Investigating the state-like and trait-like characters of social cognition in schizophrenia: A short term follow-up study

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ABSTRACT

Background and objectives: Controversial findings exist in the literature regarding the state- and trait-like characters of social cognition in schizophrenia. In order to explore the relationship of social cognition with symptom severity in the present study, Theory of mind (ToM) and emotion recognition were tested in an acute phase and later in a clinically stable phase in patients.
Methods: ToM and emotion recognition abilities were examined by using the Reading the Mind in the Eyes Test (RMET) and the Ekman 60 Faces Test (FEEST) in 43 patients with schizophrenia and 41 healthy controls. Research diagnoses were based on SCID interviews. Symptom severity in patients was assessed by the Positive and Negative Syndrome Scale (PANSS).
Results: ToM and emotion recognition deficits improved in the clinically stable phase compared to relapse, but were still found to be impaired compared to healthy controls. Negative symptom severity showed strong correlation with emotion recognition and ToM at both visits.
Conclusions: Both ToM and emotion recognition fluctuated together with symptom severity, which confirmed the "state-like" component of these abilities. Our results, taken together with the findings of previous investigations show that social cognition deficits in schizophrenia have both state-like and trait-like components.

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1. Introduction

1.1. Social cognition

The impairment of social cognition and its relationship with social functioning is well known in schizophrenia (Penn et al., 1997; Addington et al., 2006). Social cognition defines how people think about themselves and others in the social world (Penn et al., 2008). It includes all the social and emotional skills that are needed for successful interpersonal interactions (Veltro et al., 2011). Theory of mind (ToM) or mentalization, emotion recognition ability, attributional style, social knowledge and social perception are the five primary domains of social cognition (Green et al., 2008; Penn et al., 2008). Theory of mind (ToM) is the ability to attribute mental states to the self and others (Premack and Woodruff, 1978). This ability helps to represent the different mental states of others in order to deduce others' intentions, desires and thoughts. It includes understanding false beliefs, intentions, deception, hints, irony, faux pas and metaphor (Penn et al., 2008). Many studies about ToM described that patients with schizophrenia have demonstrated deficits in this ability compared to healthy and other psychiatric controls (Brune, 2005; Harrington et al., 2005; Kelemen et al., 2005; Uhlhaas et al., 2006; Shur et al., 2008; de Achaval et al., 2010).

1.1.1. Theory of mind

Some earlier investigations did not find ToM deficits in remitted patients (Pickup and Frith, 2001; Marjoram et al., 2006). The majority of recent investigations found that ToM deficits are present also in remission (see a meta-analysis by Sprong et al., 2007). The trait-like components of ToM deficits are further supported by studies that found that healthy siblings and first-degree relatives of patients with schizophrenia performed worse on ToM tests than non-relative healthy controls (Wykes et al., 2001; Irani et al., 2006; de Achaval et al., 2010), but better than patients (Janssen et al., 2003).

However, only a few studies examined ToM in a longitudinal setting. In a recent study Horan et al (2012) found that deficits in ToM are relatively stable in time, but not fully independent of symptom state: ToM impairments were present during acute and also in relatively remitted phases, but more salient during symptomatic periods. The trait features of the illness were also confirmed by Lysaker et al (2011). These longitudinal studies not only examined ToM during a longer period of time (6–12 months), but also emphasized that subjects were in a relatively stable state at all visits. Only an early study by Drury et al (1998) examined ToM in relapse and remission in the same subjects

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and found better ToM functions in remission. However, the patient population was relatively low (n = 12) in this study, which needs further confirmation. In the present investigation we aimed to study ToM deficits in different phases of the illness in a larger sample of patients with schizophrenia.

1.1.2. Emotion recognition

In the past 30 years a noteworthy number of studies found that the impairment of emotion perception among patients with schizophrenia is also a significant feature of the illness (Kohler et al., 2010). Individuals with schizophrenia show deficits in emotion recognition compared with healthy controls (Kohler and Brennan, 2004). However, Gur et al. (2002) in an emotion recognition fMRI study found no difference between patients with schizophrenia and healthy subjects concerning their emotion recognition skills on a behavioral level. Specifically, they did not find any difference between groups in discriminating emotional valence (positive versus negative). Despite the lack of difference in the emotional valence discrimination tasks, patients showed less activation in the limbic regions during emotion recognition than healthy controls. Previous studies suggest that patients in remission may perform better in emotion recognition than patients in relapse (Gessler et al., 1989; Penn et al., 2008; Rodriguez Sosa et al., 2011), while others found that emotion recognition is stable over time in schizophrenia (Bediou et al., 2007). Emotion recognition deficits arise early in the course of illness (Kucharska-Pietura et al., 2005) and predict worse social functioning (Brekke et al., 2007). Furthermore, abnormal visual scanning of emotional stimuli was found in siblings of patients with schizophrenia (Loughland et al., 2004). Moreover, healthy siblings performed better than patients but worse than controls on emotion identification and discrimination tests (Erol et al., 2010), which promotes the hypothesis of the trait-like nature of emotion recognition deficits.

