

Buzz Juice: Neurological sequelae of synthetic cannabinoids



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ABSTRACT

The use of synthetic cannabinoids is becoming more widespread. Familiarity with the potential toxicities associated with these agents will grow in importance. We present a case of a woman who developed onset of confusion, visual hallucinations, and ataxia after vaporizing synthetic cannabinoids. MRI imaging demonstrated restricted diffusion and increased T2/FLAIR signal in the corpus callosum and cerebellar peduncles.

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1. Case report

A 31-year-old previously healthy woman who repeatedly inhaled vaporized synthetic marijuana (called “Buzz Juice” herbal incense) over two days developed altered mental status and multi-organ failure including hypotension, renal failure, hemolytic anemia, and fevers. Neurologic exam was significant for confusion, visual hallucinations, dysarthria, truncal, appendicular and gait ataxia, and hyperreflexia. EEG showed no seizures. CSF was unremarkable. MRI brain revealed restricted diffusion and T2/FLAIR hyperintensities in the corpus callosum and cerebellar peduncles most consistent with toxic leukoencephalopathy (Fig. 1). Labeling on Buzz Juice revealed that it contained JWH-081.

2. Discussion

JWH-081 is a more potent CB1-receptor agonist than Δ^9 -THC (natural cannabis), which has been shown to cause cognitive impairment in mice [1,2]. Agonists of the CB1 receptor cause a depolarization-induced suppression of inhibition, resulting in reduction of GABA release. In addition to neurotoxicity, human studies show that synthetic cannabinoids can also cause cardiovascular instability, acute renal failure, and respiratory depression [3].

Similar radiographic findings of leukoencephalopathy as seen in this case have been reported in association with abuse of other recreational drugs including heroin and toluene [4,5], possibly due to oxidative myelin damage. The patient's husband also inhaled the drug but to a much lesser extent, but did not develop symptoms of neurotoxicity or organ failure. The difference in outcome between the index case and her spouse could be representative of the variable propensity for symptom development between individuals exposed to the same toxin or it could represent a dose/toxicity relationship as the index case was exposed to a substantially greater amount of toxin over a more prolonged interval. Further collection and analysis of data for Buzz Juice and other synthetic cannabinoids are warranted for correlating clinical and MRI findings of toxic leukoencephalopathy, which may be a dose dependent phenomenon.

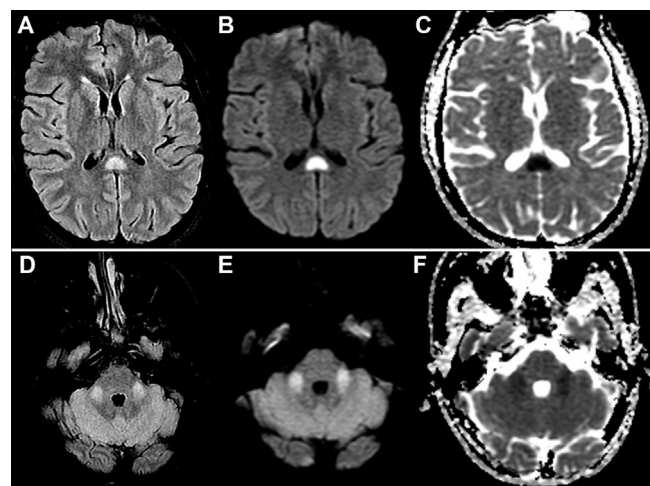


Fig. 1. Noncontrast MRI brain, demonstrating T2/FLAIR hyperintensity (A) and increased diffusion restriction on DWI (B) and ADC-map (C) in the splenium of the corpus callosum, with similar findings in both middle cerebellar peduncles (D–F).

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