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Outpatients with schizophrenia and bipolar I disorder: do they differ in their cognitive and social functioning?

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Abstract

The authors used a battery of cognitive and social functioning measures to evaluate stable outpatients with schizophrenia ($n = 74$) and bipolar I disorder ($n = 26$) who were receiving care at community and rehabilitation programs. The groups did not differ significantly on 36 of 41 measures. For most variables, comparisons between groups yielded effect sizes of < 0.5. These results suggest that individuals with bipolar I disorder receiving community and rehabilitation services have many social and cognitive deficits that are as severe as those in schizophrenia. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

That schizophrenia is associated with deficits in cognitive and social functioning is well established (Leary et al., 1991; Blanchard and Neale, 1994). Less is known about the impairments of patients with bipolar I disorder and how these impairments compare with those found in schizophrenia. While it is assumed that schizophrenia is characterized by more severe deficits than bipolar disorder, research studies have yielded conflicting results (Goldberg, 1999). Bipolar patients ascertained during a hospital admission have been found to have problems in social competence similar to those found in schizophrenia (Bellack et al., 1989). Studies of bipolar patients followed up after an index hospitalization also show that many have significant problems in their social functioning (Dion et al., 1988; Grossman et al., 1991)

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Studies also indicate that patients with bipolar disorder and other severe mood disorders have cognitive impairments (Jeste et al., 1996; Tham et al., 1997; Zihl et al., 1998; Van Gorp et al., 1999). Comparisons between the cognitive functioning of patients with bipolar I disorder and patients with schizophrenia have tended to show differences on some, but not all, cognitive measures (Goldberg et al., 1993; Tam et al., 1998; Hobart et al., 1999; Krabbendam et al., 2000). Some studies utilizing a neuropsychological assessment have found little to no difference between the performance of patients in the two diagnostic groups (Hoff et al., 1990; Albus et al., 1996; Addington and Addington, 1997). Of note is that previous investigations have not evaluated patients' cognitive and social functioning in the same study.

The purpose of the current study was to compare the cognitive performance and social functioning of individuals with schizophrenia and bipolar I disorder.

2. Methods

Study participants were recruited from the community and rehabilitation outpatient programs of the Sheppard Pratt Foundation. Inclusionary criteria were: (1) DSM-IV diagnosis of schizophrenia, including schizoaffective disorder, mainly schizophrenia, or bipolar I disorder, confirmed by the treating doctor; (2) age between 18 and 65 years; and (3) overall functioning rated as stable over the previous 30 days by the patient's primary clinician. Of 163 eligible patients, 100 (61%) agreed to participate and provided written informed consent after the study procedure had been fully explained. The study was approved by the Sheppard Pratt Institutional Review Board. Participants in the study did not differ significantly from non-participants in age, gender, or diagnostic group (all $P > 0.05$).

A total of 74 outpatients with schizophrenia and 26 outpatients with bipolar disorder participated in the study. The schizophrenia and bipolar groups did not differ significantly on the demographic variables of age, educational level, duration of illness, number of hospitalizations, gender, race, history of substance abuse, marital status (all $P > 0.05$ by t-test or chi-square analysis). The groups did differ on the Positive and Negative Syndrome Scale (PANSS; Kay, 1991); the patients with schizophrenia had significantly higher scores ($P < 0.05$) on the positive (16.1 vs. 13.5), negative (17.1 vs. 14.2) and total scores (66.9 vs. 58.7), but not the general score (33.6 vs. 31.1). A majority of patients from both diagnostic groups, 81% and 65%, attended a psychosocial day program. Patients had been ill an average of 20.0 ($\pm$8.7) years in the schizophrenia group and 21.6 ($\pm$9.8) years in the bipolar group. In terms of number of previous hospitalizations, the schizophrenia group averaged 8.8 ($\pm$12.6) and the bipolar group 7.0 ($\pm$7.4).

