Revista Brasileira de Psiquiatria. 2017;39:342–345
Associação Brasileira de Psiquiatria
doi:10.1590/1516-4446-2016-2101

BRIEF COMMUNICATION

Increased affective empathy in bipolar patients during a manic episode

Anna Bodnar, Janusz K. Rybakowski

Department of Adult Psychiatry, Poznan University of Medical Sciences, Poznan, Poland.

Objective: To assess both cognitive and affective empathy in patients with bipolar disorder (BD) during an acute manic or depressive episode.
Methods: The study included 25 patients with BD (aged 35±14 years) during an acute manic episode, 25 bipolar patients (aged 41±14 years) during a depressive episode, and 25 healthy control subjects (aged 36±11 years). Cognitive and affective empathy were assessed using the Multifaceted Empathy Test.
Results: In both manic and depressive patients, a significant deficit in cognitive empathy was demonstrated. However, indices of affective empathy were significantly higher in the manic group than in depressed and control subjects. In the depressed patients, indices did not differ from those of healthy controls. For affective empathy, a significant positive correlation was found with intensity of manic symptoms and a negative correlation was found with intensity of depressive symptoms. No such correlations were observed with cognitive empathy.
Conclusion: We found evidence of increased affective empathy (overempathizing) during a manic episode in bipolar patients. This phenomenon may be connected with disturbances in emotion inhibition related to anastrophic thinking and associated with increased activity of mirror neurons, all of which occur during a manic episode.

Keywords: Mood disorders, bipolar; cognitive neuroscience; emotion; tests/interviews, psychometric; models/theories of psychiatry

Introduction

The main aspects of social cognition include the ability to mentalize, i.e., theory of mind (ToM), and the ability to empathize with the mental and emotional states of others. Another domain of social cognition is affective perception, the main component of which is facial emotion recognition. In recent years, an increasing number of social cognition studies have been conducted in bipolar disorder (BD). A majority of these studies has involved investigating the ToM, and a deficit in this domain in bipolar patients, occurring also during the euthymic state, has been confirmed in recent meta-analyses.[1,2] Impairment of facial emotion recognition has also been observed in bipolar patients, with specific deficits occurring during acute episodes (mania or depression).[3,4]

Significantly fewer studies have addressed empathy, a domain which can include cognitive and affective constructs. Cognitive empathy means cognitive understanding of the emotional state and point of view of the other person, hidden behind the emotion expressed. It is also an ability to engage in the cognitive processes of the psychological perspective of the other, enabling one to recognize the thoughts, emotions, attitudes, and intentions of other people. Affective empathy is an ability to share the affective state of other persons and to evoke an emotional response to such a state. It can also be defined as a "vicarious" emotional response enabling the person to match another's emotions and to experience the same emotion as he or she.

Previous studies on the empathic abilities of bipolar patients have used various tools for assessment, but the clinical state of the patients studied was frequently neglected. In 2009, Shamay-Tsoory et al.,[5] using the Interpersonal Reactive Index (IRI), demonstrated that 19 remitted bipolar patients obtained significantly lower scores of cognitive empathy and higher scores of affective empathy than 20 matched healthy control subjects. Employing the same tool (IRI) in BD patients, Cusi et al.[6] reported significantly reduced levels of cognitive empathy and higher levels of personal distress in response to other people's negative experiences in these patients than in control subjects. Most of their BD patients were in a mild depressive state. Derntl et al.,[7] comparing emotional deficit in subjects with schizophrenia (SCZ), BD, depression, and controls, found that 24 bipolar patients showed significantly reduced accuracy in emotion recognition and affective responsiveness compared to controls. These subjects performed similarly to those with depression and showed significantly better emotional perspective taking compared to the SCZ group. However, no information on the clinical status of the BD patients participating in this study was provided. Baez et al.[8] compared 15 BD patients

