Addictive Behaviors Reports 6 (2017) 96–101

Contents lists available at ScienceDirect

Addictive Behaviors Reports

journal homepage: www.elsevier.com/locate/abrep

One-year abstinence improves ADHD symptoms among patients with polysubstance use disorder

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ARTICLE INFO

Keywords:
Polysubstance
Recovery
ADHD
Substance use disorder

ABSTRACT

Introduction: Attention-deficit/hyperactivity disorder (ADHD) is a common comorbid disorder in patients suffering from substance use disorder (SUD). Individuals with co-occurring SUD and ADHD are more likely than SUD patients without ADHD to have developed SUD at a younger age, be polysubstance users, and need inpatient treatment more often. The present study investigates whether individuals with polysubstance use disorder who remain abstinent for a year after entering treatment have a more substantial reduction in ADHD symptoms than those who relapsed and controls.

Material and methods: Subjects were SUD patients (N = 115) and healthy controls (N = 34). ADHD symptoms were assessed using the adult ADHD Self-Report Scale (ASRS). Substance use was assessed by self-reports on the Alcohol Use Disorders Identification Test (AUDIT) and the Drug Use Disorders Identification Test (DUDIT). Participants were defined as having relapsed if they had an AUDIT score ≥ 8 or a DUDIT score ≥ 2 for women and ≥ 6 for men.

Results: Patients who remained abstinent for one year reported a substantial reduction of ADHD symptoms compared to patients who relapsed and controls.

Conclusions: Abstinence alleviates ADHD symptoms among patients with polysubstance use disorder. We suggest that confirmation of an ADHD diagnosis should follow a period of abstinence to avoid identification of false-positive cases.

1. Introduction

One of the most common disorders associated with substance use disorder (SUD) is attention-deficit/hyperactivity disorder (ADHD) (Brook, Whiteman, Cohen, Shapiro, & Balka, 1995; Kessler et al., 2006; Wilens & Spencer, 2010). Nearly 25% of the adults between 18 and 44 years old who have been diagnosed with SUD in the United States have also been diagnosed with ADHD (Kessler et al., 2006). Other studies show that 40% of clinical SUD samples in different countries screened positive for ADHD (Glind et al., 2013; van Emmerik-van Oortmerssen et al., 2012).

ADHD has an adverse effect on the course of SUD (McAweeney, Rogers, Huddleston, Moore, & Gentile, 2009; Wilens et al., 2011). Relative to SUD patients without ADHD, SUD patients with ADHD are more likely to have developed SUD at a younger age, become polysubstance users, and need inpatient treatment more often (Arias et al., 2008; Tamm et al., 2013). Also, SUD patients who screen for a concurrent adult ADHD diagnosis have been shown to have more severe and chronic SUD (Young et al., 2015), and a childhood ADHD diagnosis in SUD patients is associated with higher relapse rates after treatment termination (Carroll & Rounsaville, 1993).

ADHD is manifested in childhood, and it persists into adolescence in

Abbreviations: SUD, substance use disorder; ADHD, attention deficit hyperactivity disorder; ASRS, ADHD Self-Report Scale; AUDIT, Alcohol Use Disorders Identification Test; DUDIT, Drug Use Disorders Identification Test; WASI, Wechsler abbreviated scale of intelligence; GP, general practitioner; REK, Regional Ethical Committee; DSM, Diagnostic and Statistical Manual of Mental Disorders; ANOVA, analysis of variance

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http://dx.doi.org/10.1016/j.abrep.2017.08.005
Received 24 July 2017; Received in revised form 30 August 2017; Accepted 30 August 2017
Available online 04 September 2017

almost 75% of the cases, and into adulthood in close to 50% (Wilens & Spencer, 2010). Most studies have focused on how the onset of ADHD, often in combination with conduct or bipolar disorders, increases the risk of later SUD (Wilens et al., 2011).

Comorbid ADHD place patients with SUD at risk of impaired recovery, with longer duration of substance use and slower remission rate (Wilens, Biederman, & Mick, 1998).

SUD complicates the diagnostic process, particularly for clients identified with ADHD in adulthood and for those with symptoms below the diagnostic threshold (Levin, Evans, & Kleber, 1998). Diagnosing ADHD in adult patients with SUD requires accurate retrospective information, and this is often difficult to obtain because of inadequate anamnestic data (Faraone et al., 2007; Levin et al., 1998). Consequently, there is a group of adults who meet all the criteria for an ADHD diagnosis except age at onset (Faraone et al., 2007). However, studies have found that this group has similar forms of psychiatric comorbidity, neurocognitive impairment, and familial transmission as the group with a confirmed diagnosis, only differing on the childhood onset requirement of the Diagnostic and Statistical Manual of Mental Disorders-Fourth Edition (DSM-IV) (Faraone et al., 2006; Faraone et al., 2006). Furthermore, because SUD often emerges in adolescence, the apparent late onset of ADHD may reflect the onset of SUD rather than ADHD, and although subthreshold ADHD may be a milder form of the disorder (Norén Selinus et al., 2016), it could also reflect nonspecific risk characteristics for SUD rather than symptoms of ADHD (Faraone et al., 2006). Taken together, this means that improvement of SUD symptoms may also lead to an improvement of problems associated with ADHD symptoms.

