Research paper

Screening for attention-deficit/hyperactivity disorder in borderline personality disorder

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ABSTRACT

Background: A valid screening instrument is needed to detect attention-deficit/hyperactivity disorder (ADHD) in treatment-seeking borderline personality disorder (BPD) patients.

We aimed to test the performance of the widely-used Adult ADHD Self-Report Scale v1.1 screener (ASRS-v1.1).

Methods: 317 BPD subjects were systematically assessed for comorbid ADHD and completed the ASRS-v1.1. 79 BPD patients also completed the Wender Utah Rating Scale (WURS-25).

Results: The prevalence of adult ADHD was of 32.4%. The overall positive predictive value of the ASRS-v1.1 was of 38.5%, the negative predictive value 77.0%, the sensitivity 72.8%, and the specificity 43.9%. Combining WURS-25 and ASRS-v1.1 improved sensitivity to 81.8% and specificity to 59.6%.

Limitations: Cross-sectional study on treatment-seeking patients.

Conclusions: We found a high prevalence of ADHD using structured interviews. The ASRS-v1.1 was not a sensitive screener for identifying possible ADHD cases in a BPD population, with a high number of false positives. When combined with the WURS-25, it offered improved screening.

1. Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder that persists into adulthood in about two-thirds of individuals (Fayyad et al., 2007; Simon et al., 2009), with an estimated prevalence in adults ranging from 1% to 6% (Fayyad et al., 2007; Kessler et al., 2006; Simon et al., 2009). Adult ADHD has been frequently reported to be comorbid with Borderline Personality Disorder (BPD). In clinical samples of BPD patients, the prevalence of adult ADHD is higher than in the general population, ranging from 16.1% to 38.1% (Asherson et al., 2014; Ferrer et al., 2010; Philipsen et al., 2008; Prada et al., 2014). These high prevalence rates are consistent with the fact that BPD symptoms are more frequent in ADHD adolescents (Burke and Stepp, 2012; Speranza et al., 2011; Stepp et al., 2012). Several studies showed prospectively that ADHD was a risk factor for a subsequent development of BPD (Fischer et al., 2002; Miller et al., 2008; Stepp et al., 2012), with rates of BPD among adults with ADHD ranging from 19% to 37%.

Criterion overlap, i.e. the fact that some symptoms are shared by the two disorders (impulsivity, emotional and affective lability, interpersonal deficits) is not sufficient to explain ADHD and BPD comorbidity (Matthies and Philipsen, 2014). Several hypotheses have been raised to explain this higher-than-chance association: shared genetic and environmental vulnerability (Distel et al., 2011), similar neurobiological dysfunction (Lampe et al., 2007), or ADHD symptoms increasing the chance to live in an invalidating environment during childhood, therefore increasing the chance to develop BPD in adolescence and adulthood (Asherson et al., 2014; Matthies and Philipsen, 2014; Philipsen et al., 2008). Regardless of the reason for the interaction between the disorders, the comorbidity appears to be an important problem. The presence of adult ADHD is associated with more severe symptoms of BPD, more frequent comorbidities, a worse outcome and poor response to treatment (Philipsen et al., 2008; Storebø and Simonsen, 2014). Observational studies nevertheless suggest that treating BPD patients medically for comorbid adult ADHD improved their response to psychotherapy (Prada et al., 2015).

The identification and treatment of ADHD in treatment-seeking BPD patients may therefore improve the overall outcome. The detection of

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ADHD in BPD subjects relies mainly on a clinical evaluation aiming at distinguishing symptoms pertaining to one or the other disorder. It is a difficult task for several reasons. ADHD may not have been diagnosed during childhood, or patients may not remember having been diagnosed. Furthermore, several features of BPD overlap with those of ADHD, including emotional instability and dysregulation (affective lability, hot temper, and stress intolerance) (Skirrow and Asherson, 2013), low self-esteem (Harpin et al., 2016), interpersonal deficits (Perroud et al., 2017), impulsivity (Prada et al., 2014), inner restlessness (Jung et al., 2016), and risk-taking behavior (Fossati et al., 2001). The complexities of symptom overlap and comorbidity create a particular problem for general adult mental health services, to which patients with BPD are often referred, but where experience of the diagnosis and clinical management of ADHD is often lacking. Furthermore, the diagnosis of adult ADHD is rather time-consuming and even if the prevalence of ADHD is high, screening can be cost-effective in terms of identifying patients who are likely to have ADHD in order to better allocate resources. It is therefore useful to have a reliable screening tool for ADHD in BPD patients. Several instruments are available for the screening of adult ADHD (Belendiuk et al., 2007). Some of them are in the public domain and show potential for providing a cost-effective approach for confirming current symptoms of ADHD in BPD patients. However, the usefulness of these tools has not yet been tested.

The 6-item version of the World Health Organization Adult ADHD Self-Report Scale v1.1 (ASRS-v1.1) symptom checklist is a short, freely-accessible and largely-used screening tool.

