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Focus on bupropion toxicity and abuse

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Bupropion overdose may go undiagnosed when it is unintentional or due to medication abuse.

The BC Drug and Poison Information Centre handled 95 cases of bupropion exposure in 2013. Eighty-one involved adults, with 22 therapeutic errors, 47 cases of suspected suicide, and 9 cases of intentional misuse or abuse. Sixty-four of these cases were referred to hospital and 22 patients were admitted to critical care, and there was one death. There were 11 exposures in older children and adolescents, including 9 suspected suicide attempts. More than half experienced moderate to severe effects, and 2 of these patients were admitted to critical care. There were also 3 unintentional exposures in children 5 years and younger; all were referred to hospital for observation.

Pharmacology

Bupropion has antidepressant effects and reduces nicotine craving by stimulating the release and blocking the reuptake of dopamine and norepinephrine, and antagonizing certain nicotinic receptors.¹ Bupropion is actually a cathinone derivative, a class of chemicals related to amphetamines that includes the recreational substances referred to as “bath salts”.²

Unintentional exposures

The US poison control centres reported 6,000 pediatric bupropion exposures that occurred over a 7-year period. A small percentage of these were associated with effects such as tachycardia, irritability, drowsiness, ataxia, hallucinations, lethargy and tremor with doses of bupropion up to 10 mg/kg.³ Seizures occurred in a single patient in this dose range. However, the occurrence of seizures or coma increased with higher doses and when the ingested dose

was unknown. The authors recommended referral to a healthcare facility if the ingested dose was greater than 10 mg/kg (a single tablet in a small child) or if the dose was unknown.

In a review of almost 500 medication errors involving bupropion reported to US poison control centres, the median dose ingested was just 300 mg (mostly sustained-release).⁴ The most frequent adverse effects were agitation, dizziness, tremor, GI upset, drowsiness, and tachycardia, occurring in 6 to 8% of patients, with seizures in 0.8% and hallucinations in 0.4%. Almost 25% of patients were evaluated at a health care facility. Multiple brand names and indications has caused confusion and resulted in errors.. In one case report a patient was unknowingly taking Wellbutrin, Zyban and generic bupropion for a total of 600 mg bupropion/day, that resulted in confusion, agitation, severe gastroenteritis and seizure.⁵

Bupropion abuse

While bupropion's abuse potential is low for most patients at therapeutic doses, early animal and human experiments hinted at the amphetamine-like properties of bupropion.⁶ On the popular "user experience" website, Erowid.org, reports of recreational use by ingestion and insufflation or snorting began appearing in 2001.⁷ The first report of recreational use of bupropion in the medical literature appeared in 2002 and involved ingestion of 600 mg bupropion.⁸ This was followed soon after by a report of bupropion abuse by nasal insufflation which resulted in a brief "buzz" and a seizure.⁹ There have been subsequent published cases of bupropion abuse by insufflation, with users reporting amphetamine- or cocaine-like highs, and adverse effects ranging from nasal pain to irritability and aggression, to hallucinations and more seizures. Most of these patients had a history of substance abuse.¹⁰⁻¹⁶ Snorting "Welbys", "Wellies", "Dubs" or "Barnies" (due to the purple colour) has led to the removal of bupropion from some US prison formularies.¹⁶⁻¹⁸

User satisfaction following ingestion and insufflation of bupropion on the Erowid website is reported as good, mediocre, and bad. However, intravenous abuse appears to be a growing problem. While injection abuse has been described on the internet as early as 2007,¹⁹ the first report in the medical literature came from Toronto in 2013 and involved a former morphine addict. The patient was injecting bupropion every 2 to 3 hours (total of 1200 mg per day), which produced a euphoric and stimulant-like effect. The patient reported that, "a lot of people are doing this".²⁰ A news report from Toronto highlighted the severe skin lesions and vascular complications caused by injecting bupropion. It was estimated that nearly half of Toronto's injection drug users had tried injecting bupropion.²¹ Ontario's Chief Coroner issued an alert that bupropion abuse via injection or inhalation was a factor in at least 6 deaths in Ontario.²² In one case, inadvertent intra arterial injection of bupropion and cocaine into the vertebral artery resulted in a fatal brainstem infarct.²³

Your role

Pharmacists can help prevent medication errors and unintentional poisonings by counselling patients on proper medication use and encouraging safe medication storage and disposal.

Pharmacists should be aware of the potential for bupropion abuse and can educate patients at risk, as well as other health professionals, on the potential dangers of abuse. DPIC's website has more information on the pharmacist's role in poison prevention and management: <http://dpic.org/content/pharmacists-role-poison-prevention-and-management>.

If you suspect an overdose, call your local poison control centre. In BC, call 604-682-5050 or 1-800-567-8911.

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