

A comparative study of deficit pattern in theory of mind and emotion regulation methods in evaluating patients with bipolar disorder and normal individuals

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Original Article

Abstract

BACKGROUND: This study compared patterns of deficit in "theory of mind" and "emotion regulation" in patients with bipolar disorder and normal individuals.

METHODS: In this causal-comparative study, subjects were 20 patients with bipolar disorder and 20 normal individuals. Patients were selected via convenience sampling method among hospitalized patients at Razi hospital of Tabriz, Iran. The data was collected through two scales: Reading the Mind in the Eyes Test and Emotion Regulation Questionnaire. The data were analyzed using multivariate analysis of variance.

RESULTS: There were significant differences between patients with bipolar disorder and healthy individuals in theory of mind and emotion suppression. Patient group achieved lower scores on theory of mind and higher scores on emotional suppression compared to the controls. But, in reassessment and total score of emotion regulation there were no significant differences between the two groups.

CONCLUSIONS: This study showed that both "theory of mind" and "emotion regulation" are impaired in patients with bipolar disorder compared to healthy individuals and the patients are more liable to use suppression strategies.

KEYWORDS: Theory of mind, Emotion regulation, Bipolar disorder

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Introduction

Bipolar disorder is a severe mental disorder that is estimated to affect about 1% of the general population. The disorder is characterized by manic and depressive episodes. Although emotional disturbances are core features of these episodes, little systematic researches exist on emotional processing in patients with bipolar disorder.¹ Existing studies have focused mainly on emotion perception,² and less on emotion regulation.³ Emotional dysregulation may

manifest as emotional labeling or exaggerated swings of affect in response to pleasant and unpleasant events.⁴

Individual's ability to control one's emotions is an important skill needed to be learned. Emotion regulation is defined as the process of the beginning, maintaining, modifying, or changing the expression, severity, or continuation of internal feelings and emotions associated with psychosocial and physical processes in accomplishing individual's goals.⁵

A review of psychological literature

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indicates that emotion regulation is an important factor in determining the health and having a good function in social interactions.⁶ Emotion has a significant role in all mood disorders.⁷ Emotional dysregulation occurs in all axis I and half of axis II disorders.⁸

Emotion regulation is evaluated in two important strategies:⁹ 1- Emotion regulation strategies that are activated before the incident (these strategies are activated before the occurrence of the emotion or at the beginning of its development, and can prevent extreme excitement); 2- Strategies that are activated after the incident or after its development (they cannot prevent extreme excitement).

Emotion regulation strategies interpret situation in a way reduce related emotional responses.^{10,11} This process is called reassessment.⁹

Davies and Clark¹² in studying the effect of emotion regulation on rumination found that emotional suppression when dealing with a stressful event causes rumination after the event. Wegner et al.¹³ consider employing strategies to suppress emotion as a cause of rumination and frustration in controlling thoughts. Studies have shown that people who do self-regulation by expressed emotion suppression solve fewer problems than the control group does.¹⁴

The problems in emotion regulation may be affected by cognitive dysfunctions and subsequent disturbances in cognitive-emotional brain network interactions.¹⁵ Prefrontal cortex and associated neural circuits are critical to the operation of many components of the underlying executive functioning¹⁶ as well as in auto-regulation of emotions.¹⁵ One hypothesis is that the clinical picture of bipolar disorder can be partly considered as a result of impaired cognitive control of emotions.¹⁷ Cognitive control is one aspect of executive functioning and cognitive system which solves conflicts in cognitive processing and appropriate performance in facing disturbance.¹⁸

Impaired abilities in higher cognitive

processing of more complex social stimuli, such as facial emotion processing,¹⁹⁻²³ theory of mind,²⁴⁻²⁷ and affect²⁸ may limit the ability of patients with bipolar disorder for normal regulation of emotions.

In recent years, one model of neuropsychological explanation of psychiatric symptoms that has attracted attention is "theory of mind" model that Frith²⁹ proposed for schizophrenia. The ability of "theory of mind", also called "mentalizing", is continuous representation of one's own and others' mental state. The term "theory of mind" was used to explain the human ability to predict his/her and others' behavior.³⁰ The term "theory of mind" was introduced in 1978 by Premack and Woodruff in an article entitled "Does the chimpanzees have a theory of mind?".³¹

Impaired theory of mind can be a sign of vulnerability to psychosis. But, there are few studies on theory of mind in bipolar disorder. Often patients with bipolar disorder have been studied as a clinical control group in studies on schizophrenia.³²⁻³⁵ Kerr et al.²⁴ showed impaired theory of mind in 20 patients with bipolar and 15 with depression disorder, along with 13 improved patients with bipolar disorder and a control group. Inoue et al.²⁵ studied 50 patients with improved mood disorder and 50 healthy subjects and discovered an emotional impairment in patients.