The present study investigates how 12 months of sobriety following the onset of treatment affects the presence of self-reported ADHD symptoms in a clinical sample of polysubstance users. Polysubstance use disorder is frequent in clinical SUD samples (Andrade, Carroll, & Petry, 2013). Comorbid ADHD place patients with SUD at risk of impaired recovery, with longer duration of substance use and slower remission rate (Wilens et al., 1998).

To our knowledge, this is the first study to report changes in self-reported ADHD symptoms in people with polysubstance use disorder during the 12-month period after initiation of treatment. Using a prospective design and a control group, we addressed the following question: Will individuals with polysubstance use disorder who remain abstinent for one-year show a greater improvement in ADHD symptoms compared with those who relapsed and controls?

2. Material and methods

2.1. Participants

One hundred and fifty SUD patients were recruited from 10 outpatient and residential treatment facilities within the Stavanger University Hospital catchment area (Norway) between March 2012 and May 2013. We employed broad inclusion criteria focusing on polysubstance use disorder because it is common in clinical settings (Badiani, Belin, Epstein, Calu, & Shaham, 2011; Stavro, Pelletier, & Potvin, 2013). The main inclusion criteria at baseline were: (a) evidence of SUD with polysubstance use, operationalized as the use of more than one drug on a single occasion, or a history of abusing multiple drugs; (b) enrolled in a new treatment sequence by the substance use treatment service; and (c) at least 16 years of age. At baseline, 22 patients were excluded because they did not meet the inclusion criteria (four had no substance use addiction and 18 did not report polysubstance use), leaving 128 patients in the study.

The control group (N = 38) was a convenience sample recruited by posters exhibited at social welfare and GP offices. Controls and SUD patients were compensated with NOK 400 (~USD 50) for the baseline testing. During the one-year follow-up period, 13 SUD patients and four people from the control group withdrew or dropped out of the study. The final group included 115 SUD patients and 34 controls. The retention rate was 89.8% for patients and 89.5% for controls. This study was reviewed and approved by the Regional Ethical Committee (REK 2011/1877) and conducted according to its guidelines and those of the Helsinki Declaration (1975). Written informed consent was obtained from all participants.

2.2. Procedures

The study is part of a prospective cohort study of a sample of SUD patients in the Stavanger University Hospital catchment area. To minimize contamination from drug withdrawal and the acute neurotoxic effects of psychoactive substances, baseline assessment was performed after two weeks of abstinence (Miller, 1985) by experienced and trained staff. Information on substance use was assessed using the Alcohol Use Disorders Identification Test (AUDIT) (Bohn, Babor, & Kranzler, 1995) and the Drug Use Disorders Identification Test (DUDIT) (Voluse et al., 2012). At the one-year follow-up, patients were defined as relapsing to a significant level of use if they had an AUDIT score ≥ 8, or a DUDIT score ≥ 2 for women and ≥ 6 for men (Bohn et al., 1995; Voluse et al., 2012).

2.3. Adult ADHD self-report scale (ASRS)

The ASRS is a frequently used screening instrument for ADHD (Kessler et al., 2005). It is composed of 18 items that reflect the symptoms used to define ADHD according to the fifth edition of the Diagnostic and statistical manual of mental disorders (DSM−V) (Association, 2013). The results from this scale assess the presence of ADHD symptoms, but on its own, it is not an adequate diagnostic tool.

Symptoms are rated on a 5-point Likert-type scale (0–4 = never, rarely, sometimes, often, and very often), with a range of 0 to 72 for the 18-item instrument. This instrument has previously been validated in SUD populations (Dakwar et al., 2012; Van de Glind et al., 2013).

In the present study, we included a sum score across all the 18 ASRS items, a sum score for the ASRS items that assess inattention (items 1–4 and 7–11), and a sum score for the items that assess hyperactivity/impulsivity (items 5, 6, and 12–18).

In order to highlight the severity of individual items in the ASRS, we dichotomized responses to the ASRS items into “severe/not severe” according to recommendations by Kessler et al. (Kessler et al., 2005). Lastly, we used the “severe/not severe” dichotomized items to identify clinically significant ASRS profiles. The ASRS profile was dichotomized as “clinically significant” if ≥ 9 items were dichotomized as “severe”, and "not clinically significant if < 9 items were dichotomized as severe". This method is commonly used in clinical practice, and in line with the original recommendations by Kessler et al. (Kessler et al., 2005).

2.4. Statistical analyses

All analyses were performed using IBM SPSS v24 for Mac. Two-tailed p-values < 0.05 were considered statistically significant. Data were assessed for normality with histograms, Q–Q plots, Kolmogorov–Smirnov tests, and Shapiro-Wilk tests. Visual inspection of histograms and Q-Q-plots revealed that ASRS-scores at baseline and 1 year follow up did not deviate from normality. This was also evident from the Kolmogorov-Smirnov test ($D_{(149)} = 0.05$, $p = 0.200$; and 1 year $D_{(149)} = 0.06$, $p = 0.200$, respectively) and Shapiro-Wilk test (baseline $w_{(149)} = 0.99$, $p = 0.651$; and 1 year $w_{(149)} = 0.99$, $p = 0.327$). Sub-analysis of normality for each participant group yielded similar results (data not shown). As the data was normally distributed, parametric statistics were used throughout. The statistical procedures of the demographic variables have been published in a previous paper (Hagen et al., 2017).

Mixed ANOVA was used to compare changes in abstainers,