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Everyday functional ability across different phases of bipolar disorder

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ABSTRACT

Bipolar Disorder (BD) is a chronic illness characterized by significant neurocognitive impairment and functional deficits. Functional status is typically assessed with self-report or observer ratings restricted by poor participant insight and subjective judgment, while application of performance-based measures has been limited. We assessed functional ability in manic, depressed, and euthymic BD individuals using the UCSD Performance-Based Skills Assessment (UPSA-2), which simulates real-world tasks such as medication management. UPSA-2 was administered to 17 manic or hypomanic BD, 14 depressed BD, 23 euthymic BD, and 28 healthy comparison (HC) participants matched for age, education, and IQ. Psychopathology was quantified with the Young Mania Rating Scale (YMRS), Hamilton Depression Rating Scale (HDRS), and the Positive and Negative Syndrome Scale (PANSS); executive functioning was assessed with the Wisconsin Card Sorting Task (WCST). All BD groups exhibited functional ability deficits on the UPSA-2 and impaired performance on the WCST compared to HC. UPSA-2 scores were lower in manic/hypomanic subjects relative to other BD participants and mania symptoms correlated with functional impairment. Poor WCST performance was also associated with worse UPSA-2 function. In summary, BD functional deficits occur across different phases of the disorder and may be impacted by symptom severity and associated with executive dysfunction.

1. Introduction

Bipolar Disorder (BD) represents one of the leading causes of disability worldwide (The World Health Organization, 2001), creating a substantial economic burden driven by expensive medical care and lost productivity (Laxman et al., 2008). While BD was once primarily viewed as an episodic disorder with substantial recovery during remission, mounting evidence indicates people with this illness exhibit a poor prognosis distinguished by enduring cognitive impairment and functional decline (Martinez-Aran et al., 2007; Goodwin et al., 2008). Recent studies have found that over half of BD individuals experience persistent unemployment while 40% self-report impairment in social, cognitive, work, or household functioning (Tohen et al., 2000; Huxley and Baldessarini, 2007; Shippee et al., 2011). Prominent neurocognitive deficits in domains such as executive function persist during manic, hypomanic, and euthymic states (Bearden et al., 2001; Quraishi and Frangou, 2002; Savitz et al., 2005; Bora et al., 2009) and are predictive of disability in social relationships and vocational success (Wingo et al., 2009). Although standard neuropsychological tests remain the primary gauge of BD cognitive deficits, these measures are restricted by limited applicability to real-world functioning (O'Shea et al., 2010). While impaired everyday function has been reported across all phases of BD, most studies have used subjective and imprecise measures such as the Global Assessment of Functioning Scale (GAF) and/or relied on self-report and survey tools that do not control for demographic or socioeconomic factors (Sanchez-Moreno et al., 2009; Martino et al., 2011; Torres et al., 2011). Application of these techniques is particularly challenging for BD, where self-appraisal of functional status may be significantly biased by affective symptoms such as manic grandiosity or low self-esteem in depression.

Recent initiatives such as the Measurement and Treatment Research to Improve Cognition in Schizophrenia (MATRICS) have emphasized the need to utilize objective, performance-based measures of treatment outcome, rather than the traditional reliance on reducing acute symptoms and improving standardized neuropsychological performance (Green et al., 2008). Over the past decade, a series of studies have quantified functional ability in schizophrenia using the UCSD Performance-Based Skills Assessment (UPSA) (Patterson et al., 2001a), a battery of performance tests designed to objectively assess everyday functioning across 5 domains representing real-life activities. A more recent version of the task, the UPSA-2 (Patterson and Goldman, 2005), quantifies functional ability across 6 domains, including (1) planning

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recreational activities, (2) finance, (3) communication skills, (4) transportation, (5) household skills, and (6) medication management. The UPSA is characterized by strong inter-rater and test–retest reliability (Patterson et al., 2001a; Patterson et al., 2001b; Leifker et al., 2010; Light et al., 2012), is highly correlated with neuropsychological deficits, and predicts real-life outcomes such as unemployment status, social and communication skills, and living independence (Twamley et al., 2002; Bowie et al., 2006; Mausbach et al., 2008; Bowie et al., 2010). Although initially designed to determine functional deficits in geriatric psychosis, the UPSA has also been administered successfully to younger cohorts (Heinrichs et al., 2006; Pietrzak et al., 2009), Swedish and Latino samples (Patterson et al., 2005; Harvey et al., 2009), drug-dependent individuals (Henry et al., 2010) and participants with Alzheimer's disease (Goldberg et al., 2010). It has been favorably compared to other measures of functional capacity and selected as the optimal marker of functional assessment by the MATRICS project (Moore et al., 2007; Green et al., 2011; Keefe et al., 2011).