All patients in the study were treated by program psychiatrists and prescribed psychotropic medications. Among the schizophrenia group, all patients were prescribed anti-psychotic medications; of these, 52 (70%) were prescribed atypical anti-psychotic medications. Some patients in the schizophrenia sample also received antidepressant medications (40 patients, 54%), lithium (12, 16%), anti-convulsant mood stabilizers (33, 45%) and anti-parkinsonian agents (21, 28%). Among the patients with bipolar disorder, 18 were prescribed anti-psychotics, 11 (42%) were on atypical anti-psychotic medications. Anti-convulsant mood stabilizers were prescribed to 21 (81%) of the bipolar patients, anti-depressants to 21 (81%), lithium to 13 (50%), and anti-parkinsonian agents to 3 (12%).

Participants were administered a cognitive test battery: the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS), (Randolph, 1999), the Halstead–Wepman Aphasia Screening Test (Halstead and Wepman, 1959), the Trail Making Test, Part A (Reitan, 1979) and two subtests from the Wechsler Adult Intelligence Scale III (Wechsler, 1997), Information and Letter Number Sequencing. In a separate session within two weeks, subjects were administered the PANSS and two self-report measures of social functioning: the Social Functioning Scale (SFS) (Birchwood et al., 1990) and the Quality of Life

Table 1
Mean scores on neurocognitive and social functioning scales in patients with schizophrenia and patients with bipolar disorder ($N = 100$)

Variable[a]	Schizophrenia ($n = 74$)		Bipolar disorder ($n = 26$)		Effect size[b]
	Mean	S.D.	Mean	S.D.	
RBANS immediate verbal memory[c]	78.25	19.39	91.24	18.72	0.68
RBANS visuospatial constructional	82.36	18.41	86.48	20.96	0.21
RBANS language	85.85	13.09	92.84	13.68	0.52
RBANS attention	73.18	17.97	79.32	13.89	0.39
RBANS delayed memory	79.72	20.67	87.20	16.94	0.40
RBANS total	74.64	16.40	83.32	14.31	0.57
Halstead–Wepman Aphasia Screening	5.89	3.94	5.16	3.54	−0.20
WAIS information subtest	10.00	3.15	10.36	3.30	0.11
WAIS letter no. sequencing subtest	7.40	3.15	8.60	2.53	0.42
Trail Making Test A	45.84	27.28	43.24	23.29	−0.04
SFS Engagement	10.77	2.37	11.62	2.33	0.36
SFS communication	7.35	1.66	7.69	1.64	0.21
SFS ADLs frequency	28.59	4.74	29.38	3.78	0.19
SFS recreation activities	22.03	2.63	22.46	5.66	0.07
SFS social activities	16.27	7.66	18.31	8.13	0.26
SFS ADLs competence	34.95	3.73	35.85	3.26	0.26
QOLI global satisfaction	4.37	1.56	4.42	1.43	0.03
QOLI satisfaction with living situation	5.19	0.87	5.55	0.60	0.49
QOLI satisfaction with daily activities	4.74	1.23	5.09	0.92	0.32
QOLI satisfaction with family contact	4.44	1.48	4.68	1.72	0.15
QOLI satisfaction with social relations	4.75	1.02	4.94	1.14	0.18
QOLI satisfaction with finances[c]	3.95	1.54	2.86	1.57	−0.70
QOLI satisfaction with health	4.43	1.37	4.33	1.21	−0.08
QOLI daily activities	4.54	1.54	4.89	1.39	0.24
QOLI family contact	7.01	1.63	6.80	2.24	−0.11
QOLI social relations	10.31	4.33	12.31	3.36	0.52
QOLI finances	3.50	1.31	3.19	1.47	−0.22
QOLI legal and safety	0.23	0.54	0.42	0.58	0.34
MCAS response to stress and anxiety	3.36	0.93	3.50	0.71	0.17
MCAS ability to manage money	3.26	0.83	3.73	0.96	0.53
MCAS independence in daily life	4.05	0.83	4.46	0.71	0.53
MCAS acceptance of illness	3.70	1.09	4.27	0.96	0.55
MCAS social acceptability[c]	4.00	0.85	4.58	0.58	0.81
MCAS social interest	3.50	1.06	3.58	1.21	0.05
MCAS social effectiveness[c]	3.95	0.98	4.54	0.76	0.68

Table 1 (*Continued*)

