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Review / Meta-analyses

Functional outcome and social cognition in bipolar disorder: Is there a connection?

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ABSTRACT

Background: Interest in social cognition in bipolar disorder (BD) has increased considerably over the past decade, with studies highlighting major impairments, especially in mental state reasoning, even during euthymia. A causal relationship between social cognition deficits and social functioning has already been established in individuals with schizophrenia, but there is still little information about links between social cognition and social functioning in BD. Our aim was therefore to review the relationship between functional outcome and social cognition in patients with BD.
Methods: We conducted a systematic review of the literature. Relevant articles were identified through literature searches in the MEDLINE/PubMed, EBSCOHost and Google Scholar databases for the years 2000–2017, using the keywords *bipolar*,*social cognition*, *theory of mind*, *mentalizing*, *emotion recognition*, *emotion processing*, and *functioning*. A total of 20 studies met our inclusion/exclusion criteria.
Results: We found that functioning was significantly correlated with three domains of social cognition (ToM, emotion processing, and attribution bias). Twelve of 13 studies reported a correlation with emotion processing, but a correlation with ToM was only found in three of the 11 studies that assessed it. Six studies found an effect of depressive symptoms on emotion processing and no significant association was found with manic symptomatology.
Conclusions: To the best of our knowledge, the present review is the first to specifically explore the relationship between social cognition and social functioning in patients with BD. This exploration is of interest, as it enhances current understanding of this disorder and, by so doing, should improve patient outcomes.

1. Introduction

Bipolar disorder (BD) is reportedly the sixth leading cause of disability worldwide [1]. It is a chronic psychiatric disease characterized by considerable mood instability, with periods of expansive mood alternating with periods of depressive mood. It causes severe behavioral, relational, social and familial problems [2,3].

It has already been established that patients with BD have fewer social interactions and more restricted social networks than healthy individuals [4]. The psychosocial disability resulting from BD is extensive, and encompasses multiple domains, including work and social interactions, independent living in the community, family adjustment, mortality, and quality of life [5]. In a review conducted by MacQueen et al. [6], 30–60% patients with BD had detectable levels of social impairment, occurring in both occupational and social domains, whether or not they had interepisode symptoms. The factors that contribute to psychosocial impairment in BD may be interlinked, creating an effect of functional decline [7].

Among the most common clinical factors associated with impaired social functioning are episodes of depression [8] or subsyndromal depressive symptoms [9,10]. These have been significantly associated with impaired work, family and social life [8]. By contrast, changes in the severity of mania or hypomania have not been consistently associated with variations in social functioning [11].

Research on the functional outcome in BD has uncovered several factors besides mood symptoms that exacerbate psychosocial disability over the course of the illness, including genetics, illness severity, stress, anxiety, and cognitive impairment [7]. Some studies have found a specific relationship between poor functional outcomes in patients with BD and aspects of cognitive impairment

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[5,12]. Cognitive performances (executive function, verbal learning and memory, attention, processing speed) have been associated with patients' level of functioning in both the short and long term [13,14]. In a longitudinal study, Burdick et al. [12] concluded that cognitive impairment should be treated as a different dimension from residual or persistent depressive features. They also advocated regular assessments of cognitive status as well as mood symptoms in future studies of functional outcome.

One aspect of cognition that is particularly worth exploring is social cognition. Social cognition is defined as the aspect of cognition that is dedicated to processing social information for adaptive functioning [15]. More specifically, it refers to an intricate set of higher-order neuropsychological domains that allow for adaptive behaviors in response to others [16]. Four dimensions are usually included in this construct: theory of mind (ToM), emotion processing, social perception and social knowledge, and attribution bias [17]. In BD, impairments with medium effect sizes are observed in social cognition [18,19]. Significant ToM dysfunctions, but with modest effect sizes, have been observed in BD, in both remitted and subsyndromal patients, with a greater deficit during acute episodes [18].

There has been abundant research on social cognition in schizophrenia. These studies have revealed that patients exhibit a significant ToM impairment with large effect sizes [20,21]. This impairment remains significant regardless of the type of task used, and persists even during remission [20,22,23]. Various areas of social cognition (emotion perception, social perception, attributional style, ToM) have been identified as independent correlates of social functioning in schizophrenia [24], and a causal relationship between social cognition deficits and social functioning has been already established in patients [25]. By contrast, there is a surprising dearth of studies assessing the relationship between baseline social cognition and concurrent baseline social functioning in BD populations.