Correspondence: Janusz K. Rybakowski, Department of Adult Psychiatry, Poznan University of Medical Sciences, ul.Szpitalna 27/33, 60-572, Poznan, Poland.
E-mail: janusz.rybakowski@gmail.com
Submitted Sep 09 2016, accepted Nov 07 2016, Epub Mar 13 2017.

in various clinical states (euthymic, depressed, and subsyndromal) with 15 SCZ and 30 control subjects. They found that BD patients demonstrated some deficits in accuracy and reaction times for emotional processing compared to their control subjects. In the Empathy to Pain Task, both BD and SCZ subjects exhibited deficits in various aspects of the test, which were more severe in SCZ.

In our preliminary research, we used the Multifaceted Empathy Test (MET) in BD and SCZ patients who were studied after an acute episode of their respective disorders. Disease severity after mania was no higher than 12 points on the Young Mania Rating Scale (YMRS), no higher than 14 points on the Hamilton Depression Rating Scale (HDRS) after depression, and 70 points or less on the Positive and Negative Syndrome Scale (PANSS) after an acute schizophrenic episode. Both groups showed deficits in the cognitive aspects of empathy. In the BD patients, after a manic episode with subsyndromal manic symptoms, we found hyperactivity of the affective aspects of empathy.[9]

In the present study, we assessed both cognitive and affective empathy in bipolar patients during acute manic and depressive episodes, and tried to find a possible relationship between empathy and clinical state (intensity of manic and depressive symptoms).

Methods

Patients

The study was performed on 50 patients with bipolar mood disorder (20 male, 30 female), aged 19-65 years, with a mean duration of illness of 11±10 years. All had been hospitalized in the inpatient clinic of the Department of Adult Psychiatry, Poznan University of Medical Sciences, Poznan, Poland, for an acute manic or depressive episode of BD. A consensus diagnosis of BD had been established for each patient by at least two psychiatrists, according to DSM-IV criteria based on the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID).[10] Exclusion criteria covered any other psychiatric comorbidity or serious medical condition.

Twenty-five patients (10 male, 15 female), mean age 35±14 years, were studied during an acute manic episode and 25 patients (10 male, 15 female), mean age 41±14 years, during a depressive episode. The criterion for inclusion in the study for manic patients was mania severity $\geqslant$ 20 points on the YMRS, and, for depressive patients, depression severity $\geqslant$ 18 points on the 17-item HDRS. On the day of the study, the patients received pharmacological treatment (antipsychotics and/or mood stabilizers in the mania group and antidepressants and/or mood stabilizers in the depression group).

The comparison group consisted of 10 healthy men and 15 healthy women, aged 36±11 years, who had volunteered to be studied in response to an internet advertisement. They did not report any psychiatric disturbance in themselves nor in any first-degree relatives.

The mean educational attainment (in years of schooling) was 15±3 years in manic patients, 13±3 years in depressed patients, and 16±2 years in control subjects.

The study was approved by the Bioethics Committee of Poznan University of Medical Sciences, and all participants gave written informed consent after the nature of the procedures had been fully explained to them.

The Multifaceted Empathy Test (MET)

All subjects were assessed using the MET. This test was designed as a measure of empathy that allows separate assessments of the cognitive and emotional aspects of empathic functioning. It was first described in 2008 by a group of German investigators, led by Isabel Dziobek,[11] in a study of autistic patients. In the MET, six components are delineated: two for cognitive empathy (for positive and negative stimuli) and four for affective empathy (explicit for positive and negative stimuli, implicit for positive and negative stimuli).

The German version of the MET was adapted into Polish by five independent translators, with 10 psychologists serving as competent judges. Twenty pictures which obtained the best consistency in translation and at least 70% reliability in assessment were selected.

