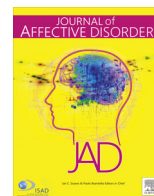




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Journal of Affective Disorders

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Research paper

## Delineating ADHD and bipolar disorder: A comparison of clinical profiles in adult women



Glenn L. Kitsune<sup>a</sup>, Jonna Kuntsi<sup>b</sup>, Helen Costello<sup>b</sup>, Sophia Frangou<sup>c</sup>, Georgina M. Hosang<sup>d</sup>, Gráinne McLoughlin<sup>b</sup>, Philip Asherson<sup>b,\*</sup>

<sup>a</sup> King's College London, Department of Psychological Medicine, Institute of Psychiatry, Psychology and Neuroscience (IOPPN), London, UK

<sup>b</sup> King's College London, MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, Psychology and Neuroscience (IOPPN), London, UK

<sup>c</sup> Clinical Neurosciences Studies Center, Department of Psychiatry, Icahn School of Medicine at Mount Sinai, New York, United States

<sup>d</sup> Department of Psychology, Goldsmiths, University of London, London, UK

### ARTICLE INFO

#### Article history:

Received 4 June 2015

Received in revised form

30 November 2015

Accepted 20 December 2015

Available online 23 December 2015

#### Keywords:

Adults

Attention/deficit Hyperactivity-disorder

Bipolar disorder

Diagnostic errors

Mood disorders

### ABSTRACT

**Objective:** Overlapping symptoms can make the diagnostic differentiation of attention-deficit/hyperactivity disorder (ADHD) and bipolar disorder (BD) challenging in adults using current clinical assessments. This study sought to determine if current clinical measures delineate ADHD from BD in adults, comparing relative levels of ADHD, BD and emotional lability (EL) symptoms.

**Methods:** Sixty adult women with ADHD, BD or controls were compared on self-report and interview measures for ADHD symptoms, mania, depression, EL, and impairment.

**Results:** ADHD interview measures and self-ratings of ADHD symptoms best discriminated between ADHD and BD. Self-report measures of EL and depression showed non-specific enhancement in both clinical groups. BD-specific items may distinguish BD from ADHD if a retrospective time-frame is adopted.

**Conclusions:** Using measures which capture specific symptoms of ADHD and chronicity/episodicity of symptoms facilitates the delineation of ADHD from BD in adult women.

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### 1. Introduction

The diagnostic differentiation of attention-deficit/hyperactivity disorder (ADHD) from bipolar disorder (BD) is important for the correct treatment and management of both conditions (Asherson et al., 2014; Atmaca et al., 2009; Galanter et al., 2005; Mosholder et al., 2009). Yet, similarities in symptoms such as restlessness, increased production of speech and distractibility in both conditions and evidence of persistent impulsive behaviours in euthymic BD (Najt et al., 2007; Peluso et al., 2007) can make differentiation of the two conditions challenging (Galanter and Leibenluft, 2008; Kent and Craddock, 2003). The emerging evidence indicating high levels of emotional lability (EL) in ADHD (Barkley and Fischer, 2010; Skirrow et al., 2014, 2012; Surman et al., 2013), independent of comorbidity (Skirrow and Asherson, 2013), and the recognition of EL as an associated feature of ADHD (American Psychiatric Association, 2013), further complicate the diagnostic boundaries between ADHD and BD. In BD equivalent prevalence rates are

observed in both men and women (Diflorio and Jones, 2010), while the ratio of males to females diagnosed with ADHD is 1.6:1 (Willcutt, 2012), with indications that ADHD persistence and patterns of comorbidity are similar in both genders (Biederman et al., 2011, 2012). However, it is acknowledged that there remains a lack of research into ADHD in females, particularly among adults (American Psychiatric Association, 2013).

Meta-analysis examining comorbidity of ADHD and BD in adults identified rates ranging from 5% to 47% (Wingo and Ghaemi, 2007), and studies of familial co-variation indicate that the disorders co-occur at a higher rate than in the general population, suggesting a potential familial relationship between them (Larsson et al., 2013; Skirrow et al., 2012). The existence of juvenile bipolar disorder, now reconceptualised as severe mood dysregulation in DSM-5, and its overlap with ADHD has been hotly debated (Kent and Craddock, 2003; Skirrow et al., 2012). Yet, despite clearer diagnostic conceptualisations in adults, there are few studies comparing the extent to which symptoms are similar or different between ADHD and BD, and address the challenges of delineation in adult populations. The few direct comparisons to date have used self-report measures of ADHD and depression symptoms, which may have limited scope in their potential to delineate the two disorders (Ibanez et al., 2012; Torralva et al., 2011). The

\* Correspondence to: King's College London, MRC Social, Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, London, UK.

E-mail address: [philip.asherson@kcl.ac.uk](mailto:philip.asherson@kcl.ac.uk) (P. Asherson).

comparative degree and specificity of EL within each disorder is also an important question to clarify, as mood fluctuations are seen as a characteristic feature of BD, and could result in the misdiagnosis of adults with ADHD and high EL.

### 1.1. Aims of the study

The aims were to determine the potential of current clinical measures to delineate ADHD from BD in adults, comparing relative levels of ADHD, BD and EL symptoms across the two disorders. Based on previous studies in men with ADHD we hypothesised that EL frequently occurs in women with ADHD and for this reason cross-sectional measures of EL will not distinguish between ADHD and BD. We further hypothesise that women with ADHD will present with a significant number of ‘mania’ symptoms due to the overlap in symptom criteria. We propose that the key distinction to be made will be based on episodicity versus chronicity of the symptoms and which might not be easy to determine based on cross-sectional data alone.

