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CASE REPORT

Charcoal hemoperfusion in bupropion overdose



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KEYWORDS

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Bupropion is a relatively new and popular medication for depression, with seizures as its major side effect. In the literature, there are insufficient data about hemodialysis following bupropion overdose. A 23-year-old female patient was brought to our emergency department with acute change in mental status and seizure after deliberate self-poisoning with approximately 25–30 tablets of bupropion hydrochloride. Her Glasgow coma scale score was 8/15. The patient underwent hemodialysis about 4 hours later. After 4 hours of extracorporeal treatment, she became conscious and was extubated. We present a case of full recovery after charcoal hemoperfusion following a bupropion overdose.

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Introduction

Bupropion is a monocyclic antidepressant and is thought to act mainly as an inhibitor of dopamine and norepinephrine uptake.^{1,2} Symptomatic bupropion overdose is characterized mainly by sinus tachycardia, hypertension, agitation, and generalized seizures.³ Bupropion theoretically would not be extracted efficiently by charcoal hemoperfusion.^{4,5} We describe a case of a patient with altered mental status and status epilepticus after deliberate self-poisoning who recovered fully after hemodialysis.

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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Case report

A 23-year-old female patient with altered mental status was brought to our emergency department due to drug intoxication. We learned that she had taken 25–30 tablets of Wellbutrin XL (contains 300 mg of bupropion hydrochloride). Complaints of seizure, nausea, vomiting, fatigue, and lethargy had started 7 hours after ingestion. She had a history of depressive disorder. The Glasgow coma scale (GCS) score was 8/15 at admission. It was learned that she had experienced a generalized tonic-clonic seizure before her arrival to the emergency department. The vital signs were: blood pressure 110/65 mmHg, pulse rate 125/minute, respiratory rate 22 breaths per minute, and temperature 37°C. After a short time, a tonic-clonic seizure started and continued. The patient was intubated and sedated. After intubation, gastric lavage was performed, and activated charcoal was applied. Arterial blood gas results were:

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pH 7.21, pCO₂ 36.5 mmHg, PO₂ 66 mmHg, HCO₃⁻ 14 mM, and oxygen saturation 88%. On electrocardiography, there was sinus tachycardia. Emergency charcoal hemoperfusion was performed about 4 hours after admission. The patient was conscious 4 hours after the hemoperfusion and 8 hours after admission to the emergency department. Electrocardiography and vital signs were normal after hemoperfusion. During the follow-up, the patient was diagnosed with aspiration pneumonitis. The aspiration pneumonitis was treated with ceftriaxone i.v. and metronidazole i.v. After consultation with the psychiatry department, she was discharged with oral antibiotherapy and a psychiatric drug on Day 7 of hospitalization, with full neurological recovery.

Discussion

Seizures with an overdose of bupropion have occurred with single doses ranging from 575 mg to 23,000 mg.^{1,2} In our case, the total estimated bupropion dose ingested was in the range of 7500–9000 mg, and the patient had a *grand mal* seizure and status epilepticus.

Conduction delays (QRS and QTc prolongation) have been reported with acute bupropion overdose.³ Seizures and other clinical effects may be delayed for up to 18 hours, especially after ingestion of sustained-release preparations.³ Symptoms are reported to continue for up to 48 hours. In the current case, the patient had taken tablets of extended-release bupropion. The poisoning signs appeared 7 hours after of drug intake. Status epilepticus occurred after the follow-up of the patient, and there was sinusoidal tachycardia at admission.

Some researchers speculated that the toxicokinetics of tricyclic antidepressant might differ from usual pharmacokinetics and that they may be substantially altered during

severe intoxication, favoring extracorporeal removal.^{4,5} According to previous studies, a marked elevated drug level above the therapeutic range probably decreases both the volume of distribution and the degree of protein binding by tricyclic antidepressant.^{4,5} Chao et al⁴ showed the efficacy of charcoal hemoperfusion for bupropion overdose in a case with ventricular tachycardia and status epilepticus. Therefore, charcoal hemoperfusion may work in a similar way to manage severe bupropion intoxication with status epilepticus. After charcoal hemoperfusion, our patient was conscious 8 hours after admission to our emergency service.

Charcoal hemoperfusion appears to be a good choice to enhance bupropion elimination in acute poisoning. Extracorporeal treatment plays an important role on clinical outcomes of bupropion overdose.

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