



Smoking cessation and adolescent treatment response with comorbid ADHD^{☆,☆☆,★}



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ABSTRACT

Minors entering treatment for alcohol and other drug (AOD) use disorders tend to smoke at high rates, and many have comorbid attention deficit hyperactivity disorder (ADHD). Clear-air laws force patients to refrain from smoking on the premises of AOD treatment facilities, which may hinder the progress of treatment-seeking populations who smoke and struggle with ADHD comorbidity in particular. This study explores clinical characteristics associated with smoking among youths presenting for residential treatment, clinical characteristics associated with smoking cessation, and the impact of smoking cessation with ADHD comorbidity on AOD treatment response. Participants were 195 adolescents (52% female, aged 14–18 years) court-referred to residential treatment. Data were collected at intake, prospectively each week for the 10-week treatment period, and at discharge. Two-thirds (67%) of the enrollment sample entered treatment smoking half a pack a day on average, a large proportion (50%) of which did not smoke during treatment. ADHD patients were more likely to smoke before and during treatment except for those who got active in service and step-work. Quitting smoking did not adversely affect AOD outcomes and was associated with better prognosis of lowered AOD cravings for youths with and without ADHD. Smoking cessation during adolescent AOD treatment is recommended with provision of pharmaceutical and/or behavioral modalities that reduce nicotine withdrawal.

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1. Introduction

Tobacco use is the number one preventable cause of disease, disability, and death in the United States (CDC, 2010a). Some populations are more at risk of tobacco use disorders than others. Whereas approximately one out of every four Americans smokes, three out of four individuals with alcohol and other drug (AOD) use disorders are smokers (Bobo & Husten, 2000; Grant, Hasin, Chou, Stinson, & Dawson, 2004).

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Furthermore, smoking is more likely to kill patients than the AOD problems for which they sought treatment (Hser, McCarthy, & Anglin, 1994; Hurt et al., 1996). Neuropsychiatric disorders characterized by impaired cognition and impulsivity such as attention deficit hyperactivity disorder (ADHD) also increase the risk of tobacco use disorders; smoking rates are twice as high among individuals with ADHD than the general population or controls without ADHD (Kollins, McClernon, & Fuemmeler, 2005). Minors are also disproportionately vulnerable to tobacco use disorders; tobacco use frequently starts in adolescence, and 80 percent of teen initiators continue to smoke into adulthood, curtailing lung growth, brain development, and longevity (CDC, 2010b; DiFranza et al., 2002; Kandel & Chen, 2000). The risk of tobacco use disorders and associated medical comorbidity is compounded for substance dependent youths with ADHD (Biederman et al., 2006).

The last few decades have witnessed an explosion of pharmacological aids in the treatment of nicotine dependence, alcohol and drug addiction, and ADHD, including: 1) nicotine replacement therapies (NRTs) to aid smoking quit attempts (American Cancer Society, 2015); 2) naltrexone and acamprosate to reduce the reinforcing qualities of alcohol (Bouza, Magro, Muñoz, & Amate, 2004); 3) suboxone and methadone replacement pharmacotherapies for the treatment of narcotic use disorders (Miller, Wilbourne, & Hettema, 2003); and 4) stimulants for

the treatment of ADHD. ADHD pharmacotherapies, in particular, have demonstrated large effects ($d = 0.80$) in reducing ADHD symptoms and in preventing addiction among young adults (Jain, Jain, & Islam, 2011; Lambert & Hartsough, 1998).

1.1. Treatment

Despite these biomedical advances, associated benefits do not reach populations who suffer the most with all three conditions, and minors in particular. Co-existing tobacco-use disorders are often inadequately addressed in AOD treatment programs, as patients are frequently warned not to tackle smoking cessation during treatment for fear of jeopardizing their progress with recovery from addiction (Gil & Bennett, 2000; Hahn, Warnick, & Plemmons, 1999). In fact, only 8% of clients are told by counselors to quit tobacco use during AOD treatment (Joseph, Willenbring, Nugent, & Nelson, 2004). For adolescent patients who want to quit smoking during AOD treatment, NRTs may not be readily available, prescribable to minors, or without cost. As well, comorbid ADHD often goes unrecognized, particularly among girls (Biederman et al., 1999; Gaub & Carlson, 1997). Even if recognized, stimulant medications are considered off-limits for AOD-dependent youths with ADHD due to the addictive potential of stimulants. Untreated nicotine withdrawal symptoms, AOD cravings, and impaired attention may decrease youths' chances of smoking cessation during treatment and increase their likelihood of treatment drop-out.

