

Health-supplement-exacerbated psychosis in Vancouver's Downtown Eastside—not seeing the ephedra for the crystal meth: A case report

When a patient presents with psychiatric disturbances, the physician should ask about the use of supplements, even if the patient appears to have more serious problems with illegal drugs.

ABSTRACT: The case of a woman whose psychotic illness was greatly exacerbated by ephedra demonstrates the need for physicians to screen for use of health supplements, even in patients who appear to have more serious problems with illegal drugs. This case also shows why ephedra and ephedrine should be more tightly managed in Canada. The ephedra plant (ma huang in Chinese) has been used for medicinal purposes for thousands of years. Its active ingredient, ephedrine, is a close relative of amphetamine and methamphetamine. Both ephedra and ephedrine have been used as decongestants in the past, and are available for purchase in health

supplement stores. However, since ephedrine was replaced by more selective beta-agonists for treating asthma in the 1930s, it has been most commonly used as a fitness and weight-loss supplement and not as a decongestant. In 2004 the United States Food and Drug Administration introduced a ban on ephedra-containing supplements and tightly regulated ephedrine after reports of serious adverse events, including severe psychiatric symptoms. In Canada both substances remain readily available—a cause for concern given the significant risk to health they pose, especially in more vulnerable populations.

Case data

A woman in her mid-forties, who gave informed consent for the publication of this case report, initially presented to psychiatric services with psychosis and labile affect. She was diagnosed as suffering from methamphetamine-induced psychosis, possibly with underlying bipolar disorder. She had been functioning relatively well until age 40, when she broke up with a long-term boyfriend, lost her apartment and vehicle, and wound up in shelter-like accommodation in Vancouver's Downtown Eastside, where she began using crystal meth. Even following a few involuntary admissions and depot injection of the antipsychotic risperidone (Risperidal Consta), she frequently expressed anxiety about being persecuted by organized crime and women she believed were "running the city." She also became very irritable,

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sometimes confronting people on the street over “all the pornography and garbage” she perceived to be around the city. While her behavior could have been explained by methamphetamine-induced psychosis, her symptoms did not occur in a temporal pattern that matched her crystal meth use.

The patient was very interested in physical fitness and spent considerable amounts of time lifting weights and going for long walks. She often

cantly more organized, no longer expressed persecutory delusions, was able to voluntarily enter a detox centre, moved from shelter-like accommodation to more permanent housing, and returned to earning some income. Though the cause of the patient's psychosis was likely multifactorial, we believe the ephedra exacerbated her condition, since the severity of her illness abated significantly when she stopped using ephedra.

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complained of a racing heart during physical activity, and was concerned that she was going to have a heart attack. When questioned about her workout routines, she said she had been using ephedra on and off since her twenties to give her increased energy. Contrary to Health Canada guidelines, which allow the use of ephedra as a decongestant for a maximum of 7 days, she had been trying to build physical endurance by using 8 to 16 mg of ephedra daily for several months. During this time she was able to obtain a regular and cheap supply from a nearby health supplement store.

After being informed about the connection between her supplement use and her cardiac symptoms, she was convinced to discontinue the ephedra. Following this, she became signifi-

Discussion

Several species of shrubs are included in the genus *Ephedra*. *E. sinica*, known in Chinese as ma huang, has been used for medicinal purposes in China for over 5000 years.¹ The primary active ingredient, ephedrine, was first isolated by Nagai in 1885 and then by Merck in 1886.¹ It is both an alpha- and beta-adrenergic agonist and also promotes norepinephrine and epinephrine release.² The immediate CNS stimulant effects of ephedrine result from promotion of dopamine release.³ Systemically, ephedrine causes increased peripheral resistance, heart rate, and blood pressure, as well as urinary retention and bronchodilation.⁴

Through the 1920s and 1930s, ephedrine replaced adrenaline for the treatment of asthma because it could

be taken orally, had a more prolonged effect, and had greater chemical stability.¹ Eventually, it was replaced by more selective beta-agonists.

During the 1990s ephedra became widely used for fitness training and weight loss, and recreationally for its stimulant effects. Some forms were marketed to suggest they were versions of illegal substances (e.g., Herbal Ecstasy)⁵ and were likely regarded as being safer because they were “natural,” despite a fivefold to twentyfold variation in the ephedrine content of different supplements advertising equivalent doses.⁶ It is estimated that 12.5 million US adults used ephedra between 1996 and 1998.⁷

Along with adverse events such as arrhythmia and stroke, psychiatric complications were common. The most common psychiatric disturbances, in order, were psychosis, severe depression, mania/severe agitation, hallucinations, sleep disturbance, suicidal ideation, suicide attempt, and ephedra abuse/dependence. The majority of patients were women (60%), and most patients who experienced psychiatric disturbances had taken ephedra for over 2 months (59%).⁸ Although ephedrine-induced psychosis is typically reversible with discontinuation, it can present after prolonged use or after a single dose.³ Comorbid contributors to psychosis (e.g., primary psychotic illness, use of other stimulants) are often present.³

Complaints about ephedra eventually led the US Food and Drug Administration (FDA) to ban its use in 2004. This was prompted in part by the death of a professional baseball pitcher, Steve Bechler of the Baltimore Orioles, that was linked to ephedra use and consolidated negative public opinion about its use.⁵ Despite the ban on ephedra and tight regulation of ephedrine in the United States, both ephedra and ephedrine remain readily avail-

able in Canada. For a little over \$5 we were able to purchase a bottle of 50 8-mg tablets of ephedrine at a number of supplement stores in Vancouver. We had more difficulty finding ephedra powder, but did eventually find this formulation for sale as well.

Summary

As a close relative of amphetamine and methamphetamine, ephedrine is associated with significant risk of psychiatric symptoms. Ephedrine and its botanical source ephedra are readily available in legal, low-cost, "natural" stimulant products in British Columbia, and are known to cause psychosis, typically reversible with discontinuation. This case demonstrates the need to ask patients about health supplements, even patients who appear to have more serious problems with illegal drugs. We believe Health Canada should develop regulations more in line with the American FDA. The popularity of ephedra and ephedrine clearly poses a significant risk to health, especially in some more vulnerable populations.

Competing interests

None declared.

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