1.2. Objectives

The primary objective of the present study was to compare ToM and emotion recognition performances in patients with schizophrenia between the acute and clinically stable phase. Our second objective was to compare social cognitive performance between patients in a clinically stable phase and healthy individuals. Associations between ToM, emotion recognition and psychotic symptom severity were also examined in both phases.

2. Materials and methods

2.1. Patient population

Patients with schizophrenia meeting the DSM-IV (American Psychiatric Association, 1994) criteria took part in our study. Patients were recruited from the inpatient units of the University of Debrecen Medical and Health Science Center, Department of Psychiatry, Debrecen, Hungary. Exclusion criteria were the following: any severe somatic illness, drug or alcohol addiction or abuse, major depressive disorder and schizoaffective disorder in the lifespan. Research diagnosis was based on diagnostic interviews guided by clinicians independent of this study. These interviews included the Structured Clinical Interview for DSM Disorders — Clinician Version (SCID-CV) and Research Version (SCID-RV). Age-matched control persons were healthy individuals who had no history of any psychiatric disorder or family history of psychosis. None of the control subjects had a history of substance abuse (alcohol, THC, hallucinogens, cocaine, opiates, inhalants, methamphetamines or other stimulants), which could potentially influence their performance. Furthermore, none of the control subjects took antipsychotics or other psychotropic medications like benzodiazepines (BZDs), antidepressants or mood stabilizers. All participants signed a written consent form. The study was performed in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans, and it was approved by the Regional and Institutional Ethics Committee. We examined 43 patients with schizophrenia and 41 healthy controls. Demographic and clinical characteristics of the participants are shown in Table 1.

2.2. Procedures

Patients and healthy subjects were tested with the RMET (Reading the Mind in the Eyes Test) assessing mentalization ability and the 'Ekman 60 Faces Test' measuring emotion recognition skill. The order of the two tasks was fixed during the study.

Previous studies on clinical (Randall et al., 2003) and on non-clinical samples (Kinderman et al., 1998) showed that ToM impairments predict biases in attributions, therefore, similar to the work of Hall et al. (2004) we decided to restrict social cognition assessments to ToM and emotion recognition in the present investigation.

2.2.1. ToM task

The revised short version of the RMET was used, which includes 36 photos (Richell et al., 2003) in contrast with the original revised version, which included 40 pictures (Baron-Cohen et al., 2001). Subjects were displayed 36 photos of the eye region of the face on the screen. Photos of actors and actresses were presented, the distribution of genders was equal. Four complex mental state descriptors (e.g. playful, comforting) were placed around the photo, one at each corner. One of these words identified the correct mental state of the person on the photo, the other words were foils. Target and foil words were collected by the authors of the test (Baron-Cohen et al., 2001), and the three foil words possibly have the same emotional valence as the target one has. The correct answers were based on the consensus of independent experts. Subjects are instructed to choose the word which best describes what the person in the picture is thinking or feeling. Results of Hungarian studies using this test confirmed that the eye region of the face plays an important role in emotional processing (Róza et al., 2012). Recent studies using the RMET verified the reliability of this tool measuring ToM abilities in schizophrenia (Bora and Pantelis, 2013). A Swedish study claimed that the test–retest reliability is fairly good for the child version of RMET and they found no indication of learning effects in case of repeating the test (Hallerback et al., 2009). A further study by Yildirim et al. (2011) found acceptable test–retest stability for the adult version, and also, a recent study proved a good test–retest stability for the RMET (Vellante et al., 2013).

2.2.2. Emotion recognition task

The Facial Expressions of Emotion: — Stimuli and Test (FEEST) computerized battery includes photographs from the Ekman and Friesen series of Pictures of Facial Affect (Ekman and F.W.V., 1976), and contains the Ekman 60 Faces Test that we used in the present study. In this test photos of 10 actors (6 females, 4 males) were chosen, each expressing one of the 6 basic emotions (anger, disgust, fear, happiness, sadness, surprise). Altogether sixty pictures depicting the six primary emotions were presented in random order. Subjects were asked to pair the emotion displayed in each photograph with one of the six emotion labels displayed on the screen. The software (FEEST) was available on a touch screen research computer in a laboratory room. The Hungarian version of Ekman 60 Faces Test has already been validated in the general Hungarian population and the results of the validation proved the validity and reliability of the test (Róza et al., 2012).

2.2.3. Psychotic symptom severity and medications

In order to assess symptom severity among patients the PANSS (Positive and Negative Syndrome Scale) was used (Kay et al., 1987) by a trained psychologist, who assessed all patients. The PANSS was rated on a 1 to 7 scale.