FIVE THINGS TO KNOW ABOUT ...

Dextromethorphan abuse

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1 Dextromethorphan is more than an innocuous antitussive

At large doses used recreationally (300 to > 1500 mg), dextromethorphan and its metabolite dextrophan block *N*-methyl-D-aspartate receptors, producing dissociative effects similar to those of phencyclidine and ketamine.[1] Neurobehavioural effects can begin within one hour after ingestion, are dose-related and are described by users as occurring in "plateaus" (Box 1).[2,3] Adrenergic effects (e.g., hypertension, diaphoresis) can result from dose-related inhibition of catecholamine reuptake, and serotonergic effects can result from agonist effects at serotonin receptors.[4] Serotonin syndrome can also arise from interactions with serotonergic drugs.[2,3]

Box 1: "Plateaus" of dextromethorphan toxicity*[2,3]

Plateau 1 (1.5–2.5 mg/kg)
- Total intake 100–200 mg (4–6 capsules or 35–60 mL of syrup)
- Restlessness, euphoria

Plateau 2 (2.5–7.5 mg/kg)
- Total dose 200–500 mg (7–18 capsules or 60–185 mL of syrup)
- Exaggerated auditory and visual sensations, closed-eye hallucinations, imbalance

Plateau 3 (7.5–15 mg/kg)
- Total dose 500–1000 mg (18–33 capsules or 185–375 mL of syrup)
- Visual and auditory disturbances, altered consciousness, delayed reaction times, mania, panic, partial dissociation

Plateau 4 (> 15 mg/kg)
- Total dose > 1000 mg (> 33 capsules or > 375 mL of syrup)
- Hallucinations, delusions, ataxia, complete dissociation

*Assuming a 75-kg person, 30-mg capsules and 3 mg per millilitre of syrup.

2 Use is increasing among adolescents

According to the Ontario Student Drug Use and Health Survey, 9.7% of students in grades 7 to 12 reported using dextromethorphan recreationally in 2013, compared with 6.9% in 2011.[5] Most dextromethorphan-related calls to poison control centres involve adolescent males and solid dose formulations of the drug.[6]

3 Clinical effects may be influenced by combined-formulation drugs

Some effects attributed to dextromethorphan may reflect ingestion of combination drugs, particularly decongestants, acetaminophen and anticholinergic antihistamines.[2,4] Because dextromethorphan is not detected by basic drug screens, toxicity secondary to its use should be considered when evaluating patients with a dissociative toxidrome.[2,4]

4 Treatment is supportive

No specific antidote exists for dextromethorphan toxicity.[3,5] Guidelines suggest benzodiazepines for seizures and aggressive cooling measures for hyperthermia. Naloxone can be considered for use in patients in a coma or with respiratory depression, although clinical response is varied.[2,4] Acetaminophen levels should be obtained when concomitant ingestion is suspected, and additional measures for the management of associated complications (e.g., delayed hepatic injury related to acetaminophen overdose) implemented as appropriate.[2,4]

5 Withdrawal can occur

Anecdotal reports from long-term users (i.e., months to years) have described intense cravings, flashbacks and hallucinations within three days after stopping dextromethorphan.[2,3] Physical symptoms of withdrawal include diarrhea, vomiting and rigors. Symptoms typically resolve within two days without specific treatment.[1]

See references, Appendix 1, www.cmaj.ca/lookup/suppl/doi:10.1503/cmaj.131676/-/DC1

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