

The Syndrome of Excited Delirium Following Use of "Bath Salts"

To the Editor: In their case report "Bath Salts–Induced Psychosis and Serotonin Toxicity," Joksovic et al¹ provide a detailed description of a case of intoxication delirium associated with use of synthetic cathinones, or "bath salts," a popular substitute for stimulant drugs. The illustrated toxidrome has been described in a subset of recreational users of these substances, presenting as both a medical and a psychiatric emergency.²

While the primary substance reported with cases of cathinone-related reactions in the European literature has been mephedrone (4-methylmethcathinone), all cases reported in the United States in which laboratory confirmation has been obtained have identified the cathinone derivative involved as methylenedioxypropylvalerone (MDPV).³ In the case report by Joksovic et al,¹ and in a commentary by Rasimas,⁴ this constellation of symptoms is attributed to a "serotonin syndrome." Support cited for this attribution is a single animal study reporting blockade of the serotonin reuptake enzyme (SERT) involving mephedrone.

The "bath salts–induced psychosis" described in several case reports^{2,3} is consistent with the description of patients with "excited delirium," a condition associated with other stimulants such as cocaine and methamphetamine, which has been associated with a significant mortality rate.⁵

The reference to "serotonin syndrome" in both articles is unfortunate and not well supported. MDPV has been shown in multiple studies to have powerful actions as an inhibitor of the dopamine transporter enzyme with only a weak effect on central serotonin.^{6–8} While the patient reported by Joksovic and colleagues responded well to supportive care, many such patients present to the acute setting with extreme agitation and violent or self-destructive behavior that results in the use of physical, chemical, or electronic restraint prior to or during the early part of a hospital stay. The patient described by Joksovic et al demonstrated evidence of temperature dysregulation, also described as part of the syndrome of excited delirium.^{9,10} The distinction between serotonin syndrome and excited delirium has consequences for treatment of these challenging patients. Rasimas' recommendation⁴ that antipsychotics be used should be evaluated with some caution. While time-limited administration of very low-dose antipsychotic agents might have some usefulness in resolving the psychotic symptoms of delirium, use of drugs that inhibit central dopamine, such as haloperidol, should be discouraged in this context, as they have the potential to exacerbate the hyperthermia and rhabdomyolysis that frequently complicate the management of these patients.

While the syndrome of excited delirium has now found acceptance within Emergency Medicine, its pathophysiology remains incompletely understood.⁹ It appears, however, that the cases described over the past 30 years involve dysregulation of dopamine and norepinephrine and do not result in a classical serotonin syndrome.¹⁰

REFERENCES

1. Joksovic P, Mellos N, van Watum PJ, et al. "Bath salts"–induced psychosis and serotonin toxicity. *J Clin Psychiatry*. 2012;73(8):1125.
2. Penders T, Gestring RE, Vilensky DA. Excited delirium following use of synthetic cathinones (bath salts). *Gen Hosp Psychiatry*. 2012;34(6):647–650.
3. Penders TM, Gestring RE, Vilensky DA. Intoxication delirium following use of synthetic cathinone derivatives. *Am J Drug Alcohol Abuse*. 2012;38(6):616–617.
4. Rasimas JJ. "Bath salts" and the return of serotonin syndrome. *J Clin Psychiatry*. 2012;73(8):1126–1127.
5. Wetli CV, Fishbain DA. Cocaine-induced psychosis and sudden death in recreational cocaine users. *J Forensic Sci*. 1985;30(3):873–880.
6. Martínez-Clemente J, Escubedo E, Pubill D, et al. Interaction of mephedrone with dopamine and serotonin targets in rats. *Eur Neuropsychopharmacol*. 2012;22(3):231–236.

7. Kelly JP. Cathinone derivatives: a review of their chemistry, pharmacology and toxicology. *Drug Test Anal*. 2011;3(7-8):439–453.
8. Baumann MH, Partilla JS, Lehner KR, et al. Powerful cocaine-like actions of 3,4-methylenedioxypropylvalerone (MDPV), a principal constituent of psychoactive "bath salts" products [published online ahead of print October 17, 2012]. *Neuropsychopharmacology*.
9. Vilke GM, DeBard ML, Chan TC, et al. Excited Delirium Syndrome (ExDS): defining based on a review of the literature. *J Emerg Med*. 2012;43(5):897–905.
10. Takeuchi A, Ahern TL, Henderson SO. Excited delirium. *West J Emerg Med*. 2011;12(1):77–83.

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