



Mentalizing in first-episode psychosis

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ARTICLE INFO

Article history:

Received 9 December 2010

Received in revised form 7 October 2011

Accepted 11 October 2011

Keywords:

Recent-onset
Schizophrenia
Mentalizing
Theory of mind
Social cognition
Emotion recognition
Social knowledge

ABSTRACT

Mentalizing deficits have often been observed in people with schizophrenia and a few recent studies suggest that such deficits are also present in patients with first episode psychosis (FEP). It is not clear, however, whether these mentalizing deficits in FEP can be accounted for by underlying processes such as social cue recognition, social knowledge and general reasoning. In this study, we assessed mentalizing abilities in 31 people with FEP and 31 matched controls using a novel, comprehensive mentalizing task validated through the present study. We also assessed social cue recognition, social knowledge and non-social (or general) reasoning performance in the same participants in order to determine if the mentalizing deficits in FEP can be at least partly explained by performance in these three underlying processes. Overall, the mentalizing task revealed the greatest impairment in FEP, an impairment that remained significant even after controlling for social cue recognition, social knowledge and non-social reasoning performance. Interestingly, non-social reasoning and social knowledge were both shown to contribute to mentalizing performance. In addition, social cognition measures were linked to social functioning in the FEP group, with the strongest correlation observed with mentalizing performance. Taken together, these results show that mentalizing is an aspect of social cognition that is particularly affected in FEP and might contribute to functional impairments in these patients. These deficits could be a prime target for cognitive remediation in FEP, and our results suggest that this could be done either directly or through improvement of related social and non-social cognitive skills such as social knowledge and general reasoning.

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1. Introduction

Social cognition can be defined as a group of processes that allow people to understand and interact with each other. The ability to attribute mental states to others, often referred to as mentalizing or theory of mind, is an important aspect of social cognition. In mentalizing tasks as in real life, mental states such as intentions, beliefs, knowledge or emotions are attributed based on all available sources of information about the person to whom these mental states are to be attributed and about the context in which that person evolves. Mentalizing judgments thus involve integrating several pieces of information in order to infer the appropriate mental state.

People with schizophrenia (SZ) generally present with important impairments in their ability to mentalize, i.e., to infer the mental state of a character presented in a given situation. Mentalizing deficits have been repeatedly reported in people with SZ (Sprong et al., 2007; Bora et al., 2009), along with other neurocognitive impairments (Heinrichs and Zakzanis, 1998), and it is now well established that

these deficits have a significant negative impact on social functioning and the quality of life of patients with SZ (Green, 1996; Green et al., 2000; Couture et al., 2006). However, most studies of social cognition in SZ have included patients in a chronic stage of illness and/or during active psychotic episodes (Sprong et al., 2007; Bora et al., 2009), and the mentalizing deficits observed in these patients could thus be linked to biases towards the recruitment of patients with a more chronic course of illness and a poorer outcome, effects of long-term medication use, transient perturbation due to positive symptoms, etc. In an attempt to address some of these biases, a few studies have measured mentalizing in remitted SZ patients, again revealing significant deficits in these patients, though of a lesser magnitude than those observed in acutely psychotic patients according to a recent meta-analysis (Bora et al., 2009). These studies in remitted patients suggest that mentalizing deficits represent a trait of SZ, instead of being fully linked to symptomatic states. Studies in remitted patients (e.g. Herold et al., 2002) however cannot account for the effect of long-term medication use or the long duration of psychosis and it also remains unclear when in the illness process mentalizing impairments occur. One approach to minimize the impact of illness duration, get a sample representative of diverse future outcomes and address the issue of when the deficits occur is to recruit patients early after the onset of psychosis. This is precisely what several