Studies of people with bipolar disorder on tasks of theory of mind have revealed a conflicting pattern of poor and impaired performance^{15,24-26} which may change according to mood state and partly to cognitive resources needed to perform the task.³⁶

Recent studies have shown impairments in theory of mind in affective relapses in bipolar disorder. A study investigated the relationship between theory of mind and a previous history of psychotic symptoms in bipolar disorder and reached the conclusion that the theory of mind function was significantly reduced in both patient groups with bipolar disorder with and without a history of psychotic symptoms

compared to normal control group.³⁷ Researchers studied theory of mind and facial emotion recognition variables in patients with bipolar type I and type II disorder and normal controls. They found that patients with both type of bipolar disorder have impairments in theory of mind and in recognizing scary faces tasks compared to controls.³⁸

Considering the above facts, current study aimed to examine the theory of mind and emotion regulation in normal subjects and patients with bipolar disorder. Thus, according to theoretical bases and research findings, the following hypotheses were formulated and studied: 1- Theory of mind in individuals with bipolar disorder is impaired compared to normal subjects. 2- People with bipolar disorder use emotion suppression strategies more frequently than healthy individuals do.

Methods

Study population and sample

This was a qualitative-controlled study. The study population consisted of all inpatients with bipolar disorder in Razi hospital of Tabriz, Iran, from 03/2012 to 03/2013, and the control group was selected among staff of the University of Tabriz. Using convenience sampling method, a sample of 40 subjects (20 patients with bipolar disorder and 20 normal subjects) was selected.

Patients were selected among hospitalized patients in Razi hospital with a semi-structured interview based on the criteria of the Diagnostic and Statistical Manual of Mental Disorders fourth edition (DSM-IV-TR) by researchers and the attending psychiatrist.

Inclusion criteria were: male gender, age range of 25 to 45 years and a minimum of reading and writing literacy. Exclusion criteria were: any history of neurological disease or severe head trauma leading to loss of consciousness, substance-related disorders and history of psychosis.

The mean age was 33.4 and 34.7 years, in healthy subjects and patients, respectively.

Finally, for data collection two scales were administered to both groups to complete: Reading the Mind in the Eyes Test and Emotion Regulation Questionnaire.

Reading the Mind in the Eyes Test

To assess theory of mind" the revised computer version of Reading the Mind in the Eyes Test³⁰ was used. The revised test form (36-item form) contains photos of the eyes of the male and female actors. Each item is described by four states of mind (a goal state and three irrelevant states with the same emotional value). Subjects are asked to choose a word that best describes the thought or feeling of the eyes by using only visual information. Each correct answer scores one point and the range is between 0 and 36 points. A score between 22 and 30 indicates moderate theory of mind, less than 22 indicates a low theory of mind and above 30 indicates high theory of mind. The Cronbach's alpha coefficient is 0.73 for this test.³⁰

Gross and John Emotion Regulation Questionnaire (ERQ)

This questionnaire is developed by Gross and John³⁹ with 10 items and two subscales that include: a) emotional suppression and b) emotional reassessment. Subjects respond to each item based on a seven-point Likert scale from "strongly agree" to "strongly disagree". Scores on this scale range from 10 to 70. The internal consistency for factor of emotional inhibition has yielded alpha coefficients of 0.73, 0.68, 0.75 and 0.76 during four different administrations, respectively. The test-retest reliability of this scale was 0.96 after three months.³⁹ In current study, the internal consistency of the questionnaire was 0.60 and the reliability was 0.63 in bisection method.

Results

Table 1 shows descriptive data of the mean and standard deviation in patient and control groups. As can be seen, in the bipolar group, mean theory of mind was 12.95, emotional suppression was 19.40, reassessment was 28.75, and overall score of emotion regulation

was 24.07. In healthy subjects these means were 20.70, 19.40, 28.75 and 21.60, respectively.

