Important Information about Clinical Manifestations, Toxicity, and Treatment of Cannabis and Cannabinoid Exposure

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Background:

With the legalization of recreational marijuana, it is anticipated that there will be a rise in the number of patients presenting to health care facilities with complaints related to marijuana exposure. Of particular concern, is the potential for increased numbers of pediatric exposures due to the widespread availability of edible marijuana products. (1,2,3) In Colorado, the three groups that presented to the emergency department after legalization included adults who had ingested edibles that had much higher concentrations than they had been used to; adolescents with hyperemesis syndrome and children who accidentally ingested edibles.

Marijuana consists of the leaves and flowering parts of the Cannabis plant, which contain compounds known as cannabinoids. The principle psychoactive cannabinoid is delta-9-tetrahydrocannabinol (THC). Marijuana is usually smoked in cigarettes or pipes or added to food. Resin from the plant may be extracted (sometimes using butane) and used as a concentrated oil. The oil can be further dried into a "wax" or compressed into blocks (hashish). The concentrations of THC vary significantly in these formulations (4,5).

Clinical manifestations and toxicity

The clinical effects of THC use, including time of onset and duration of effect vary with the dose, route of administration (ingestion slower than inhalation) and the experience of the user. Acute cannabis intoxication may result in impaired driving and motor vehicle accidents.

> *Psychological effects:* Variable effects are described, including relaxation, euphoria, heightened sensory awareness, and altered time perception. Severe intoxication may result in anxiety, impaired short term memory, visual hallucinations and acute paranoid psychosis. Cannabis use may precipitate or exacerbate psychosis in individuals with underlying psychiatric conditions.
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> *Physiological effects*: Increases in heart rate, orthostatic hypotension, conjunctival injection, incoordination, slurred speech and ataxia are described.
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> *Chronic heavy marijuana use:* Various psychiatric disorders, pulmonary disease, increased risk of coronary heart disease, and reduced fertility have all been described. In addition, a syndrome of recurrent vomiting known as cannabinoid hyperemesis syndrome is also described. (4,5,6)
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> *Children:* More significant toxicity has been reported in young children including significant central nervous system depression.

Treatment

Most psychological disturbances can be managed by simple reassurance, supportive care, and possible adjunctive use of benzodiazepines (such as for adolescents with hyperemesis.) Many other disease processes mimic intoxication, and a broad differential diagnosis that includes infectious, metabolic and primary neurologic causes should also be considered when treating patients with suspected intoxication.

Providers or public can contact the California Poison Control Center at 800-222-1222 with any questions regarding overdose or symptoms after taking drugs.

References

(1) Wang GS, Roosevelt G, Heard K. Pediatric marijuana exposures in a medical marijuana state. JAMA Pediatr. 2013;167:630-633.

(2) Wang GS, Roosevelt G, Le Lait MC, et al. Association of unintentional pediatric exposures with decriminalization of marijuana in the United States. Ann Emerg Med. 2014;63:684-689.

(3) Vo et. al. Cannabis intoxication Case Series: The Dangers of Edibles Containing Tetrahydrocannabinol

(4) Olson Poisoning and Drug Overdose, Seventh edition, McGraw Hill 2018

(5) Goldfrank's Toxicologic Emergencies, Tenth edition, McGraw Hill 2015

(6) Galli JA, Sawaya RA, Friedenberg FK. Cannabinoid Hyperemesis Syndrome. Curr Drug Abuse Rev. 2011 Dec; 4(4):241-249.