The subjects were asked three questions about each picture:

1. "How is the person in the picture feeling?" This question assesses cognitive empathy. The subject is asked to pick one out of the four mental state descriptors provided along with the picture, where only one is correct.
2. "To what extent are you feeling like the person in the picture?" This question assesses explicit affective empathy. The subject is asked to rate the degree of empathic concern they feel for the person in the picture, on a scale of 0 to 9, where 0 means not at all and 9 means very much.
3. "How much are you moved by the picture?" This question assesses implicit affective empathy. The subject is asked to rate the level of emotional arousal connected with the person in the picture, on a scale of 0 to 9, where 0 means not at all and 9 means very much.

Statistics

The study parameters were compared between the three groups (depressed, manic, and control). The Shapiro-Wilk test was applied to check for normality of distribution. Because the data were consistent with a normal distribution, analysis of variance (ANOVA) with Tukey's post-hoc test was applied. The Pearson r test was used to determine whether correlation existed between variables. All calculations were performed using the Statistica (StatSoft-Poland) version 10 statistical package. The significance level was set at $p < 0.05$.

Results

The three studied groups were homogeneous in age ($F_{2,72} = 1.37$, $p = 0.26$). They did, however, differ as to educational attainment ($F_{2,72} = 7.96$, $p = 0.001$). The control group had higher levels of education compared to the depressed group ($p < 0.01$), but not compared to the manic group ($p = 0.32$). Patients with depression had

Table 1 Cognitive and affective empathy assessed by the Multifaceted Empathy Test during depression (A), mania (B), and in healthy control subjects (C)

	Group			Analysis of variance			Post-hoc test		
Empathy	Depression (A)	Mania (B)	Control (C)	$F_{2,72}$	p	η^2	A-B	A-C	B-C
Cognitive									
Total score	13.56 (3.25)	13.40 (2.29)	16.32 (1.73)	10.74	< 0.001	0.23	0.972	< 0.001	< 0.001
Positive stimuli	7.04 (1.91)	7.40 (1.50)	8.36 (1.44)	4.39	0.16	0.11	0.715	0.015	0.100
Negative stimuli	6.52 (1.69)	6.00 (1.68)	7.96 (0.98)	11.66	< 0.001	0.25	0.436	0.003	< 0.001
Affective									
Total score	199.72 (65.67)	277.88 (55.31)	178.84 (59.33)	18.77	< 0.001	0.34	< 0.001	0.442	< 0.001
Positive stimuli	85.72 (39.10)	140.08 (32.17)	81.92 (31.20)	22.45	< 0.001	0.38	< 0.001	0.919	< 0.001
Negative stimuli	113.60 (36.08)	137.68 (34.67)	96.92 (31.53)	9.00	< 0.001	0.20	0.039	0.202	< 0.001
Explicit stimuli	94.36 (34.19)	137.00 (32.90)	89.32 (33.74)	15.18	< 0.001	0.30	< 0.001	0.857	< 0.001
Explicit positive stimuli	39.08 (21.88)	70.48 (17.14)	42.20 (17.49)	20.81	< 0.001	0.37	< 0.001	0.830	< 0.001
Explicit negative stimuli	55.28 (18.60)	66.52 (23.14)	47.12 (18.39)	5.84	0.004	0.14	0.127	0.331	0.003
Implicit stimuli	105.36 (33.38)	140.88 (26.73)	89.52 (27.36)	20.13	< 0.001	0.36	< 0.001	0.143	< 0.001
Implicit positive stimuli	46.64 (18.48)	69.80 (16.41)	39.72 (14.73)	22.49	< 0.001	0.38	< 0.001	0.310	< 0.001
Implicit negative stimuli	58.72 (18.69)	71.08 (14.66)	49.80 (14.50)	11.06	< 0.001	0.24	0.022	0.129	< 0.001

Data presented as mean (standard deviation).

marginally lower levels of education compared to manic ones (p = 0.06).

On the day of the study, the mean disease severity was 27±4 points (YMRS) in the manic group and 24±2 points (HDRS) in the depressive group.

Measures of cognitive and affective empathy during depression, mania, and in the healthy control subjects, as assessed by the MET, are shown in Table 1.

