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N,*N*-Dimethyltryptamine: DMT-induced psychosis

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1. Introduction

N,*N*-Dimethyltryptamine (DMT) is a novel hallucinogen that acts on brain serotonin receptors and produces a brief yet intense dream-like state with reported psycho-spiritual effects [1]. DMT is growing in popularity as a recreational substance but limited knowledge exists of its adverse effects [2]. We report the cases of two young male patients with no prior psychiatric history who presented to an urban academic emergency department (ED) with psychotic symptoms after consumption of DMT.

2. Case 1

A 25-year-old male was brought by police early in the morning to the ED due to acute psychosis. He was detained by police after breaking in and destroying property at a local nightclub where he is thought to have been employed. Police found him drinking liquor in his underwear in the club prior to his arrest. When he initially presented to the ED, his speech was tangential, rambling and pressured, with delusions of being a fictional character from a movie. He was combative with police and paramedics, and would not tolerate oral medications in the ED. He was sedated with intramuscular (IM) ketamine initially, and was detained under the [XXXXXXX] Mental Health Act. Blood tests showed no significant abnormalities aside from an elevated White Blood Cell count (13.6×10^9/L; 10.5×10^9/L monocytes).

Upon assessment by the psychiatrist, the patient denied paranoia, suicidal or homicidal ideation, and denied visual and auditory hallucinations although he did report visual hallucinations while consuming DMT. His insight and judgement seemed impaired and he had grandiose delusions. His family indicated that he had been isolating himself for the past 5 months. His only family history for psychiatric disorders was a female first cousin with bipolar disorder. He reported regular use of alcohol and cannabis. He had consumed Lysergic Acid Diethylamide (LSD) remotely (6 months prior), but had no psychiatric history until smoking DMT. His psychosis slowly resolved, and he was discharged after 20 days with IM depo paliperidone. He was mandated to follow-up with the Early Psychosis Intervention team.

3. Case 2

A 22-year old male was brought to the ED after police were called to a house party. The patient had apparently consumed DMT and caused substantial property damage due to agitation. He was found by police and paramedics thrashing on the ground, screaming incoherently. He required multiple police officers to restrain him. In the prehospital setting, he received 400 mg of IM ketamine for behavior control, and was transported to the ED. His initial vital signs in the ED were BP 155/95 mmHg, HR 104, RR 14, 94% on 6 L, and 38.1 °C. He was noted to have coarse air entry bilaterally on auscultation, with multiple superficial abrasions on his head. Thirty minutes after arrival, his oxygen saturation was 83% with nasal prongs and trumpet, and the decision was made to intubate him for airway protection and anticipated clinical course. He was intubated on the second attempt, without complication. CT imaging of the brain, and chest X-ray were unremarkable. He was extubated after 4.5 h, was following verbal commands appropriately, and did not require further sedation or antipsychotic administration. He confirmed that he had been using DMT the previous evening. He was discharged home with thorough education and counselling.

4. Discussion

While the rates of DMT use are low compared to other hallucinogens such as LSD and psilocybin, recreational use of DMT is quickly growing. The lifetime prevalence amongst users of hallucinogens is estimated at

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9% (LSD 39%; psilocybin 43%), yet data suggests that DMT has the largest proportion of new users and an overall increasing interest in the substance [2]. The main presentations include hallucinations, tachycardia and agitation, with the median age of users being 21 [3].

DMT acts primarily on the 5-HT_{2A} serotonin receptor, and is commonly derived from a traditional Amazonian herbal product, ayahuasca. Ayahuasca is made from the *Banisteriopsis caapi* vine (beta-carboline harmala alkaloids), and leaves of the *Psychotria viridis* bush (DMT) [1]. Used for over 3000 years by indigenous shamans for spiritual communication, magical experiences, healing and religious rituals across several South American countries, its use as a recreational hallucinogen in North America has grown recently [2,3].

DMT is most commonly consumed by smoking, a route of administration that is not possible with other hallucinogens [2]. Smoking of DMT allows for the bypass of an extensive first pass metabolism by the gut monoamine oxidase (MAO) system and likely contributes to the strong and rapid effect of the substance. With smoking DMT, the mean peak effect is experienced at 6 min with 24 min duration [2]. DMT is sometimes consumed orally with a MAO inhibitor [1], and this may introduce the risk of serotonin syndrome. When consumed without significant adverse effects, users report feeling euphoric and having colourful visual hallucinations [4]. DMT has also been known to facilitate periods of introspection and altered cognition which many users find pleasurable [2].

The adverse effects of DMT are not well studied and there is limited knowledge of its capacity to induce psychosis. A recent systematic review identified only three case reports that described psychotic reactions associated with DMT consumption in recreational contexts [5]. In all three reports there was a history of additional substance use, especially cannabis, and all cases had a family history or personal history with psychosis.

5. Conclusion

DMT is a novel hallucinogen that has the capacity to induce acute psychosis in an individual with no prior psychiatric history. As the interest and popularity of DMT increases, it is highly probable that emergency physicians will see more cases of DMT-induced acute psychosis. Knowledge of this presentation will be important for appropriate treatment and management.

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