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Case Report Open Access

Bath Salt Thrombosis

Irene Dy* **and Stephanie Lankford**

Department of Hematology and Oncology, St. Luke's Roosevelt Hospital Center, New York, New York, USA

***Correspondence author:** Irene Dy, Department of Hematology and Oncology, St. Luke's Roosevelt Hospital Center, New York, New York, USA, Tel: 212-523-4000; E-mail: irenedymd@yahoo.com

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Abstract

This report describes the treatment of a thirty-one year old chronic drug abuser who claimed to use intravenous morphine daily along with a wide array of other illegal drugs and bath salts. The unkempt patient was diagnosed with hypertension and extensive occlusive thrombosis throughout bilateral cephalic veins extending from the neck to below the elbow.

Keywords: Bath salts; Thrombosis; Antecubital fossa injections; Cathinone

Case Report

Thirty-one year old chronic drug abuser presented to our local hospital. He claimed to use intravenous morphine daily along with a wide array of other illegal drugs such as hydromorphone, fentanyl and oxymorphone. He was diagnosed with hypertension but admitted to being non-adherent to his medication. He complained of bilateral upper arm swelling and pain which started a day after injecting bath salts on both antecubital fossae. He stated that he used bath salts in this route before without such complications. He denied any fever, chills, chest pain, shortness of breath, abdominal pain, nausea or vomiting. Physical examination revealed an unkempt man who was not in acute respiratory distress. His bilateral upper extremities were swollen, tender and erythematous. Neurologic exam was non-focal. Venous Doppler ultrasound of the upper extremities revealed extensive occlusive thromboses throughout bilateral cephalic veins extending from the neck to below the elbow. CT scan of the chest did not reveal any pulmonary embolus. He was started on anticoagulation and antibiotics for cellulitis. He was discharged a few days later after symptoms abated. He has not followed-up for his clinic appointments and INR monitoring.

Discussion

Locally named 'bath salts', these synthetic cathinone derivatives first emerged in 2007, as a substitute for cocaine and ecstasy. They are available in white or tan-colored crystalline powders and they can be swallowed, insufflated or injected [1-3]. 'Bath salts' are appealing for recreational use because they are more easily obtained than amphetamines but produce similar highs. Purchasers can typically find synthetic cathinones in head shops or via the internet; these drugs are often labeled as 'bath salts' or 'plant food' along with 'not for human consumption' to evade legislation [4]. The usual cost for 300mg is $20 [5]. Other street names of bath salts are red dove, vanilla sky, ivory wave, bliss, white lightning, super coke, tranquility, zoom, and magic [6,7].

Cathinone, S(-)-alpha-aminopropiophenone, is a naturally extracted alkaloid from *Catha edulis,* or khat plant, traditionally chewed in Arab Peninsula and East Africa. Residents of these regions often chew khat leaves for stimulating effects similar to those of amphetamine [7-10]. This similarity is because cathinone is an analogue of amphetamine; alteration of its chemical structure results in the formation of mephedrone, methylone and flephedrone. Their stimulant effects include tachycardia, palpitations, agitation, delusions, extreme paranoia, chest pain, dyspnea, nausea, vomiting, headache, hypertension, hallucinations and peripheral vasoconstriction [5].

Coingestion of other recreational drugs, such as amphetamines or cocaine, is common [1]. In the US, there was a dramatic increase in 'bath salt' related calls to poison control centers from 303 in 2010 to 4,720 by 2011 [9].

'Bath salts' are composed primarily of 3,4-methylenedioxypyrovalerone (MDPV) and 4-methylmethcathinone (mephedrone) [4]. MDPV is a dopamine and norephinephrone reuptake inhibitor which is a powerful stimulant. Mephedrone, on the other hand is hypothesized to work as a monoamine reuptake inhibitor, increasing serotonin, norepinephrine and dopamine levels at synapses [9]. 'Bath salts' are not always consistent in chemical make-up, so users could easily use combinations of several drugs or unidentified chemicals unknowingly, occasionally resulting in undesirable adverse effects. Patients admitted to hospitals after 'bath salt' use often admit to increasing a typical dose due to a lesser response to the drug after continuous use [11]. This could be due to the fact that cathinones have a high permeability in an *in vitro* model through the blood-brain barrier [12,13] which results in an effective high and a greater addictive dependence on the drug.

Local complications such as cellulitis, thrombophlebitis, and abscess formation have been reported due to its widespread use. Poor hygiene, unsterile needles, and immune deficiency states are multiple factors leading to these complications. These agents can extravasate and cause chemical cellulitis with necrosis [5]. Similarly, in our index patient, direct trauma and infection contributed to venous thromboembolism development.

One incident reported at a suburb of Illinois of a 48 year old man who died from coronary artery thrombosis after detecting toxic levels of alpha PVP, an active ingredient in bath salts [6]. A study by James et al reported of one patient with mephedrone toxicity who complained

of chest pain and was found to have EKG changes of acute myocardial infarction [8].

Other systemic and fatal complications reported were endocarditis, disseminated intravascular coagulation and septic pulmonary embolus [2].

Treatment is supportive, ranging from antibiotics for local infections to surgical debridement for abscess or necrotizing fasciitis. Extensive thrombosis, as seen in our patient, required anticoagulation. Benzodiazepines can be used for agitation and seizures.

Public awareness cannot be overemphasized, especially in the healthcare setting. These cathinone derivatives were made illegal in Europe in December 2010 and in Australia and New Zealand by January 2011 [5]. In US, it was temporarily banned in 2011 [9] while awaiting further legal actions. Since these drugs are relatively new, routine urine drug screens may not be able to detect these substances. A call for government restriction of these new synthetic legal intoxicating drugs is needed.

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