Deficits in cognitive empathy scores, both total and for negative stimuli, were demonstrated in both the manic and depressive groups. ANOVA did not reveal any difference between the groups in terms of cognitive empathy for positive stimuli (F = 4.39; p = 0.16). However, after application of a post-hoc test, a significant deficit in cognitive empathy for positive stimuli was found in depressed patients, but not in manic ones, compared to healthy controls. Total scores for cognitive empathy did not correlate with the intensity of either manic or depressive symptoms (correlation coefficients -0.06 and 0.07, respectively)

In affective empathy, all indices (total, explicit, and implicit scores for both positive and negative stimuli) were significantly higher in the manic patients compared to those in the depressive and control subjects. The measures of affective empathy in depressed patients did not differ from those of healthy controls. The total affective empathy score showed a significant positive correlation with the intensity of manic symptoms (r = 0.57; p = 0.003) and a significant negative correlation with the intensity of depressive symptoms (r = -0.55; p = 0.004).

Discussion

The first finding of this study is that a deficit in cognitive empathy occurs during both manic and depressive episodes. This confirms the findings of Shamay-Tsoory et al.,[5] where such a deficit was found in remitted bipolar patients, and of Cusi et al.,[6] who studied patients in a mild depressed state. In the Seidel et al.[12] study, a deficit in cognitive empathy was observed with increased severity of residual hypomanic and depressive symptoms. The lack of significance in differences in cognitive empathy for positive stimuli in manic patients may have been due to the small sample size. Since cognitive empathy overlaps with ToM in some aspects, the results of the study are also in line with recent meta-analyses showing a significant deficit of ToM in bipolar patients, including in remission.[1,2]

However, the most important finding obtained herein is the phenomenon of increased affective empathy (overempathizing) in bipolar patients during manic episodes compared to bipolar patients in depression and healthy subjects. This may correspond to the results of Shamay-Tsoory et al.,[5] obtained in euthymic bipolar patients, and to those of our study performed in subsyndromal BD patients after a manic episode.[9] That such a phenomenon is state-dependent was further confirmed by a significant correlation between affective empathy scores and intensity of manic symptoms in our sample. The mean affective empathy scores during depression were lower than during mania, and were no different from those of control subjects. Furthermore, they correlated negatively with the intensity of depression, which may correspond to results previously obtained in patients with SCZ.[6]

Affective overempathizing in manic patients occurred with both positive and negative stimuli. The latter could be due to the fact that manic patients may show bias in recognizing positive facial emotions relatively to the negative emotions.[13] Conversely, depressed patients were found to have a negative response bias towards sadness.[14] Overempathizing in the area of affective empathy in manic patients may be connected with disturbances of emotion inhibition, in the form of positive emotion persistence, occurring in a manic episode.[15] This may cause an excessive empathic reaction which is not appropriate to the underlying stimuli. Another explanation for increased affective empathy may be the prosocial attitude observed in manic patients, who perceive social stimuli as more positive than they are in reality. This may result from so-called anastrophic thinking, with its conviction of a full understanding of other people. Such a conviction may generate increased results in scales of the affective aspect of empathy.[16] However, as clinical observations

show, a prosocial attitude often does not prevent patients in a manic state from treating persons close to themselves (e.g., a spouse) very badly.

It has been proposed that the human mirror neuron system (MNS) plays an integral role in mediating empathy. This has been evidenced by behavioral studies pointing to a relationship between imitation and empathy and by findings from functional neuroimaging studies that reported a positive correlation between MNS activation and self-report empathy questionnaire scores. However, a specific role of the MNS in different kinds of empathy has not been elucidated.[17] Recently, Mehta et al.,[18] employing a transcranial magnetic stimulation approach, demonstrated that mirror neuron activity correlated positively with severity of manic symptoms. From the results of our study, we hypothesize that, in manic patients, increased activity of the MNS may be connected with increased affective empathy.

