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Physician practices to prevent ADHD stimulant diversion and misuse

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ABSTRACT

Background: Recent studies report that a significant number of adolescents misuse and divert prescription stimulants. As prescribers of these medications, physicians have a unique opportunity to help prevent the improper use and unlawful distribution of these medications. This study evaluates the extent to which physicians employ prevention practices with their adolescent patients with ADHD and their perceptions of the effectiveness of these practices.

Methods: A questionnaire was developed and mailed to child and adolescent psychiatrists, child neurologists, and developmental-behavioral pediatricians in the US. Descriptive statistics were performed on the final sample ($n = 828$; response rate = 18.4%), as were regressions to identify differences when physicians were grouped by subspecialty and prescribing volume.

Results: Many physicians "never" or "rarely" use medication contracts (85.2%) or distribute print materials (81.0%) to patients with ADHD when they suspect misuse and/or diversion. 46.2% do not "often" refer for drug counseling or substance abuse treatment when they suspect a patient of stimulant misuse and/or diversion. The leading prevention practices implemented by physician respondents at least "often" when they suspect stimulant misuse and/or diversion are prescribing long-acting instead of immediate-release stimulants (79.2%) and prescribing non-stimulants (71.9%). 71.4% of respondents believed prescribing non-stimulants is "very effective" at preventing misuse and diversion. Conversely, 53.4% and 31.5% of physicians, respectively, labeled using a medication contract and distributing print materials as "not likely effective." Child and adolescent psychiatrists were more likely to implement certain prevention practices compared to other subspecialists. Many responding physicians do not regularly implement practices that may prevent stimulant misuse, and the majority thinks most prevention practices are not very effective.

Conclusion: Physicians should assume greater responsibility in the prevention of stimulant misuse and diversion by implementing prevention practices more often with their adolescent patients with ADHD. With respect to the generalizability of these findings, it must be noted that the sample was limited to pediatric subspecialists and may be influenced by selection bias and response bias. Further research must be performed to better understand physicians' views of the risks and benefits of stimulants and to ascertain best practices for the prevention of stimulant misuse and diversion.

1. Introduction

The American Academy of Pediatrics (AAP) recognizes Attention-deficit/Hyperactivity Disorder (ADHD) as the most common childhood neurobehavioral disorder (Subcommittee on Attention-Deficit/Hyperactivity Disorder, Steering Committee on Quality Improvement and Management, 2011). In recent years, there has been an increase in ADHD diagnoses: 11% of children aged 4–17 were diagnosed with ADHD in 2011, up from 9.5% in 2007 and 7.8% in 2003 (Visser et al., 2014). The largest increase was observed among adolescents aged 15–17; ADHD diagnoses in this population rose 52% between 2003 and 2011 (Collins & Cleary, 2015). Prescriptions have also increased, with 6.1% of children aged 4–17 taking some form of ADHD medication in 2011 compared to only 4.8% in 2007 (Visser et al., 2014). Concerns have been raised because this rise in prescriptions has provided more opportunity for the illegal diversion and unsafe misuse of these medications. In light of the increased availability of these medications, the medical community must give greater attention to the prevention of stimulant misuse and diversion.

Using terminology as defined in other studies (Wilens et al., 2008), "diversion" refers to the exchange (selling or giving away) of controlled medications and "misuse" refers to the use of a controlled medication

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either in a way that was not prescribed or by a person who was not prescribed the medication by a licensed healthcare provider. The misuse and diversion of prescription stimulants is concerning because of their associated adverse health and legal consequences. Stimulants commonly prescribed for ADHD, such as amphetamines and methylphenidate, are classified by the U.S. Drug Enforcement Administration as Schedule II controlled substances (U.S. Department of Justice, Drug Enforcement Administration, Office of Diversion Control). Thus, stimulant use carries risk for abuse and severe psychological or physical dependence (U.S. Department of Justice, Drug Enforcement Administration, Office of Diversion Control), and may cause adverse cardiovascular or psychiatric side effects (Brunton, Chabner, & Knollmann, 2011). Misuse of these medications is particularly dangerous as individuals with certain pre-existing medical conditions may be more susceptible to these side effects (Brunton et al., 2011). Additionally, there are legal consequences if a person is caught diverting his or her stimulant medication, with punishments ranging from a fine to incarceration (CriminalDefenseLawyer).

Recent studies find that a significant number of adolescents misuse stimulants (Cottler, Striley, & Lasopa, 2013; McCabe, Teter, & Boyd, 2004; McCabe & West, 2013; McCauley et al., 2010; Poulin, 2001, 2007; Viana et al., 2012; Wilens et al., 2008) highlighting the importance of increased focus on this issue. One literature review found that 5–9% of grade and high school-aged students reported non-medical use of prescription stimulants in the past year (Wilens et al., 2008), and a study of only high school seniors found a 9.5% prevalence rate of lifetime non-medical stimulant use (McCabe & West, 2013). Further, the number of emergency department visits related to nonmedical use of ADHD stimulant medication tripled over a 5-year interval (from 5212 visits in 2005 to 15,585 visits in 2010), indicating that a growing number of individuals are experiencing negative health effects from stimulant misuse (Substance Abuse and Mental Health Services Administration, 2013). Other studies have reported on stimulant diversion (DeSantis, Webb, & Noar, 2008; Garnier-Dykstra, Caldeira, Vincent, O'Grady, & Arria, 2012; McCabe & Boyd, 2005; McCabe et al., 2004; McCabe et al., 2011; Poulin, 2001, 2007; Rabiner, 2013); one specific study found 26% of students in grades 7, 9, 10, and 12 prescribed methylphenidate diverted their medication either by giving it away or selling it (Poulin, 2007). Physicians also recognize that stimulant diversion and misuse is common among adolescents. In a recent study, 59% of physicians suspected at least one of their adolescent patients with ADHD had diverted their stimulants in the past year, and 74% believed that they had seen at least one patient feigning ADHD symptoms in an attempt to obtain stimulants for non-medical purposes within that same time period (Colaneri, Keim, & Adesman, 2016). More than one third of physicians in this same study also thought stimulant diversion was common or very common among adolescents with ADHD (Colaneri et al., 2016). Studies also report concerning rates of stimulant misuse and diversion among college students (DeSantis et al., 2008; Garnier-Dykstra et al., 2012; Hall, Irwin, Bowman, Frankenberger, & Jewett, 2005; Rabiner, 2013; Rabiner et al., 2009; Teter, McCabe, LaGrange, Cranford, & Boyd, 2006; White, Becker-Blease, & Grace-Bishop, 2006; Wilens et al., 2008).