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studies have done and these studies have also reported mentalizing deficits in people with first-episode psychosis (FEP) (Inoue et al., 2006; Bertrand et al., 2007), in line with the suggestion that these deficits could be a general characteristic of patients with SZ. The first FEP study on mentalizing by Inoue et al. (2006) relied on a single cartoon story in which three mentalizing questions were asked. This simple task revealed a greater percentage of patients than controls who responded incorrectly to one of the three questions. In a subsequent study (Bertrand et al., 2007), a mentalizing deficit in FEP was again observed using the Hinting task (Corcoran et al., 1995), which includes ten short stories from which participants have to infer a character's intentions. Other more global measures of social cognition that likely involve mentalizing abilities have also revealed significant deficits in FEP relative to healthy controls (Bertrand et al., 2007; Koelkebeck et al., 2010). With the recent focus on early intervention, and given the relationship between social cognition and social functioning, identifying and treating these mentalizing deficits early could have a significant positive impact on the functional outcome of people with SZ.

The mentalizing deficits observed in people with SZ could however result from difficulties at different points in the information processing chain that leads to mental states attributions (see Bless et al., 2004; Brunet-Gouet et al., 2011), including the ability to recognize social stimuli (social cue recognition) (Edwards et al., 2001; Kucharska-Pietura et al., 2005; Addington et al., 2006a; Kohler et al., 2010), the ability to construct and retrieve social representations (social knowledge/memory) (Cutting and Murphy, 1990; Addington et al., 2006b; Kee et al., 2009) and/or general reasoning/inferential mechanisms (Young and Bentall, 1997). The aims of the current study were thus 1) to replicate the results of mentalizing impairments in people with a FEP relative to control subjects using a novel, comprehensive mentalizing task; 2) to assess distinctively social cue recognition, social knowledge and general reasoning performance in the same two groups of participants; 3) to determine if mentalizing performance/deficits can be at least partly explained by performance in these underlying processes. These more elementary processes have not been concurrently examined in previous studies on mentalizing abilities in FEP and their assessment could provide valuable information about the pathways leading to mentalizing impairments in these patients. Since there are no standardized mentalizing tests as of yet and given that previous measures have often presented with ceiling effects and lack of sensitivity (e.g. Herold et al., 2002; Inoue et al., 2006), mentalizing was measured here with a comprehensive task developed for the purpose of this study, i.e. the Combined stories test, for which we also present initial psychometric properties.

2. Methods

2.1. Participants

Thirty-one participants with a FEP were recruited from the Clinique Notre-Dames-Victoires, a specialized outpatient clinic that offers comprehensive evaluation and treatment for young adults (18 to 35 years old) who are in the early stages of a psychosis. All patients presented with a DSM-IV SZ spectrum psychosis diagnosis (American Psychiatric Association, 1994) including SZ ($n=23$), schizoaffective disorder ($n=2$), delusional disorder ($n=4$), and psychosis not otherwise specified ($n=2$). Our decision to include patients with this range of diagnoses was based on our objective to include a sample representative of all patients with a SZ spectrum psychotic disorder and on previous reports that these diagnoses fall within the SZ spectrum when diagnoses are reassessed later in the course of the illness (Schimmelmann et al., 2005; Malla et al., 2006) or based on family studies (Kendler et al., 1995; Schimmelmann et al., 2005; Malla et al., 2006). Patients were excluded if they had a history of neurological disorder, if they presented an estimated IQ under 70 (based on the Wechsler Adult Intelligence Scale Third Edition [WAIS-III] Vocabulary and Block Design dyad; (Ringe et al., 2002)) or if they did not have an adequate understanding of French (having completed most schooling in French was considered as leading to adequate understanding whenever French was not the first language). All patients were taking a second-generation antipsychotic as their primary medication, with 17 taking quetiapine (mean dose = 770.6 mg), four taking olanzapine (mean dose = 15 mg), seven taking

risperidone either in oral (mean dose = 2.3 mg/day [three patients]) or intramuscular long-acting form (mean dose = 25 mg/2 weeks [three patients]; one patient was taking both formulations) and three taking a combination of quetiapine and another antipsychotic medication. Treatment had been initiated on average 20.9 months prior to the study (median = 13.3 months, range = 1 to 57). Though we favored patients with short illness duration (less than 24 months), we also included patients who had been followed for up to 60 months in order to get a more important sample size. Symptoms were assessed with the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987) and level of social functioning was assessed with the Social and Occupational Functioning Assessment Scale (SOFAS) (American Psychiatric Association, 1994).

