



Inadvertent Ingestion of Marijuana— Los Angeles, California, 2009

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ON APRIL 8, 2009, THE LOS ANGELES POLICE DEPARTMENT (LAPD) notified officials from the Los Angeles County Department of Public Health (DPH) in California about a group of preschool teachers with nausea, dizziness, headache, and numbness and tingling of fingertips after consumption of brownies purchased 3 days before from a sidewalk vendor. To characterize the neurologic symptoms and determine whether these symptoms were associated with ingestion of the brownies, the police and health departments launched a collaborative investigation. This report summarizes the results of that investigation, which detected cannabinoids in a recovered sample of the brownies. Two patients sought medical attention, and one patient's urine and serum tested positive for 11-nor-9-carboxy-delta 9-tetrahydrocannabinol (THC-COOH), a marijuana metabolite. The findings in this report demonstrate the utility of a collaborative investigation by public health and law enforcement. The findings also underscore the need to consider marijuana as a potential contaminant during foodborne illness investigations and the importance of identifying drug metabolites by testing of clinical specimens soon after symptom onset.

On the morning of April 7, 2009, a preschool teacher put brownies, which she had purchased on April 5, on a table in a break room to share with staff. The day before, she also had given two brownies to her adult son at home. Five preschool teachers (not including the

teacher who had purchased the brownies) and the teacher's adult son were the only persons who ate the brownies. Each person ate only one brownie. At approximately 1:30 p.m., the preschool director and the administrator noticed that one of the teachers suddenly looked drowsy and was complaining of drowsiness, ataxia, dizziness, shortness of breath, and numbness and tingling of the face, forehead, arms, and hands. When the director and administrator learned that the teacher who had shared the brownies had purchased them from a sidewalk vendor for a church fundraiser, they suspected the affected teacher's drowsiness was associated with her ingestion of the brownie 30 minutes before onset of symptoms. The teacher did not seek medical care.

The brownies were sold as single, unlabeled units, individually wrapped in plastic wrap, costing \$1.50 each. The preschool director contacted the head pastor of the church, who reported that the church had not held a fundraiser, and the pastor subsequently notified LAPD to investigate. After interviewing persons at the church and the preschool, LAPD suspected foodborne illness and contacted DPH on April 8.

Public health officials conducted a site visit at the preschool on April 9 and used a standard questionnaire to interview the affected persons about food history, medical history (including any drugs, herbal supplements, or medications taken), symptoms experienced, and time to onset. No one reported taking any medications or herbal supplements. DPH and LAPD later discovered that the son of the teacher who had purchased the brownies also was possibly exposed, and DPH interviewed him using the same questionnaire on April 21. All six affected persons reported never having used marijuana or any other illicit drugs. The brownies were the only common food item reported among the affected persons. All six affected persons reported at least nine symptoms,

and all had drowsiness, fatigue, and ataxia. All the affected preschool teachers were able to continue conducting classes that day. The time to onset of symptoms after ingesting the brownie ranged from 30 minutes to 3 hours, with a mean of 93 minutes.

Investigators considered a broad spectrum of etiologies, and consulted the DPH Technical Advisory Group (TAG) to develop investigative strategies. The TAG is a cadre of subject matter experts who possess security clearances and routinely share and assess investigation information between public health and law enforcement. The TAG includes a medical toxicologist, psychiatrist, laboratorian, veterinarian, specialists in environmental health, infectious disease, and radiation management, and a local FBI official. The clinical history and timing of events did not support a psychogenic etiology; each of the affected persons consumed a brownie at a different time of the day and experienced and reported symptoms independently at various times throughout the day. Moreover, some of the affected persons reported their symptoms to preschool administrators the next day, without knowledge of the previous day's events. Based on the constellation of reported symptoms, affected persons were asked about specific exposures to similarly acting agents, such as Jimson weed or diphenhydramine. Several affected persons reported that the brownies had a medicine-like aftertaste or smell; however, all six affected persons ate an entire brownie. One teacher (who did not report symptoms and was not included in the analysis) reported biting a brownie but immediately spitting it out, complaining of an unusual taste.