We set out to provide a comprehensive overview of the relationship between social functioning and social cognition in patients with BD. To the best of our knowledge, this was the first systematic review of the available literature on the subject. The aims were a) to gain an overview of the association between social cognition and functional outcome in BD, b) to explore if this association is present at the different clinical phases of BD, and c) to identify possible gaps within the present literature and directions for future research.

2. Materials and methods

2.1. Search strategy and selection criteria

We conducted a systematic review and data extraction of the published literature in accordance with Preferred Reporting Items for Systematic Reviews and Meta-analyse (PRISMA) guidelines [26], to identify studies of the relationship between social cognition and social functioning in BD. Relevant articles were identified through literature searches in the MEDLINE/PubMed, EBSCOHost, Scopus and Google Scholar databases and, as the exploration of social cognition in bipolar disorder has been developed in the early 2000s, we restricted our search strategy to the period between January 2000 and October 2017. We used eight keywords (*social cognition*, *theory of mind*, *mentalizing*, *emotion recognition*, *emotion processing*, *social perception*, *social knowledge*, and *attribution bias*) for the social cognition component, and two keywords (*social functioning*, *functional outcome*, *quality of life*) for the functioning component; associated with the term bipolar. The reference lists of the articles we retrieved were also individually explored to look for other relevant reports. We personally contacted the authors of two articles in order to obtain publications that were not available through our university library.

2.2. Inclusion and exclusion criteria

We only selected articles that were available in the English language. Their titles and abstracts were reviewed to determine whether they met the following additional methodological criteria: (1) BD I or BD II population; (2) at least one social cognition task and one functioning scale; and (3) search for a possible connection between social cognition and functioning in BD. As shown in Fig. 1, we initially identified 339 titles and abstracts, but only 20 studies met all the eligibility criteria and were thus included in our review.

2.3. Data extraction

After duplicate publications were excluded, the first author (MV) screened all the remaining abstracts. In case of indistinctness, full texts were consulted. Two independent reviewers (MV, DRC) read the full text and all ineligible papers were excluded. Disagreements between the reviewers were discussed and resolved during consensus meetings. Information for each eligible study was extracted and tabulated. Extracted data included sample characteristics, method for assessing BD diagnosis, BD type, relevant measures, and main findings. The extraction process was completed independently by MV and checked by DRC.

2.4. Brief listing of the tasks and scales used

2.4.1. Social cognition tasks

The different tasks used in the studies we included are listed in Table 1. Facial emotion recognition was explored through sets of pictures of facial expressions that had to be labeled. The most commonly used ToM tasks were Reading the Mind in the Eyes Test (RMET; [27]) and the Faux Pas Recognition Test [28]. In the RMET, individuals are instructed to look at a series of photographs of just the eye region of the face, and decide which word out of four best describes what the person in the photo is thinking or feeling. Faux pas recognition involves recognizing faux pas in a series of short stories. We also noted various versions of false-belief and intention tasks. Only two studies assessed attribution bias. Participants first had to complete a questionnaire describing various situations, after which they were asked to devise an explanation for why each situation had occurred. Social perception and social knowledge were not specifically assessed.

2.4.2. Functional outcome scales

The most consistently used scales were the Global Assessment of Functioning (GAF; from DSM-IV-TR; [29]), the Functioning Assessment Short Test (FAST; [30]), and the Social Adjustment Scale Self-Report (SAS-SR; [31]).

The GAF is used to assess patients' overall functional status across psychological, social and occupational domains, via a single anchored measure. With a range extending from positive mental health to severe psychopathology, it is intended to be more of a generic scoring system than a diagnosis-specific one. It has the advantage of being simple to use [32].

Another well attested functioning assessment tool is the FAST [30], which was used in four of the 19 articles included in the review, either on its own or with the GAF. The FAST scale probes six functional domains: financial, interpersonal, leisure, autonomy, occupational and cognitive functioning. The six separate dimensional scores are summed to produce an overall functionality score.

The SAS-SR [31] assesses a broad range of social domains, focusing on more specific subjects such as work/school role, social/leisure activities, relationship with extended family, marital role, parental role and membership of a family unit.