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Theory of mind, empathy and moral emotions in patients with affective disorders

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Summary

Aim of the study. The aim of this paper is to present the selected aspects of social functioning of persons with diagnose of bipolar disorder (BD) or major depressive disorder (MDD). The main focus is on analyzing the functioning of theory of mind, empathy and moral emotions among groups of patients. Considerations also apply the possible mechanisms underlying the impairments of mentioned areas.
Material and methods. The analysis of present literature related to the subject.
Results. There are a lot of studies confirming the presence of handicap of theory of mind, empathy and moral emotions in patients with affective disorders.
Conclusions: Disturbances of social cognition and moral emotions are common among persons with BD or MDD. Raising awareness of the problems affecting this area may contribute to a better understanding of patients and help the clinicians in conducting effective therapy.

bipolar disorder / major depressive disorder / theory of mind / empathy / moral emotions

AFFECTIVE DISORDERS AND SOCIAL FUNCTIONING

One of the most characteristic symptoms of affective disorders – both bipolar disorder (BD) and major depressive disorder (MDD) - is impaired social functioning. According to numerous studies, deterioration in this area is present not only in acute episodes of the disease, but also in periods of remission [1, 2]. What is varied between episodes is, however, the severity of these disturbances and their specificity. For example, in an episode of depression often there is an increased tendency to feel shame and guilt [3 - 5], while in (hypo)mania aggressive behaviors and intensified propensity to ignore their negative consequences can appear [6, 7]. Period of euthymia casts more doubts among researchers, but many of them emphasize the persistence of certain trends (emotional, cognitive and behavioral) characteristic for the patients not only during acute episodes, but also in remission. Some of them can be therefore understood in terms of personality or temperament traits. Reference is made, for example, to impulsivity, sensation seeking and tendency to risky behavior in case of BD [8], and to the suppression of emotions and low sociability in MDD [9, 10]. There are several particularly important features of human emotional and cognitive functioning which are really worth discussing in the context of above considerations. They are presented below.

THEORY OF MIND (TOM)

The concept of theory of mind was introduced to psychology by Premack and Woodruff in 1978. For authors, it meant a certain innate and universal ability to attribute mental states both to

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self and to others, which enables us to understand and predict behaviors [11]. In other words, by having developed ToM, we can notice and - to some extent - understand the thoughts and emotional processes that occur in us and in the people around us, perceive the interactions of these processes and their possible impact on behavior. ToM is therefore a valuable skill responsible for our conscious functioning among others and its impairment can be directly translated into difficulties in coping in the social world [12 – 14]. It should be noted that theory of mind is not a homogeneous construct. According to one of the divisions, there can be distinguished two components of ToM: (1) cognitive (which consists of attributing beliefs) and (2) emotional (attributing emotions and desires) [15]. Another conception points to two fundamental aspects of mentioned ability: (1) decoding the mental states on the basis of perceived clues (such as tone of voice, body posture or mimic expression) and (2) reasoning about these states, which is made possible by the integration of both contextual information about the person and information drawn from the history (for example her/his specific experience, knowledge and attitudes), and is intended to understand her/his behavior [16].

THEORY OF MIND IN MOOD DISORDERS – BIPOLAR DISORDER

There are many scientific reports showing the inefficiency of theory of mind in people suffering from bipolar disorder. Most of these studies have focused on a group of patients with BD as a whole. The profile of social cognition shaping during the course of three phases of the disease and the nature of its changes remain vaguely defined. An important contribution to this topic was made by Cecilia Samamé [12], who reviewed more than 50 studies (from the years 1990-2012) comparing the quality of social cognition of bipolar patients and healthy volunteers. The review identified a number of important issues: (1) in the first of these groups we can observe deficits in emotion recognition and in ToM (see also: [17 – 19]), (2) these deficits are present during each of the phases of the disease: in (hypo)mania, depression and euthymia, and (3) difficulties in performance of certain tasks measuring ToM (and some structural changes in the brain, which may be their biological substrate) are observable both in the group of euthymic bipolar patients and in healthy individuals with increased risk of developing BD (because of family history). Very interesting study was conducted by Lindsay Schenkel and her team [20]. The scientists attempted to systematically explore the multidimensional approach of ToM by examining its functioning in the very young (pediatric) patients suffering from bipolar I or II disorder. Additionally, they wanted to see how the ToM deficits affect the real psychosocial disturbances in the functioning of the subjects. The study showed that BD I is associated with more impaired psychosocial functioning in comparison to BD II. Among particularly affected capabilities there are: (a) recognition of others' mental states based on observable premises and (b) understanding and prediction - based on contextual clues - other people's behavior. Another study, conducted by Sandra Baez and her colleagues [21] showed that patients with BD have difficulties in recognizing facial expressions of negative emotions. Furthermore, in the task testing sensitivity to observed suffering of another person (so called *empathy for pain*), people with BD had subtle difficulties in distinguishing such situations in which someone's suffering was a coincidence of circumstances, from situations in which pain was inflicted intentionally. The authors, based on the results of their research, have postulated that patients with BD have ability to draw conclusions about the intentions of others limited to some extent.