Variable[a]	Schizophrenia ($n = 74$)		Bipolar disorder ($n = 26$)		Effect size[b]
	Mean	S.D.	Mean	S.D.	
MCAS social network	4.15	0.39	4.19	0.49	0.09
MCAS meaningful activity	4.08	0.74	4.19	0.69	0.15
MCAS medication compliance[c]	3.35	1.28	4.42	0.95	0.96
MCAS cooperation with providers	4.65	0.58	4.73	0.60	0.14
MCAS alcohol/drug abuse	4.77	0.48	4.85	0.37	0.19
MCAS impulse control	4.77	0.45	4.58	0.58	−0.37

[a] RBANS, The Repeatable Battery for the Assessment of Neuropsychological Status, scores reported are index scores; Halstead–Wepman Aphasia Screening Test, scores reported are raw error scores; Trail Making Test, scores represent performance in seconds; WAIS, Wechsler Adult Intelligence Scale III, scores reported are scaled scores; SFS, the Social Functioning Scale, scores reported are raw scores; QOLI, the Quality of Life Interview, scores reported are the average rating in each section; MCAS, the Multnomah Community Ability Scale, scores reported are raw scores. Higher scores represent better performance, functioning, or satisfaction with the exception of scores for the Trail Making Test, Halstead-Wepman Test, and QOLI Legal and Safety where higher scores represent greater impairment. All comparisons involved $n = 74$ patients with schizophrenia and $n = 26$ patients with bipolar disorder except for the cognitive measures which had $n = 73$ patients with schizophrenia and $n = 25$ patients with bipolar disorder.

[b] Effect sizes were calculated as the difference between the mean scores divided by the average of the standard deviations.

[c] Variables which were significantly different between groups ($P < 0.01$).

Interview (QOLI) (Lehman, 1988). Participants were also rated on the Multnomah Community Ability Scale (MCAS) (Barker et al., 1994).

For the variables assessing social functioning and cognitive performance, patients with schizophrenia and bipolar disorder were compared with *t*-tests for independent samples with the critical value set at $P < 0.01$ because of the multiple comparisons that were performed. Effect sizes were calculated for each comparison. An effect size > 0.5 was the criterion for a medium effect and one between 0.2 and 0.5 for a small effect (Cohen, 1988). Variables that were significant in the univariate comparisons and which had an effect size > 0.5 were entered into a discriminant function analysis to predict group membership.

3. Results

Patients with bipolar I disorder and those with schizophrenia were compared on 41 cognitive and social functioning variables. As shown in Table 1, five variables differed significantly between groups by *t*-test ($P < 0.01$) and had the largest effect sizes: RBANS immediate memory; MCAS social acceptability; MCAS social effectiveness; MCAS medication compliance and QOLI satisfaction with finances. In all of these comparisons except for the QOLI satisfaction with finances, the bipolar I disorder group patients showed less impairment than the patients with schizophrenia.

Variables that differed between groups on the *t*-tests and had an effect size > 0.5 were entered into a discriminant function analysis. The classification table from the discriminant function analysis indicates that 77/98 (79%) of patients were correctly classified as schizophrenia vs. bipolar disorder.

Comparison between groups yielded an additional six variables with an effect size > 0.5 and another 15 with an effect size between 0.2 and 0.5; in all but three of the comparisons, the patients with bipolar disorder showed less impairment than the patients with schizophrenia. The remaining 15 variables showed effect sizes < 0.2; these included performance on Trails A, SFS frequency of activities of daily living, SFS recre-

ational activities, MCAS social interest and QOLI satisfaction with family contact.

4. Discussion

We studied stable outpatients with schizophrenia and bipolar I disorder receiving services at community and rehabilitation programs. We found that the patients with bipolar I disorder were significantly less impaired than the patients with schizophrenia on measures of social acceptability, social effectiveness and medication compliance. Also, the patients with bipolar disorder were less satisfied with their finances. The cognitive variable for which we found the largest between-group difference was immediate verbal memory. This measure was also found to be among the more discriminating in a comparison of schizophrenia and bipolar disorder patients by Hobart et al. (1999). In another study, verbal memory was found to be impaired in a sample of stabilized bipolar patients (Van Gorp et al., 1999).

