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Preliminary communication

Sensitivity and specificity of a new bipolar spectrum diagnostic scale

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Abstract

Objective: To assess the sensitivity and specificity of a self-report questionnaire for bipolar disorder, the Bipolar Spectrum Diagnostic Scale (BSDS). *Methods*: The BSDS was administered to 68 consecutive patients with bipolar illness and 27 consecutive patients with unipolar major depressive disorder. Created by Ronald Pies, it consists of a descriptive story that captures subtle features of bipolar illness, to which patients may assent on a sentence-by-sentence basis. BSDS scores were compared to clinicians' *DSM-IV*-based diagnoses. *Results*: Sensitivity of the BSDS was 0.76, approximately equal in bipolar I and II/NOS subjects (0.75 and 0.79, respectively). The BSDS identified 85% of unipolar-depressed patients as not having bipolar spectrum illness. A shift in the threshold of the BSDS resulted in a large increase in specificity (from 0.85 to 0.93), without a significant loss of sensitivity. *Conclusions*: The BSDS was highly sensitive and specific for bipolar spectrum illness, especially with the amended threshold for positive diagnosis.

Keywords: Self-report; Rating scales; Bipolar disorder; Diagnosis; Misdiagnosis

1. Introduction

The bipolar spectrum is an important area of recent research. Labeled Type II and NOS in *DSM-IV*, recent studies have begun to elucidate the nature of these conditions, such as the depressive mixed state (Akiskal and Benazzi, 2003; Brieger et al., 2003), cyclothymia (Akiskal et al., 2003; Perugi et al., 2003), irritable presentations (Benazzi and Akiskal, 2003a), the "soft" bipolar spectrum (Akiskal, 2003; Hantouche et al., 2003) and bipolar spectrum disorder (Ghaemi et al., 2002). It has been demonstrated that these bipolar spectrum conditions are associated with notable disability (Judd and Akiskal, 2003) and that the current diagnostic gold standard, the Structured Clinical Interview for *DSM-IV* (SCID), is not suffi-

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ciently sensitive to the diagnosis of hypomania or subthreshold manic states (Benazzi and Akiskal, 2003b). There is a need for better and simpler ways to identify these conditions.

Recently, Hirschfeld et al. (2000) developed and tested a self-report scale for bipolar disorder: the Mood Disorder Questionnaire (MDQ). The MDQ was shown to have 0.73 sensitivity and 0.90 specificity, when measured against a SCID by telephone (American Psychiatric Association, 1994). A follow-up study (Hirschfeld et al., 2003), utilizing a representative sample of the general US population indicated much lower sensitivity (0.28) but higher specificity (0.97). We recently conducted a study to verify the sensitivity of the MDQ in a population of bipolar spectrum patients, and found that the MDQ's sensitivity was good for bipolar type I (0.70) but less impressive for bipolar type II or NOS (0.30) (Miller et al., 2002). Recently, another scale has been developed by Ronald Pies to target bipolar II and NOS conditions: the Bipolar Spectrum Diagnostic Scale (BSDS). The current study is the first clinical validation study of the BSDS. We hypothesize that the BSDS may be an efficient self-rating scale for the entire bipolar spectrum and may be a valuable supplement to the clinician's semi-structured interview.

2. Methods

Subjects included 68 bipolar-spectrum patients (44 bipolar type I, 3 bipolar type II or 21 bipolar NOS) treated at the outpatient clinic of Cambridge Hospital as well as a community psychiatric clinic affiliated with Yale Medical School. We combined the bipolar II and NOS groups as both are characterized by milder manic symptoms. In addition, a control group of 27 unipolar patients was assessed.

The Cambridge Hospital Institutional Review Board approved the protocol. Diagnoses were made according to *DSM-IV* criteria using the mood module of the SCID applied by clinicians with expertise in mood disorders (Association, 1994). In addition to *DSM-IV* criteria, bipolar NOS diagnoses were extended by guidelines for bipolar spectrum symptoms as proposed by Akiskal and Pinto (1999). All diagnoses were made blind to patients' scores on the BSDS or other self-report measures.

The BSDS (see Appendix A) was originally designed by one of the authors (R.P.) to detect the milder portions of the bipolar spectrum in outpatients. Two of the other authors (S.N.G. and C.J.M.) subsequently revised it. The final version is composed of two parts. The first part is a paragraph containing 19 positively valenced sentences describing many of the symptoms of bipolar disorder. For instance, one sentence reads: "Some individuals, during these 'high' periods, take on too many activities at once." Each sentence is followed by an underlined space for subjects to place a checkmark if they feel that it applies to them. Each checkmark is worth one point.

The second part of the BSDS is one simple multiple-choice question, asking subjects to rate how well the story describes them overall. There are four possible answers from which to choose: "This story fits me very well, or almost perfectly" (worth 6 points), "this story fits me fairly well" (4 points), "This story fits me to some degree" (2 points), and "This story does not really describe me at all" (0 points). Thus, the total score on the BSDS can range from 0 to 25.

Clinically, prior to this validation study, we had quantified scores into one of four categories, based on point totals: a total score from 0 to 6 indicates that bipolar disorder is "highly unlikely;" 7 to 11 indicates "low probability;" 12 to 19 indicates "moderate probability;" and 20 to 25 indicates that bipolar disorder is "highly likely." We considered "moderate probability" and "highly likely" to represent positive screens for bipolar disorder on the BSDS. A secondary goal of our investigation was to determine if these thresholds resulted in optimum sensitivity and specificity for the BSDS.

Specificity was examined in the unipolar group and sensitivity in the bipolar spectrum group. Statistical analyses consisted of chi square or Fisher exact test for categorical data, and non-parametric Mann–Whitney *U*-test for comparisons of continuous data due to lack of a normal underlying distribution. All *t*-tests were two-tailed. *P*-values below 0.05 were considered statistically significant. All above tests were conducted with Statview statistical software for Windows (SAS Institute, Cary, NC). Sensitivities and specificities are reported as 95% confidence intervals and were computed by statistical software provided by Dawson and Trapp (2001). Data are presented as medians with ranges.