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Cognitive insight in psychosis: The relationship between self-certainty and self-reflection dimensions and neuropsychological measures

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ABSTRACT

Cognitive insight in schizophrenia encompasses the evaluation and reinterpretation of distorted beliefs and appraisals. We investigated the neuropsychological basis of cognitive insight in psychosis. It was predicted that, like clinical insight, cognitive insight would be associated with a wide range of neuropsychological functions, but would be most strongly associated with measures of executive function. Sixty-five outpatients with schizophrenia or schizoaffective disorder were assessed on tests of intelligence quotient (IQ), executive function, verbal fluency, attention and memory, and completed the Beck Cognitive Insight Scale, which includes two subscales, self-certainty and self-reflection. Higher self-certainty scores reflect greater certainty about being right and more resistant to correction (poor insight), while higher self-reflection scores indicate the expression of introspection and the willingness to acknowledge fallibility (good insight). The self-certainty dimension of poor cognitive insight was significantly associated with lower scores on the Behavioural Assessment of Dysexecutive Syndrome; this relationship was not mediated by IQ. There were no relationships between self-reflection and any neuropsychological measures. We conclude that greater self-certainty (poor cognitive insight) is modestly associated with poorer executive function in psychotic individuals; self-reflection has no association with executive function. The self-certainty and self-reflection dimensions of cognitive insight have differential correlates, and probably different mechanisms, in psychosis.

1. Introduction

Traditional 'insight' in psychiatry is most commonly viewed as a multi-dimensional construct incorporating awareness of illness, symptoms and the need for treatment (David, 1990; Amador et al., 1991). Individuals diagnosed with schizophrenia frequently disagree with mental health professionals about the nature of their experiences, and whether they are in need of psychiatric treatment such as medication. Such disagreements are generally viewed as reflecting poor insight on the part of the patient in one or more of these dimensions, which in turn has been linked to poor medication compliance and then to poor outcome (Morgan and David, 2004). There is a more recent suggestion that good insight can have maladaptive consequences for self-esteem and causes distress (Cooke et al., 2007a,b).

The neuropsychological correlates of traditional insight in schizophrenia have been investigated extensively. While there has been considerable heterogeneity in the results of these studies (Cooke et al., 2005), a recent meta-analysis (Aleman et al., 2006) has shown that poor insight is associated with poor functioning in a range of cognitive domains, including intelligence quotient (IQ), memory and executive function. There is also some evidence to suggest that the associations are particularly strong for the set-shifting and error monitoring aspects of executive function (Aleman et al., 2006).

Recently, Beck and colleagues (Beck and Warman, 2004; Beck et al., 2004) have distinguished between the traditional approach to insight, which they term 'clinical insight', and 'cognitive insight', which is a form of cognitive flexibility and encompasses the evaluation and correction of distorted beliefs and misinterpretations. They contend that a crucial cognitive problem in the psychoses (including schizophrenia) is that individuals are unable to distance themselves from their cognitive distortions (e.g., 'there is a conspiracy against me'), and are also impervious to corrective feedback (Moritz and Woodward, 2006). In contrast, individuals with panic disorder or obsessive–compulsive disorder are more likely to retain the ability to recognise that the conclusions they have made were incorrect, and therefore maintain good cognitive insight.

A lack of cognitive insight in individuals with schizophrenia contributes to both the impairment of clinical insight, and the development of delusions (Beck and Warman, 2004). An impairment

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in the capacity to evaluate misinterpretations and alter appraisals despite feedback from others, may lead an individual with schizophrenia to disagree with others who call their experiences symptoms of illness; this disagreement is then called an impairment of the 'awareness of symptoms' aspect of clinical insight. Poor cognitive insight, it is then argued, may also lead such individuals to conclude that their interpretations (appraisals) of their experiences (e.g., 'there is a conspiracy against me') are factually correct (Beck et al., 1994), contributing to the formation and maintenance of delusions. As in other cognitive models, cognitive models of psychosis emphasise the particular role of appraisals in delusional formation and maintenance (Garety et al., 2007). Recent findings have highlighted the potential importance of cognitive insight as a mediator of response to cognitive behavioural therapy for psychosis (Granholm et al., 2005), with increases in cognitive insight associated with reductions in positive, negative and general symptomatology (Granholm et al., 2006).

