



Mammoth Hot Springs, Yellowstone National Park

PIC QUESTION OF THE WEEK: 10/03/11

Q: What is the significance of dextromethorphan abuse in children and adolescents?

A: Dextromethorphan (DM) is a codeine analogue used to increase the cough threshold without activating the mu and delta receptors that cause analgesia and addictive behavior. Clinical doses for antitussive effects are age dependant and range from 5-30 mg every 6 hours. At normal doses, no addictive signs, euphoria, or hallucinations have been reported; however, because a euphoric effect can occur at high doses, the drug has been abused since its approval in 1958 (Romilar®). The product was discontinued in the 1960's because of diversion and abuse. It was reformulated to make the syrup less palatable in anticipation that the unpleasant flavor would deter misuse. An encapsulated dosage form was introduced in the 1990s, thus increasing the ease of abuse by simple ingestion of numerous capsules. Misconceptions about the drug's safety and the ease of obtaining the medication have further promoted its abusive potential. Children and adolescents are the primary abusers of DM, known on the street as *Triple C*, *Skittles*, *Red Hot*, or *Robo*. Young people will often take DM in a practice referred to as "sheeting," the ingestion of a full blister pack at one time. There are numerous case reports of toxicity, hospitalization, and death due to abuse of DM. One case report describes a 19-year-old female who was originally misdiagnosed and treated for a seizure disorder. Months later, the patient admitted to abusing dextromethorphan. Many surveys in elementary and junior/senior high schools have shown that up to 10% of adolescents have used cough and cold products for recreational purposes. The Coricidin® brand of DM products is often the most desirable, likely due to its dose of 30 mg per capsule. The effects of dextromethorphan are dependent upon the amount of drug ingested and the development of tolerance by long term users. The response can be categorized in four phases:

Phase	Dose	Symptoms
1	1.5-2.5 mg/kg	euphoria, restlessness, increased sensitization
2	2.5-7.5 mg/kg	increased energy, exaggerated sensations, some hallucinations
3	7.5-15 mg/kg	mania, semi-consciousness, impaired cognition
4	>15 mg/kg	hallucinations, "out-of-body" dissociation, ataxia, nystagmus, seizures, coma

Toxicity from the agents combined with DM is also of concern. Ingredients including acetaminophen and H₁ antagonists can result in hepatic toxicity and anticholinergic effects, respectively. N-acetylcysteine and physostigmine have been used to manage these toxicities. Treatment of DM overdose is generally supportive and includes fluid replacement. Education of parents and adolescents is of utmost importance in reducing the abuse of dextromethorphan.

References:

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