1.2. Smoking cessation and treatment response with comorbid ADHD

ADHD has high overlap with nicotine dependence, and may further challenge youths' ability to adhere to traditional treatment programs that are largely cognitive, behavioral, and social in nature. Given that ADHD is the most common psychiatric diagnosis of minors, the majority of individuals with AOD use disorders smoke (Friend & Pagano, 2005a, 2005b), and the smoke-free policies enforced at treatment facilities, the paucity of data on the impact of smoking cessation on AOD treatment response and in the presence of ADHD is surprising. Among adults, there is evidence that smoking cessation during AOD treatment is not associated with worse but improved drinking outcomes (Friend & Pagano, 2005a, 2005b, 2007), although there is some argument to consider quitting smoking once AOD treatment is completed (Joseph et al., 2004). In fact, adults who continue smoking show worse drinking outcomes (Cooney, Cooney, Pilkey, Kranzler, & Oncken, 2003). Among youths, smoke-free policies in adolescent treatment facilities show no negative effects on retention rates (Callaghan et al., 2007). Initial evidence suggests no negative effects of smoking cessation among adolescents admitted into psychiatric hospitalization for axis 1 disorders including substance use (Brown et al., 2009; Myers & Kelly, 2006). It is unclear whether these findings extend to adolescents entering treatment for substance dependency and how ADHD complicates the picture. The handful of effectiveness studies of AOD treatment among youth with psychiatric comorbidity have been limited by insufficient sampling of girls to understand effects of ADHD inclusive of ADD without hyperactivity. In practice, ADHD is not an assessed condition that qualifies for dual-diagnosis treatment.

1.3. Purpose of this paper

The ability to focus, process higher-level cognition, and endure AOD cravings is a challenge for most AOD dependent patients in the initial months of AOD abstinence. Agitation and nicotine cravings from not being able to smoke during treatment can add to this common mental fog in early AOD recovery. Now add irritability, difficulty with peers, and impaired attention from untreated ADHD (Mrug, Hoza, Pelham, Gnagy, & Greiner, 2007; Pliszka, Greenhill, Crismon, et al., 2000) that is no longer medicated by AOD or nicotine use. The deck may be stacked against AOD dependent smokers with comorbid ADHD making progress

in treatment. This paper aims to inform critical gaps between the mental health and addiction literatures by examining three research questions: 1) what are the clinical impairments associated with smoking among youths presenting for treatment?; 2) what are the characteristics of youths who successfully quit smoking during treatment?; and 3) what is the impact of smoking cessation on treatment response among smokers with and without ADHD? Understanding the interplay between smoking cessation, addiction, and ADHD can inform the integration and tailoring of treatment services to optimize patient health long-term.

2. Material and methods

2.1. Procedures

Data are drawn from a naturalistic, longitudinal study that enrolled a large, representative sample of AOD-dependent youths court-referred to treatment, selected for equal gender proportions to optimize generalization of study findings. Patients were recruited from a large adolescent residential treatment program in northeast Ohio. Inclusion criteria included: ages 14–18 years, English speaking, stable address and telephone, met diagnostic criteria (APA, 2000) for current AOD dependence, and medically stable. Exclusion criteria included: a major chronic health problem other than AOD disorders likely to require hospitalization, currently suicidal or homicidal, or expected incarceration in the subsequent 12 months. Participants were referred to AOD treatment from multiple sources, the most common of which were juvenile court (83%) and mental health professionals (65%). In the week before admission date, participants were sent an information packet with an invitation letter to participate in the study. Following admission, participants were approached to participate and given a brief description of the study. Participants were assured that their answers to study assessments would be kept confidential, and would not be shared with family members or treatment staff except when necessary to prevent harm to the participant or someone else. Eligible participants signed statements of informed assent with their parent/legal guardian providing informed consent. Participants were paid \$25 for completed assessments. All procedures of this study were approved by the University Hospitals Case Medical Center Institutional Review Board for human investigation, and a Certificate of Confidentiality from the National Institute on Alcohol Abuse and Alcoholism was obtained. The general aims, organization, and research design of longitudinal investigation can be read about in further detail elsewhere (Kelly, Pagano, Stout, & Johnson, 2011).

2.2. Setting

New Directions is a 24-hour monitored, intensive residential AOD treatment program lasting two months on average ($M = 2.2$) that provides a range of evidenced-based therapies. Using the Drug and Alcohol Program Treatment Inventory (Swindle, Peterson, Paradise, & Moos, 1995), the top five treatment modalities at the site are cognitive-behavioral ($M = 11.0$), psychodynamic ($M = 11.0$), therapeutic community ($M = 10.0$), family ($M = 9.0$), and 12-step facilitated ($M = 9.0$), and are comparable to other adolescent AOD programs (Kelly & Urbanoski, 2012). Each week, clients spend approximately 20 hours in therapeutic activities and attend up to five 12-step meetings in the local community. Nicotine use is not allowed inside or outside the grounds of the facility. Nicotine patches are available upon client request, and clients are permitted to smoke when on pass or attending local 12-step meetings. Addiction medications and schedule II–IV medications (i.e. controlled substances) are not available to clients in adolescent AOD treatment.

2.3. Participants

A total of 482 adolescents were admitted into AOD treatment during the study enrollment period from February 2007 to August 2009. All

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