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Research report

Affect intensity measure in bipolar disorders: A multidimensional approach



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ABSTRACT

Background: Emotional dysregulation, characterized by high levels of both arousal and intensity of emotional responses, is a core feature of bipolar disorders (BDs). In non-clinical populations, the 40-item Affect Intensity Measure (AIM) can be used to assess the different dimensions of emotional reactivity. **Methods:** We analyzed the factor structure of the AIM in a sample of 310 euthymic patients with BD using Principal Component Analysis and examined associations between AIM sub-scale scores and demographic and illness characteristics.

Results: The French translation of the AIM demonstrated good reliability. A four-factor solution similar to that reported in non-clinical samples (Positive Affectivity, Unpeacefulness [lack of Serenity], Negative Reactivity, Negative Intensity), explained 47% of the total variance. Age and gender were associated with Unpeacefulness and Negative reactivity respectively. 'Unpeacefulness' was also positively associated with psychotic symptoms at onset ($p=0.0006$), but negatively associated with co-morbid substance misuse ($p=0.008$). Negative Intensity was positively associated with social phobia ($p=0.0005$).

Limitations: We cannot definitively exclude a lack of statistical power to classify all AIM items. Euthymia was carefully defined, but a degree of 'contamination' of the self-reported levels of emotion reactivity may occur because of subsyndromal BD symptoms. It was not feasible to control for the possible impact of on-going treatments.

Conclusions: The AIM scale appears to be a useful measure of emotional reactivity and intensity in a clinical sample of patients with BD, suggesting it can be used in addition to other markers of BD characteristics and sub-types.

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1. Introduction

Individuals with BD experience a wide range of emotional disturbances including mood symptoms, emotional lability and reactivity, irritability, anxiety and anger, suggesting the existence of

inappropriate or inadequate emotion regulation during acute illness and inter-episode phases (Henry et al., 2007, 2008; M'Bailara et al., 2009). Regulation of emotions in BD has been described as altered, both in terms of higher levels of arousal (being emotionally alert or reactive to a stimulus) and hyper-intensity (characterized by an excessive level of a specific emotional reaction) whatever the valence (positive/negative) (M'Bailara et al., 2009). Furthermore, individuals with BD experience this emotional dysregulation in their everyday lives, even during euthymia. Abnormal mood reactivity is observed in studies using the experience sampling method,

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and also for a range of other emotions in response to daily stressors (Myin-Germeys et al., 2003; Havermans et al., 2010). Hypersensitivity to emotional stimuli and higher arousal in patients with BD compared to healthy controls has been demonstrated in various laboratory studies including those assessing exposure to images and films with different emotional valences, autonomic nervous system responses, affective go/no go tasks and/or Emotional Stroop paradigms (Phillips et al., 2003; Houenou et al., 2012; Kerr et al., 2005; Larsen et al., 1987; M'Bailara et al., 2009; Henry et al., 2012).

A problem in investigating these issues is that the complex emotional paradigms used in research (such as standardized emotional induction experiments) are difficult to apply in clinical settings (M'Bailara et al., 2009). An alternative that is more suitable for day-to-day practice is the use of self-report measures, but first it must be demonstrated that these tools are applicable to clinical as well as non-clinical samples (Marwaha et al., 2013). One of the best known measures of emotional reactivity is the Affect Intensity Measure scale (Larsen et al., 1986). Scores on this questionnaire correlate significantly with self-reported daily mood ratings over several months as well as various peripheral measures of physiological arousal (Larsen et al., 1986).

It is suggested that the AIM can discriminate more precisely between sub-components of emotional response (Diener et al., 1985a). Initially, Diener, Larsen and colleagues (Larsen et al., 1986; Diener et al., 1985b) proposed the use of a uni-dimensional version of the AIM as a high level of internal consistency was observed in several independent samples of young people. However, further non-clinical studies (including general population and student samples) indicated a four-factor solution for the structure of the AIM, with two positive sub-scale scores (positive affectivity, serenity) and two negative sub-scale scores (negative intensity; negative reactivity). By investigating the goodness-of-fit of various factorial structures of the AIM, two other studies concluded that the most parsimonious model was a three-factor structure with one positive factor (reactivity/intensity) and two negative factors (intensity; reactivity) (Bryant et al., 1996; Simonsson-Sarnecki et al., 2000; Weinfurt et al., 1994; Williams, 1989; Rubin et al., 2008, 2012). Even if the factorial structure is not fully elucidated, these analyses consistently indicated that the AIM may be a relevant tool to discriminate more precise characteristics of emotions such as reactivity and intensity, both for positive and negative emotional valences. However, all the studies described were performed in non-clinical samples, usually student populations, and as yet, the only study of BD used the uni-dimensional version of the AIM and did not examine any sub-scale scores (Henry et al., 2008).