The Beck Cognitive Insight Scale (BCIS; Beck et al., 1994) has two distinct subscales, self-certainty and self-reflection. Poor insight is characterised by a high degree of certainty in one's (mis)interpretations, and a lack of self-reflectiveness. Beck and his colleagues (Beck and Warman, 2004; Beck et al., 2008) suggest that the BCIS is an indirect test of a putative impairment of the 'higher level' functions in schizophrenia, with the process of distancing oneself from highly salient (delusional) beliefs and having the capacity to view them in perspective requiring intact executive function.

The objective of this study was to examine the neuropsychological correlates of both dimensions of cognitive insight in schizophrenia. We hypothesised that, like clinical insight, cognitive insight will be associated with a wide range of neuropsychological functions, but will be most strongly associated with measures of executive function, particularly measures of set-shifting and error monitoring. These aspects of executive function, as stated earlier, have been found to show most strong associations with clinical insight (Aleman et al., 2006).

2. Method

2.1. Participants

Sixty-five outpatients (46 men, 19 women) who met the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DSM-IV) (American Psychiatric Association, 1994) criteria for the diagnosis of schizophrenia or schizoaffective disorder were recruited from the South London and Maudsley Foundation NHS Trust. The mean age of the participants was 38.9 years (range 19–65). All participants were on stable doses of antipsychotic medication (51 on atypical and 14 on typical antipsychotics) for at least 3 months prior to taking part in this study, were in a stable (chronic) phase of illness and were recruited from the community (all outpatients). The mean ratings of the participants on the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) were 16.8 (S.D. = 4.9) for the positive subscale, 18.3 (S.D. = 5.0) for the negative subscale and 32.5 (S.D. = 6.5) for the general psychopathology subscale. The study sample was the same as in Cooke et al. (2007a; this report did not examine neuropsychological data in relation to the BCIS or any other measure of insight).

After complete description of the study to the participants, written informed consent was obtained. The study procedures were approved by the Joint Research Ethics Committee of the South London and Maudsley NHS Foundation Trust and Institute of Psychiatry.

2.2. Clinical measures

Diagnoses were ascertained by a consultant level psychiatrist (DF) using the Structured Clinical Interview for DSM-IV Axis I disorders Research Version (SCID-P; Spitzer et al., 1994), who also administered the PANSS (Kay et al., 1987) and was blind to both the cognitive insight and neuropsychological test scores.

Cognitive insight was assessed using the BCIS (Beck et al., 1994), a 15-item self-report scale which measures the two dimensions of self-certainty and self-reflectiveness (but not insight into potential neuropsychological functioning deficits). Items are rated by the participant on a four-point scale from 'do not agree' to 'agree completely'. The self-certainty dimension is calculated as the sum of six items (possible range 0 – 18), and measures decision making regarding mental products: certainty about being right and resistance to correction (Beck et al., 1994), for example 'I know better than anyone else what my problems are'. Greater self-certainty indicates poorer cognitive insight (i.e., overconfidence in decision making). The self-reflectiveness dimension is calculated as the sum of the remaining nine items (possible range 0 – 27) and measures the expression of introspection and willingness to acknowledge fallibility (Beck et al., 1994), for example 'If someone points out that my beliefs are wrong I am willing to consider it', with a higher score indicating better cognitive insight.