One limitation of our study may be the single test used to measure cognitive and affective empathy. Furthermore, the intensity of depression and mania in the patients studied ranged from mild to moderate. However, bearing all these limitations in mind, we believe that the results of our study strongly suggest a connection between mania and increased affective empathy.

Acknowledgements

Thanks are due to Professor Geoffrey Shaw for his linguistic advice.

Disclosure

The authors report no conflicts of interest.

References

1 Samamé C, Martino DJ, Strejilevich SA. Social cognition in euthymic bipolar disorder: systematic review and meta-analytic approach. Acta Psychiatr Scand. 2012;125:266-80.
2 Bora E, Bartholomeusz C, Pantelis C. Meta-analysis of Theory of Mind (ToM) impairment in bipolar disorder. Psychol Med. 2016;46:253-64.
3 Rocca CC, Heuvel Ev, Caetano SC, Lafer B. Facial emotion recognition in bipolar disorder: a critical review. Rev Bras Psiquiatr. 2009;31:171-180.
4 Samamé C. Social cognition throughout the three phases of bipolar disorder: a state-of-the-art overview. Psychiatry Res. 2013;210:1275-86.
5 Shamay-Tsoory SG, Harari H, Szepsenwol O, Levkovitz Y. Neuropsychological evidence of impaired cognitive empathy in euthymic bipolar disorder. J Neuropsychiatry Clin Neurosci. 2009;21:59-67.
6 Cusi A, MacQueen GM, McKinnon MC. Altered self-report of empathic responding in patients with bipolar disorder. Psychiatry Res. 2010;178:354-8.
7 Derntl B, Seidel EM, Schneider F, Hobel U. How specific are emotional deficits? A comparison of empathic abilities in schizophrenia, bipolar and depressed patients. Schizophr Res. 2012;42:58-64.
8 Baez S, Herrera E, Villarin L, Theil D, Gonzalez-Gadea ML, Gomez P, et al. Contextual social cognition impairments in schizophrenia and bipolar disorder. PLoS One. 2013;8:e57664.
9 Wiener D, Andrzejewska M, Bodnar A, Rybakowski J. Disturbances of theory of mind and empathy in schizophrenia and bipolar affective illness. Neuropsychiatry Neuropsychol. 2011;6:85-92.
10 First MB, Spitzer RL, Gibbon M, Williams J. Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-CV). Washington: American Psychiatric Press Inc; 1996.
11 Dziobek I, Rogers K, Fleck S, Bahnemann M, Heekeren HR, Wolf OT, et al. Dissociation of cognitive and emotional empathy in adults with Asperger syndrome using the Multifaceted Empathy Test (MET). J Autism Dev Disord. 2008;38:464-73.
12 Seidel EM, Habel U, Finkelmeyer A, Hasmann A, Dobmeier M, Derntl B. Risk or resilience? Empathic abilities in patients with bipolar disorders and their first-degree relatives. J Psychiatr Res. 2012;46:382-8.
13 Lembke A, Ketter TA. Impaired recognition of facial emotion in mania. Am J Psychiatry. 2002;159:302-4.
14 Bourke C, Douglas K, Porter R. Processing of facial emotion expression in major depression: a review. Aust N Z J Psychiatry. 2010; 44:681-96.
15 Gruber J. A review and synthesis of positive emotion and reward disturbance in bipolar disorder. Clin Psychol Psychother. 2011;18: 356-65.
16 Colom F, Vieta E. Sudden glory revisited: cognitive contents of hypomania. Psychother Psychosom. 2007;76:278-88.
17 Baird AD, Scheffer IE, Wilson SJ. Mirror neuron system involvement in empathy: a critical look at the evidence. Soc Neurosci. 2011;6: 327-35.
18 Mehta UM, Basavaraju R, Thirthalli J. Mirror neuron activity and symptom severity in drug-naïve mania – a transcranial magnetic stimulation study. Brain Stimul. 2014;7:757-9.