In a previous study by our research group (Henry et al., 2008), we showed that euthymic BD cases exhibited higher levels of emotional response to daily life stimuli compared to healthy controls (as assessed using the AIM total score) and also suggested that affective intensity may represent a core dimension of BD even when clinical cases are not experiencing an acute illness episode. Also, a high level of emotional intensity was associated with lifetime comorbid psychiatric axis I disorders (mainly anxiety/substance use disorders) and with the total number of mood episodes during the course of the illness (Henry et al., 2008). However, that study did not discriminate emotional response in terms of valence (positive, negative) or arousal and so some negative findings might be explained by the absence of any assessment of emotional 'sub-components'. Rubin et al. (2012) have recently concluded that the use of the AIM total score 'may mask the nuanced patterns that emerge for the subscales and result in misleading conclusions regarding the true relationships' and suggested that researchers should generally not rely on the AIM total score (Rubin et al., 2012).

The aim of this study is thus to test the utility of the AIM scale as a measure of abnormal emotional reactivity in a clinically representative sample of euthymic patients with BD, to (i) investigate the dimensional structure of the French language version of the AIM,

(ii) examine whether the sub-components of emotional response identified in patients with BD are similar to those reported in non-clinical populations, and (iii) explore any associations between AIM sub-scale scores, and clinical characteristics of BD.

2. Methods

2.1. Sample

With appropriate Ethical Committee and institutional review board approval, we obtained written informed consent from all study participants. The consent process involved a detailed description of the study by a psychiatrist supplemented by written information summarizing the protocol and project for the subjects.

Patients were interviewed using the French version (Preisig et al., 1999) of the Diagnostic Interview for Genetic Studies (DIGS) (Nurnberger et al., 1994) to assess lifetime DSM-IV axis I diagnoses (American Psychiatric Association, 1994). Familial history of any DSM-IV axis I diagnoses was investigated using the Family Interview for Genetic Studies (Maxwell, 1992). The final sample comprised 310 out-patients recruited at four university-affiliated psychiatric departments in France (Créteil, Nancy, Marseille and Bordeaux) who met the following inclusion criteria: age ≥ 18 years; a mental disorder fulfilling DSM-IV criteria for BD type I or type II; currently meeting established criteria for euthymia, i.e. having a score < 5 on both the Montgomery–Asberg Depression Rating Scale (Montgomery and Asberg, 1979) and the Mania Rating Scale (Bech et al., 1978). These criteria were applied in order to minimize 'contamination' of self-rated affective shifts associated with sub-syndromal or residual symptoms and to reduce any recall bias during the assessment of lifetime disease history.

2.2. Affect intensity measure (AIM)

A French translation of the AIM was developed and then back-translated by an independent bilingual scientific translator. For the purposes of this study, BD participants completing the AIM were asked to describe their affect during euthymic period and not during manic or depressive episode.

The AIM comprises 40 items and defines affect intensity by responses to a given level of emotion-provoking stimulation. Each item is rated on a six-point scale from 1 to 6 (never to always) or, for the 11 reversed items (12, 16, 19, 24, 26, 28, 29, 31, 33, 37 and 40), from 6 to 1 (never to always). The total score is the mean of items scores. All sub-scores were calculated as the mean of items scores loading to the factor.

The original authors demonstrated the validity and the temporal stability of the AIM, with an alpha coefficient of 0.90–0.94 and the test–retest correlations were ≥ 0.80 at 3 months (Larsen et al., 1986, 1987; Diener et al., 1985a, 1985b).

2.3. Indicators of the course of bipolar disorder

We selected key clinical variables identified in previous research as important characteristics of BD and indicators of course of illness including number of episodes per annum; onset characteristics (early age at onset ≤ 21 years, manic versus depressive polarity at onset, psychotic features at onset); rapid cycling; suicide attempts; substance misuse (abuse and/or dependence) and/or the presence of anxiety disorders. For substance misuse we focused on alcohol and cannabis as other forms of drug misuse were rare ($< 5\%$ in our sample). Likewise, for anxiety disorders, we examined any associations with the three most frequently reported comorbidities (panic disorder, social phobia, and generalized anxiety disorder).

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