This version was developed for optimal consistency with the clinical classification. In the seminal study of ASRS-v1.1, a population survey found that the tool had a sensitivity of 68.7%, a specificity of 99.5% and a positive predictive value (PPV) of 89.3% (Kessler et al., 2005) (see Table 1 for description of psychometrics). Furthermore, the ASRS-v1.1 has demonstrated high internal consistency (Adler et al., 2006) and good test-retest reliability (Matza et al., 2011). In a subsequent primary care study with a slightly larger sample (N = 200), Hines et al. (2012) reported high sensitivity (100%) and moderate positive predictive power (52%), suggesting that the ASRS-v1.1 would rarely miss ADHD in an adult with ADHD. This result has been replicated in psychiatric populations, and particularly in comorbid populations, and the screening tool is thought to have high sensitivity, but may lack specificity. In a large study involving patients seeking treatment for substance use disorder, van de Glind et al. (2013) found that the overall PPV of the ASRS-v1.1 was 26%, and its negative predictive value (NPV) was 97%. The sensitivity was good and its specificity was moderate for identifying possible ADHD cases in this population (van de Glind et al., 2013). In another study with cocaine use disorder patients, the NPV was also found to be good (92%), suggesting that ASRS-v1.1 is a useful screener for these patients (Dakwar et al., 2012).

As ADHD comorbidity in BPD patients is now recognized as an important issue, and since ASRS-v1.1 is a widely used and recommended screening tool for ADHD, we suspect that the ASRS-v1.1 is also extensively used in patients with BPD. However, the psychometric properties and relevance of this instrument have not been adequately tested among treatment-seeking BPD patients. Moreover, doubts remain as to how ASRS-v1.1 can identify correctly-diagnosed ADHD patients with BPD. BPD and/or bipolar disorder type II patients scored highly at the ASRS-v1.1 (Edebol et al., 2012), in the range between ADHD patients and control subjects, and ASRS has been shown to have a low specificity in bipolar disorder patients (Perroud et al., 2014).

The purpose of this study was to assess the clinical relevance of the ASRS-v1.1 in detecting comorbid ADHD among a population of out-patients seeking treatment for BPD; ADHD was assessed by means of a clinical interview that included a semi-structured interview for ADHD during childhood and adulthood. ADHD is typically considered as a neurodevelopmental disorder with symptoms present during childhood, even if this statement was recently challenged by prospective epidemiological studies (Agnew-Blais et al., 2016; Caye et al., 2016; Moffitt et al., 2015). We wondered whether the specificity of the ASRS-v1.1 could be improved by using a self-report questionnaire assessing ADHD symptoms during childhood, namely the Wender Utah Rating Scale (WURS-25) which was used in a subset of patients (Ginsberg et al., 2010; Rao and Place, 2011).

2. Methods

2.1. Participants and procedure

317 French-speaking patients suffering from BPD were recruited in a specialized center for diagnosis and outpatient treatment of adults suffering from ADHD or BPD at the University Hospitals of Geneva. Patients were recruited between 2013 and 2016

Patients underwent a clinical evaluation conducted by a trained psychiatrist, to ascertain the diagnosis of BPD and/or ADHD according to DSM-IV criteria, and to exclude any organic condition and/or Axis I disorders that might better explain the disorder.

After providing informed consent, subjects were administered screening instruments (ASRS 1.1 for all subjects, and WURS-25 for a subset of 79 patients), followed by structured diagnostic interviews conducted by trained psychologists. BPD diagnosis was further assessed by the Screening Interview for Axis II disorders (SCID-II) (First and Gibbon, 2004) and other diagnoses, particularly child and adult ADHD by the Diagnostic Interview for Genetic Studies (DIGS) (Nurnberger et al., 1994). A best estimate procedure including the data from the clinical evaluation and from the semi-structured interviews was used to confirm BPD and/or ADHD. Patient were classified as "childhood ADHD" if the symptoms of ADHD were noted during childhood, but not present in adulthood according to DSM-IV criteria, and "adult ADHD" if symptoms of ADHD persisted in adulthood.

The study was approved by the ethics committee of University Hospitals of Geneva.

2.2. Assessment instruments

2.2.1. Adult ADHD Self-Report Scale-Version 1.1

The 6-item ASRS-v1.1 screener (Kessler et al., 2005) was designed to help screen for ADHD in adults (aged 18 and older). The scale consists of 6 items, each of which can be scaled from 0 to 4 (0 = never; 1 = rarely; 2 = sometimes; 3 = often; 4 = very often). The six questions of the ASRS-v1.1 are consistent with the DSM-IV criteria and address the manifestation of ADHD in adults, with the first four questions relating to inattention, and the two last ones relating to hyperactivity. One point

Table 1
Definitions of psychometrics calculated in this study.

sensitivity	Probability of positive screener given disease present = true positive rate
specificity	Probability of negative screener given disease not present = true negative rate
PPV Positive Predictive Value	Probability that disease is present given positive screener
NPV Negative Predictive Value	Probability that disease is absent given negative screener
LR+ Positive Likelihood Ratio	True positive rate/false positive rate (sensitivity/(1-specificity))
LR- Negative Likelihood Ratio	False negative rate/true negative rate ((1-sensitivity)/specificity)