## 2. Methods and materials

### 2.1. Sample

Participants with BD were recruited from a largely female sample that had previously participated in another research study (Hosang et al., 2012) and the Maudsley Psychosis Clinic. In ADHD, population studies have not reported gender differences in clinical-range symptoms (Das et al., 2012; de Zwaan et al., 2012), although there remains a relatively limited amount of data collected with adult female participants with ADHD. To address this need, and for purposes of sample matching with the BD group, we recruited an all-female sample in this study. Women with ADHD were therefore recruited from the National Adult ADHD Clinic at the Maudsley Hospital. Control participants were recruited from the Mindsearch volunteer database maintained by the Institute of Psychiatry, Psychology and Neuroscience, which comprises several thousand potential participants. Participants were randomly selected from all those meeting recruitment criteria for this study (described below). In total 60 adult women were recruited (20 with ADHD, 20 with BD and 20 control participants). The study received ethical approval by the Camberwell St Giles Research Ethics Committee (Ref: 11/LO/0438) and was conducted according to the Declaration of Helsinki. All participants provided informed content.

### 2.2. Diagnosis and recruitment

Fifty-seven women with ADHD, 75 women with BD, and 120 control women matching requirements of age, gender and clinical diagnosis based upon DSM-IV criteria were approached to participate. The ADHD participants met current criteria for combined-type ADHD or inattentive-type ADHD with sufficient past reported symptoms of hyperactivity–impulsivity to have met combined-type criteria during childhood. Participants in the BD group had a diagnosis of Bipolar I Disorder (BD-I) with evidence of a past manic episode lasting one week or more. Eligibility to participate was ascertained by checking medical records for details of diagnosis and psychiatric history, with BD participants recruited via the BADGE study having an additional confirmation of diagnosis using The Schedules for Clinical Assessment in Neuropsychiatry, Version 2.1 [SCAN] (Wing et al., 1990). Exclusions for all groups were drug or alcohol dependency in the last six months, autism, epilepsy, neurological disorders, brain injury, past ECT treatment, current involvement in another research trial likely to alter symptomatology,

**Table 1**  
Number of participants recruited and reasons for exclusion.

|   | ADHD      | BD        | Control    |
|---|-----------|-----------|------------|
| <b>Number approached</b>                | <b>57</b> | <b>75</b> | <b>120</b> |
| <b>Recruitment</b>                      |           |           |            |
| Un-contactable                          | 17        | 26        | 45         |
| Declined                                | 4         | 15        | 25         |
| Travel or childcare difficulties        | 5         | 4         | 5          |
| Did not attend or cancelled             | 1         | 1         | 13         |
| <b>Exclusions</b>                       |           |           |            |
| Unsuitable diagnosis                    | 3         | 7         |            |
| ADHD with comorbid BD                   | 4         |           |            |
| Control with psychiatric disorder       |           |           | 8          |
| Medical or neurological disorder        | 1         |           | 3          |
| Autism                                  | 1         |           |            |
| Past ECT treatment                      |           | 1         |            |
| Participating in another research trial | 1         |           |            |
| Currently pregnant                      |           |           | 1          |
| Insufficient English language ability   |           | 1         |            |
| <b>Final Sample</b>                     | <b>20</b> | <b>20</b> | <b>20</b>  |

Abbreviations: attention-deficit/hyperactivity disorder (ADHD), Bipolar Disorder (BD), Electroconvulsive therapy (ECT). An “unsuitable diagnosis” was a diagnosis of BD-II (i.e. without a manic episode) in the BD group, or an inattentive-subtype ADHD diagnosis with no evidence of symptoms of hyperactivity in childhood.

pregnancy or a limited proficiency in English language. Those with a reported diagnosed comorbidity of both ADHD and BD at screening, those currently experiencing a manic episode, or any ADHD participants with a history of manic or hypo-manic episodes were excluded. Other comorbidities in the clinical groups were permitted. This included one participant with comorbid Depression and one with Obsessive Compulsive Disorder (OCD) in the ADHD group, and one participant with comorbid Anxiety Disorder and one with Borderline Personality Disorder (BPD) in the BD group. All primary analyses were later re-run after excluding these individuals, to check for the influence of these comorbidities on results. Control participants reporting a history of psychiatric disorders or currently taking medication at screening were excluded. Recruitment continued until 20 participants were recruited for each group, as this was calculated to provide 80–90% power to detect a large effect size (0.8) (Table 1). Samples were age-matched at a group level during recruitment. ADHD participants were asked to stop stimulant medication 48-h before research assessments. For ethical reasons, BD participants were not asked to stop taking mood-stabilisers or any anti-psychotic medication they had been prescribed. All participants were asked to refrain from caffeinated drinks and nicotine for two hours prior to the assessment session.

### 2.3. Procedure

Participants attended a single research session to complete self-report measures and clinical interviews alongside other research evaluations. All participants completed the same set of assessments. For informant ratings, participants were given a questionnaire to take home in a stamped address envelope, for a family member or close friend to complete. Interview ratings were conducted by an experienced researcher (GK), trained by a consultant psychiatrist (PA) with experience of both ADHD and BD.

### 2.4. Measures

#### 2.4.1. ADHD symptoms

Measures of ADHD symptoms were obtained using the 18-item Barkley Adult ADHD Rating Scale (BAARS-IV) (Barkley and Murphy, 2006), which consists of the DSM-IV items related to inattention and hyperactivity–impulsivity. Respondents indicated how frequently they experienced behaviours on a scale of 0–3 (never or

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