In contrast to the extensive body of literature describing performance-based functional deficits in schizophrenia, relatively few reports have assessed similar measures in BD (McIntosh et al., 2011). Previous work indicates impaired functional performance in older BD patients (mean age 60–73 years), including a correlation between self-care and cognitive deficits in a direct observational study (Gildengers et al., 2007), impaired UPSA performance in a community-dwelling BD sample (Depp et al., 2009), and worse medication management ability (Depp et al., 2008). Other reports have used the brief version of the UPSA (UPSA-B), which tests everyday functioning in only two domains (finance and communication), to demonstrate that this performance-based measure predicts residential independence and work skills in both BD and schizophrenia (Bowie et al., 2010; Mausbach et al., 2010). However, functional ability has not been explicitly examined in different phases of BD using this performance-based measure, as existing studies have been conducted in euthymic individuals or did not specify participant mood state (Depp et al., 2009; Bowie et al., 2010). In addition, while variants of the UPSA task have been administered to BD subjects, the full version of the battery has not been assessed in younger individuals. Thus, more work is required to determine the extent to which objectively quantified functional impairment represents a state- vs. trait-based phenomenon in this disorder, similar to existing reports of persistent neurocognitive deficits (Bora et al., 2009). Performance-based assessment of functional capacity during various illness states would serve as a useful adjunct to self-report data and improve the ability of the clinician to determine if BD patients are capable of functioning independently in the community.

The purpose of the current study was to assess everyday functional ability in manic, depressed, and euthymic adult BD subjects (mean age 34–39 years) using the UPSA-2 task. Previous work suggests that BD cognitive deficits and disability are most pronounced during affective episodes, but also persist during remission (Rosa et al., 2010). Therefore, we hypothesized that BD participants across all phases would exhibit functional deficits relative to healthy comparison subjects, but individuals in a manic or hypomanic state will exhibit the most pronounced functional impairment. We also administered the Wisconsin Card Sorting Task (WCST) as a neuropsychological measure of executive function. Given that impaired WCST performance in schizophrenia is associated with lower UPSA scores (Kurtz and Wexler, 2006), we hypothesized a similar association among BD subjects independent of the phase of their illness.

2. Methods

2.1. Participants

Fifty four participants between the age of 18 and 60 who met SCID (Structured Clinical Interview for DSM-IV) criteria for BD were recruited from inpatient and outpatient psychiatric clinics located at the University of California San Diego (UCSD) Medical Center. We compared three groups of BD participants, including manic ($n=17$), depressed ($n=14$), and euthymic ($n=23$) patients. Euthymic individuals did not meet criteria for current mania or depression, scored 12 or lower on the Young Mania Rating Scale (YMRS) and under 10 on the Hamilton

Table 1
Description of demographic factors and clinical variables for healthy comparison (HC) ($n=28$), euthymic bipolar (BD) ($n=23$), manic/hypomanic BD ($n=17$), and depressed BD subjects ($n=14$). Premorbid IQ was quantified with the Peabody Picture Vocabulary Test (PPVT) and psychiatric symptoms assessed with the Young Manic Rating Scale (YMRS), Hamilton Depression Rating Scale (HDRS), and the Positive and Negative Syndrome Scale (PANSS). Data are shown as the means ± standard deviation. Significant differences between individual groups are denoted as follows; [A]HC and euthymic BD; [B]HC and manic BD; [C]HC and depressed BD; [D]euthymic and manic BD; [E]euthymic and depressed BD; [F]manic and depressed BD. ([a,b,c,d,e,f]$P<0.05$; [A,B,C,D,E,F]$P<0.01$).

Parameter	HC	Euthymic BD	Manic/hypo BD	Depressed BD	Group differences
Age (years)	34.9 ± 11.3	39.2 ± 8.7	33.8 ± 11.4	34.4 ± 8.7	ns
Gender (male/female)	11 M, 17 F	8 M, 15 F	13 M, 4 F	6 M, 8 F	[b,D]
Education (years)	14.4 ± 2.0	15.0 ± 2.3	13.8 ± 2.0	13.8 ± 1.8	ns
Ethnicity (*n*)					ns
Caucasian	17	13	16	10	
Latino	4	2	0	1	
African-American	5	8	1	3	
Asian	2	0	0	0	
BD duration of illness		10.8 ± 8.1	10.7 ± 7.6	9.1 ± 8.6	ns
BD age of onset		28.5 ± 9.1	22.5 ± 6.9	25.4 ± 9.3	ns
Number of BD hospitalizations		2.5 ± 3.0	3.2 ± 2.7	3.6 ± 4.4	ns
Medication					
Antipsychotic alone		8	3	2	
Mood stabilizer alone		9	3	5	
Antipsychotic+mood stabilizer		4	7	5	
Other medications		2	2	0	
Not medicated		0	2	2	
PPVT	102.8 ± 11.8	98.3 ± 13.0	101.0 ± 17.3	104.3 ± 14.4	ns
YMRS	0.7 ± 1.5	5.8 ± 4.0	25.7 ± 8.7	6.7 ± 4.1	[A,B,C,D,F]
HDRS	1.9 ± 2.1	5.6 ± 2.7	9.9 ± 5.2	20.1 ± 6.2	[A,B,C,d,E,F]
PANSS Total Score	33.0 ± 2.9	45.3 ± 9.0[†]	77.0 ± 27.0	64.1 ± 18.9	[B,C,D,E]
PANSS Positive Symptoms	7.9 ± 1.2	11.0 ± 2.4	21.8 ± 8.3	12.3 ± 3.8	[B,c,D,F]
PANSS Negative Symptoms	7.8 ± 1.0	8.0 ± 1.0	14.3 ± 6.6	12.4 ± 6.6	[B,C,D,e]

[†] Indicates a trend toward a difference between the labeled BD group and HC ($P<0.1$).