**CASE REPORT**

**Rhabdomyolysis After Ingestion of “Foxy,” a Hallucinogenic Tryptamine Derivative**

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“Foxy methoxy” (chemical name, 5-methoxy-N,N-diisopropyl-tryptamine) is a hallucinogenic tryptamine that has been abused with increasing frequency since its appearance in the late 1990s. Like other drugs in this class, foxy frequently produces feelings of euphoria, disinhibition, and auditory as well as visual hallucinations. The drug has been linked to adverse effects, including restlessness, agitation, gastrointestinal distress, and muscle tension. In light of the relatively recent advent of foxy as a drug of abuse and given the inability of commercial toxicologic screening tests to detect the presence of hallucinogenic tryptamines, additional adverse effects seem probable. We report ingestion of foxy by a healthy 23-year-old man that resulted in rhabdomyolysis and transient acute renal failure.


A hallucinogenic drug analogue of N,N-dimethyltryptamine (DMT), “foxy,” or “foxy methoxy” (5-methoxy-N,N-diisopropyltryptamine [5-MeO-DIPT]) has a potency 7 times greater than that of DMT.1 5-MeO-DIPT has been widely available over the Internet and is popular at clubs and “raves” because of its stimulant-hallucinogenic properties. The drug has recently been placed in Schedule I of the Controlled Substances Act.2 It is available as a pill for oral ingestion and as a powder for “snorting” or smoking. We summarize what we believe is the first report of rhabdomyolysis associated with the ingestion of 5-MeO-DIPT.

**REPORT OF A CASE**

A healthy 23-year-old man was brought to the emergency department because of combative behavior and hallucinations. He had reportedly ingested 25 mg of 5-MeO-DIPT 30 minutes before symptom onset, which is somewhat more than the typical oral ingestion of 6 to 20 mg.2 He later noted that a friend had ingested some of the same supply of the drug without unpleasant effects. The patient denied concurrent use of other substances and had no history of the drug without unpleasant effects. The patient denied

hypertension (blood pressure, 171/70 mm Hg), tachycardia (heart rate, 150/min), and tachypnea (respirations, 24/min). His oral temperature was 38.7°C. Physical examination findings were unremarkable except for agitation. The patient’s urine was dark red.

Initial laboratory studies (reference ranges shown parenthetically) were notable for nonoliguric acute renal failure with a serum creatinine level of 1.7 mg/dL (0.9-1.4 mg/dL); elevated anion gap metabolic acidosis (anion gap, 44 mmol/L [10-20 mmol/L]); and a serum bicarbonate level of 9 mmol/L (22-30 mmol/L). Urinalysis was positive for heme pigment, and microscopic examination of the urine revealed numerous pigmented granular casts. The peak creatine kinase level was 38,855 U/L (30-220 U/L), with a peak myoglobin level of 13,415 mg/L (0-110 mg/L). Urine toxicoology screening was negative for amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, ethanol, or phencyclidine. Rhabdomyolysis associated with 5-MeO-DIPT ingestion was diagnosed. Aggressive hydration and alkaline diuresis were initiated, with improvement in renal function and resolution of the metabolic acidosis. At hospital dismissal, the serum creatinine and creatine kinase levels were 0.9 mg/dL and 233 U/L, respectively.

**DISCUSSION**

Hallucinogenic tryptamines, including 5-MeO-DIPT, are derivatives of indolethylamine (tryptamine) with substitutions on the indole ring and ethylamine side chains responsible for hallucinogenic properties. Other drugs in the class, all associated with abuse, include alpha-ethyltryptamine, alpha-methyltryptamine, DMT, and psilocybin.

5-MeO-DIPT emerged as a drug of abuse in 1999 and has been used increasingly since then. Desired effects of foxy include euphoria, visual and auditory hallucinations, loss of inhibition, and feelings of empathy for and “connectedness” to others. Adverse effects, which appear in part to be dose-related, include insomnia, restlessness, mydriasis, nausea and vomiting, diarrhea, muscle tension, and uncontrolled jaw clenching. Effects generally occur within 20 to 30 minutes of ingestion and persist for 3 to 6 hours.2,5 The effects of foxy mimic those of 3,4-methylenedioxymethamphetamine (MDMA, “ecstasy”), as well as those of the aforementioned hallucinogenic tryptamines that have been previously or concurrently placed in Sched-
Rhabdomyolysis after ingestion of “foxy,” a hallucinogenic tryptamine derivative

THE RELATIONSHIP BETWEEN THE DIAGNOSIS OF FOXY INTOXICATION AND PREVENTION OF SEROTONIN SYNDROME

A 15-month review of the American Association of Poison Control Centers’ Total Exposure Surveillance System database during 2002 and 2003 revealed 41 reported exposures to 5-MeO-DIPT, 28 of which were deemed to be “moderate” or “major.” Effects included agitation in 59%, hallucinations in 39%, tachycardia in 37%, and hypertension in 17%. Although often considered “safe” drugs by the teens and young adults who favor their use, recent reports of fatalities associated with the ingestion of foxy and other hallucinogenic tryptamines suggest otherwise. Tanaka et al reported autopsy evidence of myocardial ischemia and pulmonary hemorrhage in a 29-year-old patient who died after foxy exposure.

The diagnosis of foxy intoxication is challenging because commercially available toxicology screening tests are unable to detect hallucinogenic tryptamines, although gas chromatography/mass spectrometry–based assays have shown a high degree of sensitivity for the detection of 5-MeO-DIPT. Other methods, including high-performance liquid chromatography and nuclear magnetic resonance, also appear to reliably distinguish the various hallucinogenic tryptamines.

Rhabdomyolysis is a known complication of multiple drugs of abuse. A recent review of 475 cases of rhabdomyolysis treated at an academic medical center revealed an association with alcohol or illicit drug intoxication in 34%. Alcohol has the strongest link to rhabdomyolysis of any drug of abuse, and although this association is frequently multifactorial, an element of direct myotoxicity appears to exist. Cocaine, amphetamines, and phenylcyclidine have been shown to cause rhabdomyolysis through postulated mechanisms that include muscle ischemia, muscle hyperactivity, and direct myotoxicity. Both acute and delayed rhabdomyolysis have been associated with MDMA, although this association is frequently multifactorial, an element of direct myotoxicity appears to exist. Cocaine, amphetamines, and phenylcyclidine have been shown to cause rhabdomyolysis through postulated mechanisms that include muscle ischemia, muscle hyperactivity, and direct myotoxicity. Both acute and delayed rhabdomyolysis have been associated with MDMA, although this association is frequently multifactorial, an element of direct myotoxicity appears to exist.

The apparent absence of seizures or sustained physiological activity. His presentation included features of the serotonin syndrome, which has been anecdotally associated with foxy ingestion and in which 5-HT2A receptor agonism appears to play a central role. However, the absence of deep tendon reflex examination or assessment for clonus prevents us from confirming or refuting the presence of serotonin syndrome in this patient. A direct myotoxic effect of 5-MeO-DIPT is also possible but cannot be confirmed at this time.

CONCLUSION

5-MeO-DIPT, which along with other hallucinogenic tryptamines is an increasingly common drug of abuse, is not detected by routine toxicology screening. The possibility of intoxication with these agents should be entertained in the appropriate setting, and clinicians should be aware of the potentially serious morbidity and mortality associated with their use.

REFERENCES
