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Research report

Clinical features associated with trait-impulsiveness in euthymic bipolar disorder patients

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ABSTRACT

Background: A strong association has been reported between trait-impulsiveness and bipolar disorder (BD). Much attention has been focused on this association, but subgroup analysis has generated conflicting results, raising questions about the role of trait-impulsiveness in suicidal behavior and substance misuse in bipolar patients.

Method: We compared Barratt Impulsiveness Scale-10 scores between 385 euthymic bipolar patients and 185 healthy controls. We then investigated possible association between impulsiveness scores and the following clinical characteristics: suicide attempt (SA), lifetime alcohol/cannabis misuse, rapid cycling and mixed episodes.

Results: Bipolar patients and healthy controls had significantly different BIS-10 total score and subscores (motor, attentional and nonplanning impulsiveness) (all p values <0.0001). No association was observed between BIS-10 total score, personal history of SA, number of SA, age at first SA and history of violent SA. Higher BIS-10 total scores were associated with alcohol misuse ($p=0.005$), cannabis misuse ($p<0.0001$), with an additive effect for these two substances ($p=0.005$). Higher BIS-10 total scores were also associated with rapid cycling ($p=0.006$) and history of mixed episodes ($p=0.002$), with an additive effect of these two variables ($p=0.0006$).

Limitations: We used only one clinical measurement of impulsiveness and did not carry out cognitive assessment.

Conclusion: This study demonstrates that trait-impulsiveness may be considered as a dimensional feature associated with BD and with a more severe clinical expression of the disease, characterized by a history of substance misuse, rapid cycling and mixed episodes. We found no association between impulsiveness and SA characteristics in bipolar patients, confirming some previous negative results.

1. Introduction

Impulsiveness can be defined as an uncontrolled tendency to engage in abrupt actions for gratification or pleasure, or as a predisposition toward unplanned reactions to internal or external stimuli, without regard to their negative consequences. Impulsiveness has also been conceptualized as a cognitive dimension reflecting a lack of planning and a lack of concern about future behavior. Impulsiveness can be measured directly by dimensional assessment methods (the Barratt Impulsiveness Scale in particular) and neuropsychological tools (such as the Immediate Memory Task-Delayed Memory Task). The contribution of impulsiveness to bipolar disorder (BD) and its clinical expression remains a matter of debate (Henry and Etain, 2010; Najt et al., 2007). Previous studies have investigated impulsiveness during various states of the disorder. We focus here on studies based on trait dimensional assessment with the Barratt Impulsiveness Scale-11 during euthymic periods of bipolar disorder.

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Table 1
Studies assessing impulsiveness based on the BIS, in euthymic bipolar disease (BD) patients and healthy controls (HC).

Reference	Sample (BD/HC)	Euthymia	Scale	BIS total score (sub)group of euthymic *versus* HC
Ekinci et al. (2011)	71/50 (type 1)	yes	BIS-11	$p<0.001$
Gilbert et al. (2011a,b)	23/23 (adolescents)	15 euthymic 8 current mood episode	BIS-11	$p<0.01$
Kathleen Holmes et al. (2009)	55/25	24/55 BP in remission	BIS	$p<0.0001$ for 3 subscores
Lewis et al. (2009)	106/106	36 in remission 25 subsyndromal, 45 syndromal	BIS-11	no difference
Matsuo et al. (2010)	20/27 (female patients only)	mean HAM-D about 15	BIS-11	not mentioned *per se*
Peluso et al. 2007	36/51	12 euthymic BP 24 depressed	BIS	$p<0.05$
Perroud et al. 2011	138/143	yes (before hospital discharge)	BIS-10	$p<0.0001$
Swann et al. (2001)	10/12	yes	BIS-11	$p<0.0001$
Swann et al. (2003)	22/35	yes	BIS	$p<0.001$
Swann et al. (2004)	45/37	30 interepisode 15 manic	BIS-11	$p<0.01$
Swann et al. (2009)	114/71	29 euthymic 19 hypomanic, 33 depressed 25 combined symptoms	BIS-11	$p<0.001$
Swann, 2010	85/78 61 BD 24 BD patients with antisocial personality disorder	24 euthymic 18 manic/hypomanic, 25 depressed 19 combined symptoms	BIS-11	$p<0.0001$ no difference across mood states (no adjustment)
Strakowski et al. (2010)	31/48	Yes (31 euthymic patients from a sample of 108)	BIS-11	$p=0.007$
Median number of euthymic BP *versus* HC (Matsuo not included) 26.5 *versus* 48 and range (10–138) *versus* range (12–148)				