No less interesting data is provided by representatives of neuropsychology. The key finding of neuropsychological studies conducted nowadays is showing the fact that the deficits associated with emotional processing and ToM are present even in euthymic patients, suggesting that they could be included in the payment of BD's endophenotypes [12]. However, drawing conclusions on this topic requires some caution: it turns out that the results are largely dependent on what aspect of ToM was measured, and what tool was selected for this purpose. Many studies, in which the functioning of ToM in remitted subjects was measured using verbal tasks, indicated the moderately or highly severe dysfunction in the area of reading other people's mental

states. On the other hand, in cases where the investigators used the *Reading the Mind in the Eyes Test* [22] (which relies on the recognition of emotions presented in photographs depicting human eyes), the observed dysfunctions were very small - sometimes non-significant. This is due to the fact that ToM is not a single construct, but a diverse set of processes, each of which can be in a different extent affected by the specific nature of BD. Therefore, ToM should not be considered in terms of the ability that subject has a hundred percent or does not have at all, but rather in terms of continuum [12]. The sources of valuable data on the impact of BD on ToM, are studies of neuropsychological abnormalities (constituting a potential biological substrate of disturbances of ToM) in patients' first-degree relatives. The functioning of healthy relatives is not modified by long-term use of drugs, the incidence of acute symptoms of the disease and its chronicity, therefore it can provide a reliable overview of the mechanism of BD [12]. An interesting research in this paradigm was conducted by a group led by Jane Whitney [13]. Their aim was to determine the differences in socio-emotional processing and functioning between very young people at high risk of BD (having a diagnosed parent and subtle mood disorders, but not fully developed BD) and healthy controls, without genetic load. It was observed that the group of subjects with an increased risk of developing bipolar disorder is characterized by significant abnormalities in social functioning, concerning, among other things: social awareness, social cognition and communication skills. There were no significant differences in the functioning of ToM and recognition of emotional expressions between the two groups.

THEORY OF MIND IN MOOD DISORDERS - MAJOR DEPRESSIVE DISORDER

In the group of patients with a diagnosis of major depressive disorder some deficits in theory of mind have also been observed. There is a growing interest in the hypothesis that impaired social cognition in depressive patients (which include, inter alia, ToM) may be a factor contributing to the difficulties in psychosocial functioning frequently occurring among them [23]. Undoubtedly, the processing of information about the social world can be distorted under the influence of person's emotional state: our conclusions about the social world are often consistent with our mood [23].

Sample research illustrating deficits in ToM associated with depression, was conducted by a team of Morten Kaletsch [24]. The study was attended by 30 depressed inpatients and 30 healthy volunteers. The subjects watched the movie about social interactions - their task was to recognize emotions expressed by the actors and to assess their confidence that they discerned them correctly. It was observed that patients perceive in the presented interactions more negative emotions than healthy controls. What is more, they evaluated the interactions, in which negative emotions were present, as more intense, and were then more confident in their evaluations. Authors of another interesting research are Wolkenstein and his colleagues [25]. In the first part of their study, the participants were asked to complete the *Reading the Mind in the Eyes Test.* It turned out that there was no difference between the group of depression patients and a group of healthy subjects in the overall accuracy of emotions recognition. Researchers demonstrated, however, a relationship between the "group" (depressive / healthy) and "stimulus valence" (positive emotion / negative emotion / neutral expression): patients identified negative emotions more accurately than the control group. Moreover, people with depressive symptoms were characterized by reduced ability of rational social information processing (shown in the film which was presented in the second part of the study) and drawing conclusions about the mental states of the involved characters. Attempts were also made to look at the relationship between the intensity and specificity of depressive symptoms and the ability to decode mental states [26]. Regardless of the severity of the disease (mild or moderate and severe depression), all examined patients received a similar average number of correct answers in the *Reading the Mind in the Eyes Test*, although the difference between the results of people with mild or moderate depression and the control group did not reach statistical significance (the first group was characterized by a large variety and range of results). Quite different data was obtained in a

