FIVE THINGS TO KNOW ABOUT ...

Synthetic cannabinoids

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1

Synthetic cannabinoids are not synthetic marijuana

Synthetic cannabinoids are a large family of chemically unrelated compounds functionally similar to delta-9-tetrahydrocannabinol (THC), the active component of *Cannabis sativa*.[1,2] However, synthetic cannabinoids are not derived from cannabis and, unlike THC, are full agonists at cannabinoid receptors with biologically active metabolites; they are, therefore, more potent than THC.[1] These compounds are typically sprayed on herbal mixtures marketed as "spice," "herbal incense" or "K2" and labelled as "not for human consumption" or "for aromatherapy use only."[1] Smoking is the most common route of administration, although oral, pulmonary (via vapourization) and rectal administration have been described.[3]

2

Use of synthetic cannabinoids is increasing

According to the American Association of Poison Control Centers, 6959 calls were received in 2011 related to synthetic cannabinoid exposure, compared with 2906 calls in 2010.[4] The typical users are adolescent males and young men in their early to mid-20s, with the most commonly stated reasons for use being curiosity, relaxation and attaining the desired effects of THC while avoiding toxicological detection.[1,3] Almost all (99.3%) synthetic cannabinoid users surveyed reported previous cannabis use, and coingestion of additional recreational drugs is common.[3,5] Although readily procured via the Internet, synthetic cannabinoids cannot be legally sold in Canada.

3

Clinical manifestations of toxicity are varied

Synthetic cannabinoid use has been associated with psychosis, agitation, seizures, acute kidney injury, hypokalemia, hypertension, tachycardia, myocardial infarction and, occasionally, death (Box 1).[1,2,6] Clinical manifestations vary with dose, product composition, individual susceptibility and coingestion of other drugs. However, there is often no way for clinicians to reliably gauge the nature and amount of product used by patients. Although the pharmacokinetic profiles of these compounds are poorly characterized, users report shorter duration of action and time to peak effect relative to THC.[5]

4

Diagnosis requires a high index of suspicion

Because synthetic cannabinoids are not detected by urine immunoassay tests for THC, a high index of suspicion for these compounds is required when evaluating unexplained onset of acute psychosis or a toxidrome consistent with cannabinoid use.[1,7] Although some synthetic cannabinoids can be detected by chromatography, the utility of these tests is limited by the changing composition of commercial products containing these compounds.[1]

5

Treatment is supportive

No specific antidote exists for synthetic cannabinoid toxicity.[2] Benzodiazepines are used to treat agitation and seizures, and antipsychotics may be required for unremitting psychotic symptoms.[2]

Box 1: Adverse effects of synthetic cannabinoids[1,2,6]

Psychiatric	Psychosis (new-onset or exacerbation of pre-existing disease), agitation, anxiety, irritability, confusion, aggression, suicidality, memory changes, tolerance, withdrawal, dependence
Cardiovascular	Hypertension, tachycardia, ST-segment changes, chest pain, myocardial infarction, tachyarrhythmia
Neurologic	Generalized seizures, somnolence, brisk reflexes
Gastrointestinal	Nausea, vomiting, anorexia, increased appetite
Other	Hypokalemia, conjunctival injection, hyperglycemia, acute kidney injury, xerostomia, diaphoresis

For references, please see Appendix 1, available at www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.130510/-/DC1

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