Our results are consistent with previous studies which have found a similar pattern of cognitive functioning in patients with bipolar disorder as compared to those with schizophrenia (Hoff et al., 1990; Albus et al., 1996; Addington and Addington, 1997; Krabbendam et al., 2000). Some previous studies in the literature have shown more extensive differences between the cognitive performance of patients with schizophrenia and those with bipolar disorder (Goldberg et al., 1993; Tam et al., 1998). Differences in patient samples or phase of illness may account for some of these discrepancies in results. Unselected bipolar patients who receive care in general psychiatric settings may be more different in their performance from patients with schizophrenia than a subgroup of patients with bipolar disorder who receive intensive outpatient care.

Discrepancies in findings may also be due to differences in testing batteries used to assess patients. For example, Hobart et al. (1999) found a significant difference between groups on the Wechsler Full Scale IQ, which was not included in our cognitive measures. Tam et al. (1998) found differences on information-processing tasks, which were also not included in the current study. The RBANS, used in our study and that of Hobart et al. (1999), is a relatively new instrument and has not been available to previous investigators.

Our results substantiate the significant social impairment found among some bipolar patients (Dion et al., 1988; Grossman et al., 1991). On most measures of social functioning, our patients with bipolar disorder were not significantly different from those in the schizophrenia group. These measures included ratings of competence at activities of daily living, frequency of activities of daily living, participation in social activities, frequency of family contact, and frequency of social relations. Previous studies investigating the social functioning of patients with bipolar disorder, sometimes in comparison with patients with schizophrenia, have tended to ascertain patients during hospital admission (e.g. Bellack et al., 1989; Grossman et al., 1991). While all of our bipolar patients had been hospitalized at some point in the past, the current sample was recruited from stable outpatients. Our findings about the social functioning of patients with bipolar disorder complement findings of other studies that have been performed on hospitalized and post-hospitalized samples.

In our sample, the patients with bipolar disorder were significantly less impaired than the patients with schizophrenia in their social effectiveness, a rating of verbal social skills and in their social acceptability, a rating of general social presentation. No previous studies have compared patients with bipolar disorder and those with schizophrenia on these specific measures. Our findings are consistent with the usual clinical picture of the two disorders in which bipolar disorder is associated with less social impoverishment than schizophrenia is.

Taken as a whole, our findings suggest that neurocognitive and social functioning deficits are not diagnosis specific. These findings are consistent with some recent genetic (Maier et al., 1999), epidemiological (Torrey et al., 1997) and imaging studies (Altshuler, 1993), which suggest that there may be considerable overlap between schizophrenia and bipolar disorders.

While the patients with bipolar disorder in this

sample are not necessarily representative of the universe of persons with this disorder, they are likely to be typical of patients who receive community and rehabilitation services. As such, our results add to the recognition that there is a subgroup of patients with bipolar disorder, such as the patients with bipolar disorder in this sample, who have persistent deficits and who require intensive psychiatric services. A formal assessment of cognitive and social functioning may add to a better characterization of this group.

The reliability of diagnoses among persons in the sample could be questioned. However, we verified with each patient's treating clinician that the patient's diagnosis met DSM-IV criteria. Another methodological issue concerns the possibility that we may have been unable to detect small differences between groups because of the size of our sample. However, our sample size was comparable to those of other studies in the literature, so this is an unlikely explanation for any differences between our findings and those of other studies.

A final methodological issue in our study is the possibility that medications may have differentially affected the performance of patients in the two diagnostic groups. There has been extensive discussion in the literature about the effects of lithium, anti-parkinsonian agents and neuroleptics on neurocognitive performance. All of our patients were receiving prescribed medications and most were taking more than one medication; the mean number of medications was 3.2 for the bipolar patients and 2.4 for the patients with schizophrenia. In our sample, more patients with schizophrenia were prescribed anti-psychotic medications and at higher doses than the individuals with bipolar disorder. The patients with schizophrenia were also more likely to be receiving anti-parkinsonian agents. However, more patients with bipolar disorder were receiving lithium. It was not possible to determine the role of medication on our outcome measures because of the various combinations of medications prescribed to patients in our sample.

The findings in this study point to a need for further investigation of the multiple domains of functioning among patients with bipolar I disorder. Additional studies may further describe the deficits of this group that are relevant to the services that they receive in community settings.

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