

Abstract:

Pediatric marijuana poisonings are increasing in the United States. Signs and symptoms of marijuana exposure in pediatric patients differ throughout the pediatric age spectrum, and it is important for clinicians to be familiar with the profound lethargy or altered mental status that can occur in pediatrics, particularly in toddlers. This article reviews the clinical effects and treatment of pediatric marijuana exposure, as well as issues around legalization and prevention.

Keywords:

pediatric poisoning; marijuana; THC; lethargy; altered mental status; marijuana decriminalization/legalization

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A Review of Pediatric Marijuana Exposure in the Setting of Increasing Legalization

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A 6-year-old boy with a history of febrile seizures presented to an emergency department (ED) with lethargy. The patient had been in his usual state of health until awakening with somnolence and abdominal pain. Mother noted that the patient had brief episodes of body twitching while asleep overnight. There was no history of trauma or fever.

In the ED, the patient's vital signs were normal. He was sleepy, but arousable to stimulation and was confused. His head was normocephalic and atraumatic without bruising or step-offs. Pupils were equal, round, and sluggishly reactive to light. His abdomen was soft, nontender, and nondistended. Initial laboratory testing revealed normal glucose, serum electrolytes, liver function tests, acetaminophen, and salicylate levels. Neurology was consulted. Several diagnostic tests including abdominal ultrasound and head

computed tomography (CT) were performed and were normal. A urine drug screen returned positive for delta-9-tetrahydrocannabinol (THC), the active ingredient in marijuana. The patient's mother subsequently reported that there were various THC containing products in the home, including marijuana-containing brownies and crackers.

The patient was observed in the ED for seven hours with gradual return to his mental status baseline. Social work was consulted and a child protective services referral was placed. The patient was discharged to home with a diagnosis of altered mental status due to marijuana intoxication.

BACKGROUND

Marijuana is the most commonly used drug in the United States^{1,2} and is primarily consumed by smoking or ingestion of edible products. Marijuana use is rising; according to the National Survey on Drug Use and Health, the prevalence of marijuana use in children aged 12–17 years old increased from 6.7% in 2006 to 7.1% in 2013.^{1,2} In addition, there may be a perceived decrease in the stigma associated with marijuana use, as the percentage of those who perceived “great risk” from smoking marijuana once monthly decreased from 35% in 2006 to 24% in 2013.^{1,2}

In the United States, marijuana is considered an illegal Schedule I drug on a federal level under the Controlled Substances Act.^{1,3} However, since 1996, approximately 40 states have legalized medical or recreational marijuana or allowed the use of products containing CBD (cannabinoid).¹ Legislation regulating marijuana products varies greatly from state to state. A 2013 retrospective cohort study done in Colorado found an increase in unintentional marijuana ingestion after modification of drug enforcement laws⁴ and a 2016 retrospective cohort study demonstrated that pediatric marijuana exposures in Colorado increased significantly after legalization of recreational marijuana.⁵ Another study showed that states with decriminalization of medical marijuana had a 30% increase in marijuana-related calls to the poison control center per year compared to states where medical marijuana remained illegal.⁶ Subjects who lived in decriminalized states in this study were more likely to have more serious effects from marijuana and require admission to the intensive care unit.⁶ More recently, the Washington State poison control center has reported an increase in marijuana-related calls following decriminalization of recreational marijuana.⁷

Over the past several years, the potency of marijuana containing products has increased substantially,⁸ and edible marijuana products are more readily available. Ingested THC can produce the same clinical effects as inhaled THC at a lower concentration.⁹ While ingested THC typically reaches peak effect at about 2–3 hours after ingestion, effects can last 5 hours or longer because of continued gut absorption.⁶ In addition, labeled THC concentration may not always correlate to actual THC concentration,¹⁰ depending on the type of product and state laws surrounding labeling. In states where marijuana has been legalized, it is important for medical professionals to familiarize themselves with state regulations around legalized products, including permissible amounts of THC in products.

CLINICAL EFFECTS OF THC

THC, the active ingredient in marijuana, can cause tachycardia, impaired memory, ataxia, dilated and sluggish pupils, euphoria, disorientation, stupor or coma, dizziness, nausea, vomiting, increased appetite or thirst, and injected conjunctiva.¹¹

TODDLER EXPOSURE

Children are more likely than adults to present with neurologic symptoms such as altered mental status, ataxia, or hypotonia.¹² Young children may present with profound central nervous system depression, which may lead to respiratory insufficiency, airway compromise, and aspiration risk.¹⁰ These symptoms often result in extensive workup and delay to diagnosis in a lethargic child presenting with marijuana intoxication.^{4,5}

Historically, there have been few reported cases in children with significant clinical effects from marijuana.⁴ However, with the increase in variety of edible marijuana products that may be more desirable to children, there has been an increase in toddler poisonings.⁴⁻⁶ Further, marijuana edibles can contain very high concentrations of THC leading to symptom development with as little as one serving size.¹³

In toxicology, increased accessibility consistently leads to increased accidental exposure,¹⁴ and marijuana is no exception. Several studies have already demonstrated an increase in unintentional marijuana exposure with changes in legislation.⁴⁻⁶ While unintentional marijuana ingestion remains relatively uncommon in the overall scheme of childhood ingestions,¹³ as more states vote to

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