Increased affective empathy in bipolar patients during a manic episode

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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
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. 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 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 ≥ 20 points on the YMRS, and, for depressive patients, depression severity ≥ 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 out one 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 (F2,72 = 1.37, p = 0.26). They did, however, differ as to educational attainment (F2,72 = 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
patients, and of Cusi et al.,6 who studied patients in a mild
lack of significance in differences in cognitive empathy for
of residual hypomanic and depressive symptoms. The
cognitive empathy was observed with increased severity
depressed state. In the Seidel et al.12 study, a deficit in
episodes. This confirms the findings of Shamay-Tsoory
empathy occurs during both manic and depressive epi-
s and to those of our study performed in subsyndromal BD
patients after a manic episode.9 That such a phenomenon
overempathizing in bipolar patients during manic episodes
compared to bipolar patients in depression and healthy
subjects. This may correspond to the results of Shamay-
to the small sample size. Since cognitive empathy over-
positive than they are in reality. This may result from
in manic patients may be connected with disturbances of
emotion inhibition, in the form of positive emotion persis-
tence, occurring in a manic episode.15 This may cause an
affective empathy may be the prosocial attitude observed
so-called anastrophic thinking, with its conviction of a
positive than they are in reality. This may result from
in manic patients may have been due to the small sample size. Since cognitive empathy over-
laps 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 (over-
empathizing) 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 inten-
sity 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 sub-
jects. 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 sad-
ness.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 persis-
tence, 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
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 dif-
fERENCE 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 cogni-
tive empathy for positive stimuli was found in depressed
patients, but not in manic ones, compared to healthy con-
trols. 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 symp-
toms (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 epi-

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

| Empathy             | Group          | Analysis of variance | Post-hoc test |
|---------------------|----------------|----------------------|---------------|
|                     | Depression (A) | Mania (B)            | Control (C)   | F<sub>2,72</sub> | p          | η²        | 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     | 0.97 | < 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| 0.957 | < 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).

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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.

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**Disclosure**

The authors report no conflicts of interest.

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