Two of the teachers sought medical attention at urgent-care facilities on the day of exposure: one was a breastfeeding mother, and the other had the most profound illness compared with the rest of the affected persons (illness that in-

cluded cardiopulmonary symptoms). The latter was diagnosed with food-borne illness and was prescribed antibiotics. The breastfeeding mother nursed her infant at 9:00 a.m., approximately 90 minutes after eating the first half of her brownie. The infant did not show any signs of illness. The mother ate the second half of her brownie at 1:00 p.m. As part of the medical evaluation, she underwent serum and urine toxicology screening at approximately 7:00 p.m. that evening. The blood and urine samples were screened at a clinical laboratory for amphetamines, barbiturates, benzodiazepines, cocaine metabolites, cannabinoids, methadone, methaqualone (urine only), opiates, phenylcyclidine, and propoxyphene metabolites by immunoassay and confirmed by gas chromatography-mass spectrometry (GC/MS). Serum parent-compound 9-delta-tetrahydrocannabinol (THC) level was <1 ng/mL, and THC-COOH was 27 ng/mL. Urine THC-COOH level was 66 ng/mL. Subsequent urine drug screenings of all six of the exposed persons (collected >8 days postexposure) were negative for cannabinoids and all the other drugs screened in the panel described. On May 20, a recovered sample of brownies was tested at the LAPD Scientific Investigation Division Laboratory for these same substances and additional substances (e.g., anabolic steroids) by GC/MS and was found to be positive for cannabinoids.

All affected persons recovered completely within hours after the exposure. Symptom duration ranged from 3 to 10 hours, with a mean of 6.25 hours. DPH environmental health inspectors and LAPD conducted a search on April 19 but were unable to locate the sidewalk vendor. No charges were brought against the teacher who purchased the brownies. No further complaints from affected persons or reports of additional symptomatic persons have been received to date. The sidewalk vendor has not been located to date.

Reported by: S Fogleman, MSN/MPH, C Rangan, MD, J Kennedy, MPH, M Santos, M Kim, MD, R Reporter, MD, SM Teutsch, MD, JE Fielding, MD, D Diamond, MD, Los Angeles County Dept of Public Health.

CDC Editorial Note: Marijuana is the most commonly used illicit drug in the United States. Among persons aged ≥ 12 years, an estimated 5.8% had used the drug during the preceding month, according to the 2007 National Survey of Drug Use and Health.^{1,2} Inadvertent marijuana ingestion has been reported previously.³⁻⁷ Similar episodes of inadvertent ingestion of marijuana occurred in Colorado in 1978³ and in California in 1981,⁴ where persons unknowingly ingested marijuana in baked goods. The constellation of symptoms described in this report is similar to other instances in which persons reported drowsiness,^{4,5,7} fatigue,⁶ ataxia,^{6,7} and dizziness.^{3,4,6} Accidental marijuana ingestion has led to coma in children.⁵ Therefore, pediatricians should be alert for signs of accidental ingestion.

THC is the major psychoactive ingredient of marijuana and is lipophilic. After exposure, THC is rapidly incorporated and distributes to the adipose tissue, liver, lungs, and spleen. It is then released back into the blood slowly and eventually is metabolized and changed into THC-COOH, which is excreted in the urine. THC-COOH is the most important compound for clinical testing purposes, and GC/MS procedures are considered the gold standard for testing.⁸

Multiple factors can influence the duration of detectability of THC metabolites in the urine, including frequency of marijuana use, timing of specimen collection, body fat content, and degree of urine dilution. The window of detection for THC-COOH ranges from a few days in infrequent marijuana users to weeks or months in frequent users.⁸ A previous study revealed an average detection duration of approximately 6 days among subjects who ingested marijuana-laced brownies containing a total dose of 22.4 mg THC (equivalent to the amount in one standard marijuana cigarette) and approximately 6.5 days from the same subjects after ingesting 44.8 mg THC.⁹ Although the dose of marijuana ingested by the affected persons described in this report is unknown, negative test results for

specimens obtained >8 days after exposure would be an expected result if the THC equivalence in the brownies was similar to the recreational dosing that was given in that study.⁹

The collaborative investigation was notable for the coordination between public health officials and law enforcement during the outbreak. The benefits of law enforcement involvement included early notification of the event to public health officials, collaborative interviews of the brownie purchaser, and assistance in testing urine specimens and the brownie sample at the LAPD laboratory. The demonstrated cooperative investigation and response capabilities included collection of clinical specimens in the context of foodborne illness with suspected chemical contamination, maintenance of chain-of-custody of laboratory specimens, maintenance of confidentiality of health information, and exclusion of psychogenic illness in the presence of unusual neurologic symptoms.

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