Psychosis with Vicks Formula 44-D abuse

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Cough and cold remedies often contain central nervous system stimulants such as phenylpropanolamine. This particular stimulant appears to have great potential for being abused[1-4] and for causing psychosis.[4-7] We describe a patient in whom a paranoid psychosis developed after abuse of Vicks Formula 44-D (Proctor & Gamble Inc., Toronto) to alert our colleagues to the possibility that some over-the-counter cough and cold preparations may be abused and cause psychosis.

Case report

For 18 months a 25-year-old woman had consumed daily 800 mL of Vicks Formula 44-D (containing 12.5 mg of phenylpropanolamine, 15 mg of dextromethorphan and 100 mg of guaifenesin per 5 mL), the maximum recommended dosage being 10 mL four times daily. On presentation she was dishevelled and frightened, her speech was tangential and her affect labile, and she was deluded that she knew the whereabouts of a US hostage held in Lebanon and must rescue him. She was correctly oriented but had grossly impaired attention and concentration that precluded further cognitive testing.

The patient had warm, moist extremities, generalized, symmetric 4+ hyperreflexia with flexor plantar reflexes, and vertical and horizontal nystagmus. Her heart rate was 140 beats/min and blood pressure 148/102 mm Hg. The remainder of the physical examination yielded normal findings.

The serum thyroxine level was 126 (normally 50 to 125) nmol/L, the serum triiodothyronine resin uptake 0.33 (normally 0.35 to 0.45) and the free thyroxine index 0.415 (normally 0.245 to 0.666). Thyroid stimulating hormone levels were not measured. An electrocardiogram was unremarkable apart from evidence of sinus tachycardia. Catecholamine levels were not measured. Other routine laboratory findings were normal.

The patient's condition was managed without medications, and she recovered uneventfully. The physical findings returned to normal within 2 days, at which time her pulse rate was 80 beats/min and her blood pressure 110/80 mm Hg. Her psychosis remitted within 3 days without the development of a withdrawal syndrome.

After her recovery the patient described a long history of over-the-counter drug abuse but not of alcohol abuse or of taking "street drugs." At the age of 13 years she had begun taking Gravergol (Frank W. Horner Inc., Ville Mont-Royal, Que.) to lose weight (each tablet containing 1 mg of ergotamine tartrate, 100 mg of caffeine and 50 mg of dimenhydrinate) and continued "because I was addicted to it." At about the age of 14 years she had switched to 300 mg of dimenhydrinate daily. She had stopped taking dimenhydrinate during her two pregnancies but had taken it again between them. After her second delivery she had changed from dimenhydrinate to Triaminic-DM expectorant (Ancalab, Whitby, Ont.), which contains 12.5 mg of phenylpropanolamine hydrochloride, 15 mg of dextromethorphan hydrobromide, 6.25 mg of pheniramine maleate, 6.25 mg of pyrilamine maleate and 100 mg of guaifenesin per 5 mL; she had increased her intake to 345 mL daily, the maximum recommended dose being 10 mL four times daily. She later changed to Vicks Formula 44-D.

Vicks Formula 44-D made her "high, hyper. . . . [I] could go the whole day without sitting down . . . [but] would frequently lose up to 2 hours at a time." She gradually became convinced that

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people were staring in through the windows and regularly locked herself in a closet when alone. She spent at least $15 000 in 1 year on Vicks Formula 44-D and later shoplifted it. She often vomited after taking the drug but would save the vomitus and swallow it later. She neglected her housework and children, and her marriage deteriorated. She attributed all these problems to substance abuse.

After detoxification she received psychotherapy, was educated about the perils of substance abuse and was encouraged to attend Alcoholics Anonymous meetings, since there was no local chapter of Narcotics Anonymous. Unfortunately, she resumed taking Vicks Formula 44-D shortly after discharge and was admitted to another centre 6 months later with a paranoid psychosis.

Comments

This patient appeared to have a propensity to abuse unconventional substances. The dimenhydrinate or caffeine content was probably what caused her to take Gravergol, since both substances have the potential for abuse.[8-11] (Ergotamine also has this potential, but the abuse usually occurs in the context of recurrent headaches.[12]) The patient's switch from dimenhydrinate to Triaminic-DM expectorant likely reflected a preference for phenylpropanolamine over dimenhydrinate, although pheniramine may also be abused[13] and may have initially played a part. Dextromethorphan, a derivative of the opiate analgesics, is generally felt to be devoid of analgesic or addictive properties[14] although its abuse has been reported.[15,16] Our patient's subjective experiences and paranoid psychosis and the physical findings are most likely due to abuse of phenylpropanolamine. A search of MEDLINE over 25 years failed to yield any reports of guaifenesin abuse.

The clinical picture described was unlikely to be a result of anything other than drug abuse, given the known effects of phenylpropanolamine,[17] the rapid and complete resolution of the patient's psychosis and the return to normal of the physical findings after the consumption of Vicks Formula 44-D was stopped.

Phenylpropanolamine differs from amphetamine by the substitution of a hydroxyl group at the β position of the ethylamine side chain.[1] This substitution results in less central stimulant activity and greater peripheral α and β agonistic effects.[17] Despite the lesser central activity the characterization of phenylpropanolamine as an over-the-counter amphetamine[3] and its depiction as "pseudo-speed"[2] have promoted its abuse potential, a potential that is probably due to the capacity of amphetamine-like drugs to release newly synthesized dopamine from intraneuronal stores.[18] The serious side effects of phenylpropanolamine abuse include acute hypertension,[4,6] seizures,[7] visual and auditory hallucinations,[5,6] a paranoid psychosis similar to that induced by chronic amphetamine abuse[6] and delirium.[4] The psychic disturbances may result from the release of dopamine from intraneuronal stores,[18] although hypertensive encephalopathy may also play a role, particularly in delirium.[4]

Phenylpropanolamine is contained in numerous over-the-counter cough and cold remedies, nasal decongestants and dietary aids;[4,6] thus, many of these preparations are candidates for abuse. Physicians should be aware of the possibility of such abuse, particularly when assessing patients who present with an unexplained acute psychosis and hypertension.

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