In terms of motivations for misuse, many young people report misusing stimulants in order to increase their concentration and improve their academic performance (DeSantis et al., 2008; Garnier-Dykstra et al., 2012; Teter et al., 2006). In one study, 72% of students reported misusing stimulants to stay awake to study longer, and 66% misused stimulants to improve their concentration on academic work (DeSantis et al., 2008). At present, there is a growing movement promoting the use of stimulants for cognitive enhancement purposes. A recent survey by *Nature* provides evidence of this movement; one in five respondents to this survey reported they had used pharmaceuticals including methylphenidate for non-medical purposes such as to enhance concentration or memory (Maher, 2008). Although there is limited conclusive research regarding the actual effectiveness of ADHD stimulants like methylphenidate in enhancing cognitive abilities (Repantis, Schlattmann, Laisney, & Heuser, 2010), it remains problematic that individuals, particularly adolescents, are misusing stimulants as performance enhancers since this practice is illegal, possibly unsafe, and arguably unethical.

This mounting evidence of stimulant misuse and diversion by adolescents in conjunction with the growing popularity of pharmacological cognitive enhancement indicate an urgent need for prevention efforts aimed at youth with ADHD. As prescribers of these medications, physicians are in a unique position to work to prevent improper use and illegal distribution of stimulant medication. Thus, it is important to consider various strategies that physicians may employ to reduce stimulant misuse and diversion. In this study, we focus on several specific prevention strategies that have been noted in the literature (Levin, Evans, & Kleber, 1999; The National Center on Addiction and Substance Abuse at Columbia University, 2005), including medication contracts, print materials, limiting prescriptions to a smaller number of pills, pill counts, prescribing long-acting instead of immediate-release stimulants, prescribing non-stimulants instead of stimulants, and referring to substance abuse treatment.

One prevention strategy is the use of medication contracts—written agreements between a physician and patient that commit the patient to adhering to a specified treatment plan and medication regimen, which thus may prevent stimulant diversion and misuse (Burchman & Pagel, 1995; Fishman, Bandman, Edwards, & Borsook, 1999; The National Center on Addiction and Substance Abuse at Columbia University, 2005). Provision of printed educational materials to patients is another prevention strategy (The National Center on Addiction and Substance Abuse at Columbia University, 2005), as these materials can emphasize the potential health and legal consequences associated with stimulant misuse and diversion, and may help patients remember these special considerations after they leave the physician's office (Morris & Halperin, 1979). Physicians may also consider limiting the number of pills given to patients with each prescription to only those required for the month (DeSantis et al., 2008; Johnston, 2009; Levin et al., 1999). Additionally, pill counts involve the physician counting the number of pills that the patient has not taken at the next scheduled appointment so as to measure adherence (Farmer, 1999; Pylkas & Bart, 2014; The National Center on Addiction and Substance Abuse at Columbia University, 2005). The prescription of long-acting stimulants may also prevent improper use of stimulants, as immediate-release stimulants have a higher potential for abuse (Cascade, Kalali, & Weisler, 2008; Kollins, 2008; Levin et al., 1999; López & Leroux, 2013). Further, the prescription of non-stimulants instead of stimulants is an obvious prevention strategy, as non-stimulants do not carry the same concerns for abuse (Kollins, 2008; Levin et al., 1999; The National Center on Addiction and Substance Abuse at Columbia University, 2005). The referral of patients for substance abuse treatment is an additional strategy that may reduce future stimulant misuse (The National Center on Addiction and Substance Abuse at Columbia University, 2005).

There is currently a lack of studies that evaluates the extent to which physicians employ these strategies in an effort to prevent stimulant misuse and diversion. To our knowledge, the only report of prevention practices when physicians suspect misuse and diversion of controlled medications was performed by the National Center on Addiction and Substance Abuse at Columbia University in 2004 (The National Center on Addiction and Substance Abuse at Columbia University, 2005). Investigators administered a questionnaire that assessed physician practices with patients who were prescribed controlled prescription drugs (including opioids, central nervous system depressants, and stimulants). This unpublished study reported that when physicians suspected misuse, 23.1% performed pill counts, 36.9% created a medication contract/agreement with the patient, 19.0% offered educational materials, 50.6% prescribed non-controlled drugs to the patient, and 51.2% referred the patient to unspecified treatment. However, this study was conducted in 2004, so it is possible that prevention practices have changed since