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Synthetic cannabinoids to avoid urine drug screens: Implications for contingency management and other treatments for drug dependence

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Abstract

Contingency management (CM) is an effective treatment for substance use dependence. Within CM, rewards or vouchers promote continued abstinence by acting as alternative reinforcers to substance use. However, CM relies on the use of accurate biochemical verification methods, such as urinalysis, to verify abstinence. Synthetic cannabinoids (SCs) pose a risk for CM treatment because they are not easily detected by common urinalysis techniques. Although SCs pose a risk, there is limited information regarding current rates of SC use within substance dependent populations as well as rates of substance use and psychiatric disorders among those who use SCs in treatment. We discuss emerging research on these topics and potential implications for CM treatments. Findings suggest CM researches should test for and query SC use among those being treated for cannabis and cocaine use problems as well as among younger populations of substance users. Implications of other novel psychoactive substances for drug treatment and drug urinalysis are also discussed.

Keywords

synthetic cannabinoids; synthetic marijuana; spice; contingency management; drug treatment

Contingency management (CM) treatments are among the most empirically supported treatments for drug abstinence (Bigelow & Silverman, 1999). Based on the principles of operant conditioning, CM treatments have primarily been used in interventions that regularly monitor drug use via urinalysis and provide incentives upon verification of drug abstinence, as the positive reinforcement value of the incentive is thought to compete with the rewarding properties of the drug of choice (Stitzer and Petry, 2006). In this way, CM for drug

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dependence is unique from other drug treatments in that it relies on biochemical verification of abstinence to provide incentives. Without accurate information in this realm, the theoretical underpinnings of CM treatments for drug dependence could be directly undermined.

Synthetic cannabinoid receptor agonists (SCs) represent a group of drugs that pose a significant barrier to biochemical verification and thereby the use of CM with those who use this drug. This is particularly the case given that this drug can be used specifically with the purpose of continuing drug use while still being able to avoid testing positive on urine drug tests (Ninnemann & MacPherson, 2015); SC use is only detectable with advanced techniques that are not commonly employed in drug treatment. SCs are effective in remaining undetected because drug urinalysis tests specifically for 9-tetrahydrocannabinol (THC), which is not an active chemical compound in SCs. Rather, SCs are comprised of chemicals that are either structurally similar to THC or act on the same brain receptors as THC (Auwarter, Dargan, & Wood, 2013). In the past two years, calls to poison control centers due to complications from the ingestion of SCs have risen from 2,668 in 2013 to 7,779 in 2015 (AAPCC, 2015). At present, many SCs have been outlawed internationally; however, producers often replace recently criminalized SCs with novel, uncontrolled SCs. SCs are available for purchase at a wide range of outlets including convenience stores and from online vendors (Vandrey, Dunn, Fry, & Girling, 2012). Taken together, SCs represent a diverse group of drugs that are easy to access and have a high potential for negative effects.

As aforementioned, urinalysis is the primary mode of testing abstinence from drug use in CM treatments for substance use problems. Because it is not possible to test for SCs using urinalysis, it is clear that SCs have the potential to undermine (a) the abstinence-reinforcement connection inherent to CM, (b) the results of outcome studies examining CM for drug dependence, and (c) an individual's progress toward sobriety.

Initial research has found that 38% of those enrolled in a residential drug treatment program reported ever using SCs and that 70% of those individuals reported avoiding drug tests as a motive for SC use (Bonar, Ashrafioun, & Ilgen, 2014). While replications in other samples are crucial, this work does establish the prevalence of SC use and its instrumental use to limit drug detection in treatment.

Extending this work in other important directions, our research team was interested in exploring the characteristics of those who use this drug and psychiatric impairment evidenced. Our study was designed to explore the characteristics of those who do and do not use SCs in a residential drug treatment sample of 285 patients who were predominantly low income minority substance users. Results indicated that past 12 month SC users ($n = 62$) were at significantly greater odds of meeting diagnostic criteria for current cannabis dependence and current cocaine dependence than never users. In addition, SC users had greater odds of meeting criteria for both Lifetime and Current Major Depressive Disorder as compared to never users, but evinced no differences between never users in anxiety disorders or personality disorders. Finally, our study showed SC users were significantly younger than non-users (A more detailed report of these results are provided in Ninnemann, Lechner, Borges, & Lejuez, Under Review).

Importantly, our findings suggest that SCs may pose particular risk to CM treatments for cannabis use and cocaine use. In addition, our results suggest that SC users are often younger, a finding which extends to SC users in the general population. As marijuana is the most used drug by adolescents (Johnston, O'Malle, Miech, Bachman, & Schulenberg, 2015), CM treatments for cannabis use in adolescent populations in particular should be cognizant of the risks SC use poses to treatment adherence.

Given this growing literature on SCs, we recommend that individuals conducting clinical trials of CM for the treatment of cannabis use and cocaine use query clients for SC use prior to study enrollment. This of course is not to say that SC use should be ignored for those dependent on other drugs, but that particular attention appears warranted for those dependent on these two drugs. Such querying is important because it can provide early indication of for whom CM contingencies might be less viable or it may suggest the need for more costly toxicology testing for specific SC metabolites. While reporting using toxicology tests will not be immediate, and thus may not be useable for the provision of reinforcement based on abstinence in CM, it would provide important contextual information to understanding whether SC use impacted treatment outcomes. Notably, individuals under the influence of SCs often experience acute sympathomimetic-like effects, including tachycardia, increased blood pressure, and mydriasis (i.e., pupil dilation) (Forrester, Kleinschmidt, Schwarz, & Young, 2012), that clinicians may be able to recognize when treating patients. With this recognition in mind, drug treatment providers, both within the context of CM and beyond it, may benefit from direct conversations with clients about SCs if use is suspected. It is also important to note that SCs represent only one set of the large, heterogeneous group of drugs known as novel psychoactive substances (NPS). As such, it is important to investigate for which other NPS the avoidance of urine drug screens may be a motive for use. Particular attention to benzodiazepine- (e.g., nifoxipam) and opioid-like (e.g., W-18) NPS may be warranted given recent increases in opioid and sedative prescription drug dependence. In sum, CM for drug dependence is one of the most efficacious treatments in existence for short-term sobriety from drug use. It is important we consider SC use to ensure that the potential success of CM treatments are not undercut by them.

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Highlights

- In CM rewards promote abstinence by acting as alternatives to substance use.
- CM relies on biochemical methods, such as urinalysis, to verify abstinence.
- Synthetic cannabinoids (SCs) are not detected by common urinalysis techniques.
- CM treatments for cannabis and cocaine should query SC use.
- CM treatments for adolescents and young adults should query SC use.