The results reported for trait impulsiveness assessments with the Barratt Impulsiveness Scale in euthymic bipolar patients (see Table 1), are remarkably similar across studies, with higher scores for euthymic bipolar patients than for controls (Ekinci et al., 2011; Gilbert et al., 2011b; Kathleen Holmes et al., 2009; Matsuo et al., 2010; Peluso et al., 2007; Perroud et al., 2011; Strakowski et al., 2010; Swann et al., 2001, 2003, 2004, 2009, 2010), except in one study (Lewis et al., 2009). Trait-impulsiveness has thus been identified as a potential dimensional marker of bipolar disorder. However, these studies had very small sample sizes, with a median of only 26.5 euthymic bipolar patients (range 10–138) and 48 healthy controls (range 12–148) included. This is a major limitation, because sample sizes have, in most cases, been too small for detailed subgroup analyses that might reveal associations with candidate clinical characteristics, such as suicidal behavior and substance misuse, in bipolar patients.

Several studies have provided evidence for an association between trait-impulsiveness and suicide attempts (SAs) in patients with bipolar disorder (Ekinci et al., 2011; Gilbert et al., 2011a; Grunebaum et al., 2006; Oquendo et al., 2004; Swann et al., 2009). Moreover, Maser argued, based on the results of a 14-year prospective study (Maser et al., 2002), that impulsiveness is one of the best predictors of completed suicide beyond 12 months in patients with affective disorders engaging in lethal or near-lethal suicidal behavior. However, the findings of other studies (Michaelis et al., 2004; Oquendo et al., 2000; Perroud et al., 2011; Swann et al., 2005) did not support such an association. Indeed, previous studies on this topic have been subject to several limitations. First, many of the studies giving positive results were conducted on samples of bipolar patients highly heterogeneous in terms of current mood state (including euthymic, depressed, (hypo)manic and mixed patients), potentially giving rise to false-positive results due to the contaminating effects of current symptoms. Indeed, the available findings suggest that impulsiveness is not only a trait component of bipolar disorders, but also state-related. State-impulsiveness appears to be differently related to depressive, mixed and manic episodes, with high levels of motor impulsiveness thought to be specific to manic episodes and non-planning impulsiveness thought to be specific to major depressive episodes (Swann et al., 2008). However, these studies also had small sample sizes (median=67; range 44–138) and the possibility of false-negative results due to a lack of power cannot be ruled out. In particular, the largest study giving negative results ($n=138$) was conducted on a sample of euthymic patients (Perroud et al., 2011). Given these limitations, the reported association between trait impulsiveness and suicide attempts in bipolar patients remains controversial.

It is widely accepted that impulsiveness and substance abuse are associated in BD (Frye and Salloum, 2006), but very few data supporting this association have been published (Swann, 2010). Swann et al. (Swann et al., 2004) investigated comorbidity between bipolar disorder and substance misuse by comparing impulsiveness as a stable trait in interepisode bipolar and non bipolar subjects with and without substance abuse. They then compared impulsiveness in interepisode and manic bipolar subjects with and without substance abuse. They found an additive increase in trait impulsiveness in subjects with bipolar disorder and substance abuse. BIS-11 scores have also been reported to be higher in bipolar patients with substance misuse disorders than in patients without such disorders (Swann et al., 2010). Bipolar patients with behavioral addictions also seem to be more impulsive (Di Nicola et al., 2010), but the evidence for this association remains weak and further confirmation is required.

Several other clinical characteristics of bipolar patients, such as pathological picking of the skin, compulsive buying, intermittent explosive disorder, trichotillomania (Karakus and Tamam, 2011), predominant depressive polarity (Ekinci et al., 2011), rapid cycling (Gilbert et al., 2011b), early onset (Swann et al., 2009) and comorbid anxiety disorder (Taylor et al., 2008) have been associated with impulsiveness. Further studies of large samples of euthymic bipolar patients and healthy controls are required to unravel the contribution of impulsiveness to bipolar disorder and disease severity.

In order to test the relevance of impulsivity as a potential intermediate phenotype in euthymic bipolar patients, our primary aim was to study trait-impulsiveness in a large population of euthymic bipolar disorder patients and healthy subjects. Our secondary aim was to clarify further whether trait-impulsiveness