be on the radar. Serum Baclofen level may be sent to specialty laboratory if available for confirmation (Dease, et al). An electrocardiogram should be obtained. Computed tomography may be considered to widen the differential for altered mental status. An electroencephalogram should be ordered to monitor for seizures due to concerns for non-convulsive status epilepticus in the setting of Baclofen overdose (Dease, et al).

Management:

Airway, breathing, and circulation come first. Stabilization of the airway in severe Baclofen toxicity is likely necessary due to the profound respiratory depression. If the overdose occurred recently, a nasogastric tube can be placed and activated charcoal can be given. Intravenous fluids should be given to stabilize hypotension, though vasopressors may be required. If the patient seizures, benzodiazepines may be used. The care is overall supportive care until patient regains CNS functionality, with frequent neurologic assessments. It is important to be aware that Baclofen withdrawal can occur and Baclofen should be restarted after the stages of toxicity to prevent withdrawal (Dease, et al). Lastly, if the overdose was intentional, it is important to have Psychiatry on board for suicide attempt and maintain suicide precautions.

Conclusions:

Baclofen overdose can mimic brain death. Although testing, for example EEG, and clinical exams may indicate brain death for several days, it is very important to recognize that in the setting of Baclofen overdose, this can be a false finding. Taking it day by day and giving supportive care with vigilant neurologic exams is imperative in treating these patients.