Results of multivariate analysis of variance (MANOVA) are presented in table 2. As is seen, in the theory of mind ($P < 0.001$) and suppression f ($P = 0.023$) there was a significant difference between patients with bipolar disorder and healthy individuals. But there was no significant difference in scores of reassessment and overall score of emotion regulation between the two groups. Patients with bipolar disorder achieved lower scores on theory of mind and higher scores on suppression compared to the control group. Thus, patients had impaired theory of mind and more emotion regulation problems compared to controls.

Discussion

One of our study findings was that patients with bipolar disorder had deficits in theory of mind compared to healthy subjects that is consistent with the findings in other studies.^{24,25,27,30,37} Recent studies have shown deficits in theory of mind during affective relapses of bipolar disorder. One study examined the relationship between theory of mind and a previous history of psychotic symptoms in bipolar disorder and reached

the conclusion that the theory of mind was similar in both patient with bipolar disorder groups with and without a history of psychotic symptoms and that in both cases, this function was significantly reduced compared to the normal control group.³⁷ The other study specifically designed to assess theory of mind in bipolar patients reported that both patients with bipolar disorder and depression have deficits in theory of mind while patients in remission had a function comparable to healthy controls.²⁴ Most recent studies have shown deficits in tasks of theory of mind in patients with bipolar disorder.^{25,27,30,37}

Another finding in our study indicated that patients with bipolar disorder had impairments in emotion regulation compared to normal individuals and used suppression strategy more frequently. This finding is consistent with the findings in other studies.^{9,28,40-42} Specific predictions about the abilities of patients with bipolar disorder to do cognitive adjustment strategies may reflect known neuropsychological and neuropathological deficits. For example, the ability to produce and maintain alternative interpretations of emotional stimuli involves manipulation of emotional information in working memory, and may also involve

Table 1. Mean and standard deviation of theory of mind, suppression, reassessment and overall score of reassessment and suppression of the two studied groups

Variable	Group	Number	Mean	Standard deviation
Theory of mind	Healthy	20	20.70	1.89
	Patients with bipolar disorder	20	12.95	2.60
Suppression	Healthy	20	15.70	3.52
	Patients with bipolar disorder	20	19.40	5.61
Reassessment	Healthy	20	27.50	3.88
	Patients with bipolar disorder	20	28.75	5.99
Overall score	Healthy	20	21.60	2.88
	Patients with bipolar disorder	20	24.07	5.03

Table2: Results of multivariate analysis of variance in Patients with bipolar disorder and healthy individuals

Variable	Dependent sum of squares	Degrees of freedom	Mean of squares	F	Level of significance
Theory of mind	600.62	1	600.62	115.76	< 0.001
Suppression	136.90	1	136.90	6.23	0.023
Reassessment	15.62	1	15.62	0.61	0.439
Overall score	61.25	1	61.25	3.64	0.064

higher cognitive abilities such as long-term memory and imagery.⁴²The role of automatic attention orientation toward emotionally significant material in emotion regulation is important to produce emotional responses in both central and autonomic nervous systems and affects higher levels of cortical processing. Disturbance in attention,⁴¹ executive functioning,^{9,27,28,40,43} and autonomic responses to emotional stimuli^{33,44} in patients with bipolar disorder may contribute to the early stages of dysfunction in emotion regulation.

More specifically, reassessment focuses on situations needing the ability to produce alternative explanations for emotional events, and people should keep in mind the alternative assessment during retrieval of stimuli. The fundamental difficulties to do reassessments focused on situations in patients with bipolar disorder may be related to their impaired ability to understand others' points of view, failure in inhibition of emotional stimuli^{33,44} and biases of selective attention mechanism.^{24,45,46} In contrast, it is shown that in normal subjects, use of reassessment strategies to regulate negative affect employs medial prefrontal cortex (MPFC) in a different manner.⁴² In bipolar patients, this ability may be eliminated due to an inability to inhibit the initial assessment of emotional events such as the ability to

understand other people's points of view with respect to emotional situations.⁴⁰

This study had some limitations among which we may consider the followings: First, due to lack of access to female patients with bipolar disorder in this study, only male patients were studied. Second, for evaluate the theory of mind and emotion regulation, self-reporting tools were used and there is always the possibility of bias. And third, the study was conducted on people aged 20-45 years, so the results cannot be generalized to the entire population.

Conclusion

This study compared the theory of mind and emotion regulation in patients with bipolar disorder and normal individuals and the results indicates that bipolar patients have impaired theory of mind compared to normal controls and use emotion suppression strategy more frequently.

Conflict of Interests

Authors have no conflict of interest.

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