study conducted a bit earlier [27], where people having some *subclinical* symptoms of depression achieved significantly *better* results in the *Reading the Mind in the Eyes Test* than those in the control group. Similarly, the authors of another research [28] demonstrated that although developed depressive disorder may adversely affect the ability of the individual to draw conclusions about the emotional state of another person (affective ToM), the mild symptoms of depression or anxiety - not in line with the clinical severity - can support this capability. Interestingly, the reduced efficiency of ToM is also seen as a risk factor for recurrence of symptoms of depression in euthymic patients. For example, the authors of certain study [29] showed that more than half of the people, who have obtained results indicating the presence of the deficit in ToM, had a recurrence within a year of the study.

EMPATHY

Like ToM, empathy consists of two components: cognitive and emotional (affective). Cognitive dimension of empathy is understood as the ability to imagine or understand the mental states of other people (some authors equate this dimension of empathy with ToM – [15]), while the emotional component - as the ability to respond to the emotional states of others. Emotional response, which may be classified in the payment of reaction resulting from affective empathy, is one that is adequate to another person's mental state, which caused this reaction [30]. We cannot, for example, consider to be empathetic the reaction of satisfaction in reply to someone's failure or the reaction involving the desire to help motivate only by unpleasant sensations caused by watching someone else's suffering. What distinguishes the response associated with our own negative feelings from truly empathic reaction is focus on our own experiences rather than on other people [30].

EMPATHY AND AFFECTIVE DISORDERS

There are many studies showing that patients with bipolar disorder fall worse than the group of healthy individuals in tasks measuring such elements of empathy as recognition of emotions, perspective-taking and emotional reactivity [31]. Moreover, people with a diagnosis of BD often describe themselves as less empathic, low assess their ability to adopt the perspective of others and empathic concern [31]. Interesting results on this subject were contributed by Eva-Maria Seidel and her co-workers [32]. The authors defined empathy as a complex competence, involving not only understanding of the emotions of others, but also understanding and regulating own emotional experiences. In the study designed to look at both mentioned empathy aspects in persons with BD it was demonstrated that the ability to take emotional perspective does not significantly differ between the group of patients in euthymia and a group of healthy volunteers, although patients needed more time to perform the task testing this skill. It was also observed that drawing the conclusions concerning emotions, which are accompanied by social context, seems to be easier for patients than recognizing emotions solely on the basis of facial expressions. Importantly, there was a significant correlation demontrated between the severity of residual symptoms of mania or depression and the intensity of the difficulty of perspective-taking on an emotional level). This suggests that the ability of compassion is dependent on the current emotional state of the individual and may vary with changes in the symptoms. The last of the conclusions made by the Eva-Maria Seidel and her colleagues [32] says that patients with BD have impaired ability to identify and predict the emotions that they would experience if they were in some situation, described to them by researcher during the test.

Studies conducted with the participation of people suffering from major depressive disorder showed that they also have some dysfunctions of empathy - at least in the acute phase of the disease. For example, in an experiment of Fujino et al. [33], patients with depression attributed less negative value to the stimuli associated with pain (these were scenes from the movie of the hand needle puncture) than healthy controls. On this basis, the authors suggest that depressive patients may have troubles with understanding the emotions of others. In another study [34] there was the additional factor highlighted that may modify the functioning of em-

pathy, which is severity of disease's symptoms. This research was attended by persons in complete remission, persons with subclinical intensity of symptoms, patients with moderate depression and a control group. The authors found that depressive patients have more difficulties in perspective-taking than healthy subjects and exhibit less empathic concern, which contradicts the results of previous studies in which people with depression and the control group received similar values point in the scale measuring the tendency to empathic concern [35]. It therefore appears that the level of mentioned empathy index can fluctuate and vary depending on the course of the disease [34]. It was also found that the burden of depression (for example by its multiple recurrences) is negatively correlated with the capacity to take someone else's perspective, however neither the level of cognitive, nor affective empathy was influenced by the severity of symptoms at the time of the investigation [34]. It is worth noting that there are reports in which such a relationship has been demonstrated [36], what points to the fact that this area requires further exploration.

A broad overview of research on the functioning of empathy among patients with MDD was made by Schreiter and his colleagues [37]. It follows that: (1) depression is often associated with enhanced discomfort that arises in response to observed suffering of others (it is so called *personal distress* or *empathic stress*), (2) depressed subjects usually do not differ from healthy persons in terms of the manifestation of empathic concern, but (3) they more often have deficits of cognitive empathy. In summary, according to mentioned meta-analysis, both aspects of empathy - affective and cognitive – may be subjects to some changes with the emergence of symptoms of depressive disorder.