Thirty-one control participants were recruited from the community through ads in local stores, local media and through word of mouth. The exclusion criteria for the control group were the same as those of the FEP group, with the additional requirement of not presenting with a psychotic disorder or a cluster A personality disorder (as assessed through a clinical interview based on the Structured Clinical Interview for DSM-IV (SCID) (First et al., 1998)), and not having a first-degree relative with a psychotic disorder. Because we wanted to recruit control participants that were otherwise as representative as possible of the general population, we however did not exclude controls that our SCID-based assessment allowed us to identify as presenting with other axis I diagnoses. The control group thus included three participants that we identified as meeting the criteria for mild to moderate substance abuse or dependence and two participants identified as meeting the criteria for a specific phobia. None of the control subjects had received a diagnosis and none reported taking a psychoactive medication to control these symptoms.

The groups were matched in terms of age, gender and parental socio-economic background (Miller, 1991). There was no significant difference in estimated IQ between the two groups (see Table 1). After a complete description of the study, all participants signed a consent form in accordance with the local ethics committee requirements.

2.2. Material

2.2.1. Mentalizing and non-social reasoning assessment

For the measure of mentalizing abilities, no standardized or validated tests are yet available and to the best of our knowledge, very few of the most widely used tests have been translated into French. Moreover, most of the available measures include a limited number of items and suffer from ceiling effects at least in the control group, which can be problematic when contrasting with the performance of a patient group. For these reasons and to increase the sensitivity of our measure, we herein used a combination of mentalizing stories that included items translated and adapted from several previous tests that are all well regarded and have been used often in the experimental psychology literature. These include the 'Hinting task' (Corcoran et al., 1995), the 'False Belief task' (Baron-Cohen, 1989; Frith and Corcoran, 1996), the 'Faux-pas test' (Baron-Cohen et al., 1999) and the 'Strange Stories Test' (Happé, 1994). These tests were targeted so as to have items that cover attributions of a full range of mental states,

Table 1
Demographic and clinical data.

	FEP	Controls	p^a
<i>Demographic data</i>			
<i>n</i>	31	31	
Gender (men/women)	26/5	26/5	
Age (mean, S.D.)	24.9 (4.5)	25.2 (4.2)	NS
SES score (mean, S.D.)	50.7 (18.2)	48.6 (14.2)	NS
SES category (mean, S.D.)	3.7 (1.2)	3.6 (1.0)	NS
Estimated IQ (mean, S.D.)	100.4 (15.1)	101.8 (10.5)	NS
Education category ^b	4.0 (1.1)	3.3 (1.2)	0.03
<i>Clinical data</i>			
PANSS positive (mean, S.D.)	15.1 (4.8)		
PANSS negative (mean, S.D.)	16.0 (5.9)		
PANSS general (mean, S.D.)	32.0 (7.0)		
SOFAS (mean, S.D.)	58.1 (12.1)		
Patient status (outpatient/inpatient) ^c	28/3		
Duration of illness in months (mean/median)	20.9/13.3		

S.D. = standard deviation.

SES = socio-economic status.

PANSS = Positive and Negative Syndrome Scale.

SOFAS = Social and Occupational Functioning Assessment Scale.

^a The demographic variables were contrasted between groups using bilateral two sample t-tests.

^b According to Hollingshead's categories, adapted for Quebec: 1 = postgraduate, 2 = bachelor degree, 3 = CEGEP degree, 4 = high school or equivalent, 5 to 7 = decreasing levels of partial high school. Note that this information was available for all control subjects but for only 21 of the FEP patients.

^c The inpatients were stabilized and about to be discharged at the time of testing.

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