LETTER TO THE EDITOR

Banned, but Not Forgotten: A Case of Ephedrine-Induced Psychosis

Sir: In February 2004, the U.S. Food and Drug Administration (FDA) prohibited the sale of dietary supplements containing ephedrine alkaloids. This final ruling, which took effect in April 2004, garnered its regulatory authority under the Dietary Supplement Health and Education Act of 1994 (DSHEA). The DSHEA bypasses usual regulatory practices for agents classified as dietary supplements. It requires instead that supplements demonstrate a “significant or unreasonable risk” prior to any formal action.

Accordingly, ephedrine has repeatedly been implicated in adverse and sometimes fatal outcomes despite compliance with recommended dosages. Ephedrine has been likened to other sympathomimetics and controlled stimulants, and the FDA cited significant cardiovascular risk in support of their final rule to ban its sale. In the wake of this FDA decision, a case of ephedrine-induced psychosis is presented. The case underscores both the likelihood of continued ephedrine consumption and the varied clinical presentations associated with adverse reactions to this supplement.

Case report. Ms. A, a 28-year-old white woman, was escorted to the emergency department by police after being found disheveled, wandering the streets, and exhibiting “bizarre behavior.” Medical evaluation revealed elevated blood pressure (168/99 mm Hg), tachycardia (122 bpm), and mydriatic pupils. Results of her physical examination were otherwise unremarkable. Results of basic serum laboratory work were within normal limits. The patient’s serum alcohol level was undetectable. Urine toxicology was notably positive for caffeine, nicotine, and sympathomimetics. Illicit agents screened for and not detected included phenylcyclidine, cocaine, benzodiazepines, barbiturates, opiates, amphetamines, and marijuana.

Following medical clearance, Ms. A was transferred to the psychiatric emergency department. She reported being in New Orleans, La., on vacation. Four days prior to presentation, a night “out on the town” was reportedly followed by the theft of her car. Ms. A then recalled becoming increasingly concerned about “people [being] after [her].” This led to 3 days of “no sleep” and wandering on foot from one hotel to another attempting to evade her alleged pursuers. When asked about her pursuers, she said that members of an organized crime family had been following her. The patient was without formal or significant medical, surgical, or psychiatric history. Her family history was non-contributory except for reported obesity among multiple family members. Neither Ms. A nor her parents reported symptoms or behaviors suggesting mood disturbances, specifically bipolar disorder, in Ms. A or any family member. She reported consuming a glass of wine with dinner 2 to 3 nights per week, but not to intoxication. She admitted to current tobacco use and remote marijuana use. She otherwise denied illicit substance use.

Initially reporting vitamins in her medication history, upon repeat inquiry the patient revealed a 2-month history of use of an over-the-counter “herbal weight-loss pill.” Results of a mental status examination were notable for a complete absence of psychotic symptoms. Her vital statistics and physical examination criteria (that had resolved with discontinuation of the dietary supplement. Results of her discharge mental status examination were notable for a complete absence of psychotic symptoms. Her vital statistics and physical examination results were reportedly also without notable aberration, though her medical records were unavailable for review.

Used for over 5000 years by Chinese herbalists, ephedrine was introduced into Western medical practice in the 1930s for the treatment of asthma. Ephedrine alkaloid consumption will most likely exponentially in the latter part of the 20th century after discovery of its utility in weight loss and athletic performance. Ephedrine acts via catecholamine release into the synapse, as well as via postsynaptic α1-, β1-, and β2-adrenergic receptor stimulation. These properties have resulted in significant and potentially fatal adverse effects that outweigh purported benefits, which lack rigorous scientific support.

Despite the FDA’s recent ban on ephedrine-containing dietary supplements, American preoccupation with body image suggests that ephedrine consumption will most likely not change. Due to demand for the supplement and unregulated access through Internet distributors, ephedrine-containing supplements will continue to be sought after for weight loss and athletic performance. Clinicians should therefore be prepared to readily identify adverse reactions related to ephedrine use, including psychiatric complications.

Dr. Kim and LeBourgeois report no financial affiliation or other relationship relevant to the subject matter of this letter.

REFERENCES

1. Food and Drug Administration, HHS. Final rule declaring dietary supplements containing ephedrine alkaloids adulterated because...
they present an unreasonable risk. Fed Regist 2004;68:6787–6854
2. US Food and Drug Administration. Dietary Supplement Health and
Education Act of 1994. Dec 1, 1995. Available at:
3. Haller CA, Benowitz NL. Adverse cardiovascular and central nervous
system events associated with dietary supplements containing ephedra
5. Martin WR, Sloan JW, Sapira JD, et al: Physiologic, subjective, and
behavioral effects of amphetamine, methamphetamine, ephedrine,
phenmetrazine, and methylphenidate in man. Clin Pharmacol Ther
1971;12:245–258
6. Daly PA, Krieger DR, Dulloo AG, et al. Ephedrine, caffeine and
aspirin: safety and efficacy for treatment of human obesity.

erties of ephedrine: theoretical implications. Psychopharmacology
(Berl) 1977;55:115–120

Thomas J. Kim, M.D., M.P.H.
Departments of Internal Medicine and Psychiatry
Tulane University Health Sciences Center
New Orleans, Louisiana
H. W. LeBourgeois III, M.D.
Department of Psychiatry
University of Massachusetts Medical School
Worcester, Massachusetts