In the light of the above considerations, the question arises: is there a genetic background of social behavior's impairment in MDD? A large number of studies that investigate the issue of the potential genetic basis of social and moral behavior concerning depressed patients is devoted to the importance of polymorphism of the 5-HTTLPR gene [38]. According to Ahmad Hariri and his colleagues, this polymorphism seems to have a significant impact on the functioning of the amygdala (a structure of the limbic system), and - as a result - it affects some of the basic mechanisms involved in the processing of negative emotions. [39]. This finding allows concluding that mentioned differences in the genotype of individuals will manifest itself in a diverse emotional reactivity and in differences in susceptibility to stress [40]. In the long run, persons with the "worse" combination of alleles may have increased risk of developing depression, by a lower resistance to stressful events. What is important, authors of some of the recent research found that polymorphism 5-HTTLPR gene not only modulates mood, but it can also affect - to some extent - the process of moral decision-making [38, 41], therefore it significantly influences our social functioning. Interestingly, serotonin (neurotransmitter, the operation of which is encoded by described gene) seems to play an important role in the regulation of social behavior of different species, not just of people [38]. For example, it was observed that the anti-social and aggressive behavior is associated with low levels of serotonin, while the intact (or even increased) activity of the serotonergic system is a prerequisite for pro-social behavior [42, 43]. There is evidence that enhancing the activity of serotonin system (by administering SSRI to patients with depression) modulates empathic responses to observed harm of another person, and that this effect is stronger in people who have a high level of empathy as a trait [44]. In other words, appropriate level of serotonin is necessary to keep the level of empathy and functioning of other moral emotions (described below) untouched.

MORAL EMOTIONS: GUILT AND SHAME

Moral emotions are those that are induced in the context of compliance with accepted rules or violation of them. They indicate to us the moment at which we exceed certain standards and help us to inhibit socially unacceptable reactions [45]. The group of most important feelings of this type includes, among others, empathy described above (although for the purpose of this study, a broader definition of this construct has been adopted, which contains both affective and cognitive aspects of empathy), and next to it - a sense of guilt and shame [46, 47]. It is believed

that guilt usually arises in the context of social exchange between the subjects of interaction, when one of them feels that they caused harm to another [46], while shame is not limited to a particular situation, but stems from a sense that the whole personality of the individual is morally wrong [5, 46]. Some researchers point out that both of these emotions involve different types of behavior: guilt is associated with a tendency to repair the caused harms, and the feeling of shame - with avoidance or aggression [48].

MORAL EMOTIONS IN AFFECTIVE DISORDERS

Among the studies of moral emotions in patients with affective disorders, those that describe the issues of major depression outweigh. Reports on bipolar disorder tend to focus more on the behavior associated with crossing of standards than on the feelings, although some of them also refer to the emotional mechanisms. For example, Fletcher and his team [49], in an attempt to explore and describe the expression of the risky behavior of hypomanic bipolar patients, asked their subjects whether they had a sense of guilt after spending large amount of money. The statements of patients confirmed that their mood worsened when they realized that their behavior was inappropriate. An important limitation of the study cited above (which is pointed out also by its authors) is the fact that at the time of the research, patients underwent an episode of depression, which could significantly affect their responses. A study directly referring to guilt and shame in patients with affective disorders (BD and MDD) was conducted by Highfield et al. [50]. Researchers observed that patients with recurrent depression have a higher tendency to feel shame than bipolar subjects, and that among all patients with affective disorders this tendency is significantly stronger than in the control group. A very interesting study was conducted by Zahn and his colleagues [51]. Researchers noted that increased tendency to blame ourselves and reduced - to apportion blame to others, may be associated with susceptibility to depression. Similar conclusions were drawn by the team of Green [52], postulating that not only the dominance of negative emotionality, but a certain imbalance in this area (between the tendency to blame ourselves and the tendency to blame other people) can be a predictor of the development of a depressive episode.

SUMMATION

To summarize the above descriptions of the constructs included in the analysis: theory of mind, empathy and selected moral emotions, it is worth noting that the knowledge of specifics of each of them in individuals struggling with affective disorders, can help: (1) to understand the mechanisms behind their - often disturbed - social functioning, and thus - (2) to better understand some of the reactions of patients, and, according to some studies [29, 51, 52], (3) to estimate the risk of first appearance or recurrence of disease's symptoms. Hence, conducting research moving this subject seems to be significant both for the sake of science and clinical practice.

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