The G12 item of the PANSS ('lack of judgement and insight') was collected as part of PANSS assessment and was subsequently used to assess the convergent validity of the cognitive insight measures. Clinical insight in this patient sample was also assessed using the Birchwood insight scale (BIS; Birchwood et al., 1994) and the expanded Schedule of Assessment of Insight (SAI-E, Kemp and David, 1997). Both of these measures assess David's (1990) three dimensions of clinical insight, namely (i) the presence of a mental illness, (ii) the need for treatment and (iii) the identification of symptoms as abnormal. The SAI-E also includes an additional item on awareness of the social consequences of illness. When administering the BIS, question 4 ("My stay in hospital is necessary") was excluded because all patients of this study were outpatients. The remaining three items from the 'awareness of the need for treatment' dimension were used to calculate a score for this subscale with equal weight to the other two subscales, allowing a total score to be calculated which has the same range (0–12) as the full BIS Scale. Questions 7 and 8 of the SAE-I (which assess the level of insight into the presence of symptoms) were excluded for eight patients, as they did not possess any symptoms for which insight could be rated. Higher scores indicate better insight on both the BIS and SAI-E.

2.3. Neuropsychological measures

General intellectual ability was assessed using the full-scale IQ estimate derived from the two-subtest version of the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), which consists of the Vocabulary and Matrix Reasoning subtests.

Executive function is a diverse construct, which encompasses a large number of processes (Godefroy, 2003). A broad battery of executive function tests was therefore employed to capture this diversity. The tests used (followed by the dependent variables) were the Wisconsin Card Sorting Test (WCST, computerised version; Heaton et al., 1993) – categories completed, % perseverative errors and % non-perseverative errors, the Trail Making Test (TMT; Reitan, 1955) – 'difference score' (part B time minus part A time, which controls for psychomotor speed), Brixton Spatial Anticipation test (Burgess and Shallice, 1997) – profile score, Hayling Sentence Completion test (Burgess and Shallice, 1997) – profile score, the Behavioural Assessment of Dysexecutive Syndrome (BADS; Wilson et al., 1996, 1998) – total score across the six subtests and the Stroop Colour-Word test (Golden, 1978) – interference score.

Explicit declarative memory (total recall) was assessed using the Hopkins Verbal Learning Test (HVLT; Shapiro et al., 1999).

Verbal fluency was assessed using the Controlled Oral Word Association Test (COWAT; Milner, 1975), which measures both phonological and semantic fluency using letter and category verbal fluency tests respectively. The total number of correct responses for the three letter fluency conditions was used as the measure of phonological fluency, while the total number of correct responses for the three category fluency conditions was used as the measure of semantic fluency.

The computerised Continuous Performance Test, Identical Pairs Version (CPT-IP; Cornblatt et al., 1988) was used to assess sustained attention. Performance on the CPT-IP task is indexed by 'hits' (responses to match trials) and false alarms (responses to catch trials). These two scores yield the signal detection index 'd'Prime', which represents the signal-to-noise ratio by measuring the sensitivity of the participant to the discrimination of targets from catch trials.

2.4. Statistical analyses

The distributions of all measures were inspected using histograms and *Q–Q* plots to determine whether they approximated normal distributions. Non-parametric statistics were applied to variables which did not approximate normal distributions. Two-tailed Pearson's correlations were used to examine relationships between variables which approximated normal distributions, while Spearman's rank correlations were used when one of the variables was not normally distributed. The Bonferroni method was used to control for multiple comparisons, with the standard alpha of $P<0.05$ divided by the number of tests undertaken for each insight variable, to yield a corrected alpha of $P<0.00357$.

Following a significant correlation between self-certainty subscale of the BCIS and the BADS total score at a level which survived correction for multiple comparisons, a forward Wald logistic regression with all cognitive measures entered as potential predictors and this subscale of the BCIS as the dependent variable was undertaken to examine the extent to which neuropsychological variables explained separate variance in self-certainty scores. A linear regression was used to determine whether the relationship between self-certainty and BADS total score was mediated entirely by general cognitive ability.

In secondary analyses, we also examined the correlations between insight as assessed by the PANSS G12 item, the BIS and the SAI-E, mainly with a view to replicate previous findings linking poor executive function to poor insight (Aleman et al., 2006).

3. Results

3.1. Data inspection

The three WCST variables, the Stroop interference score and the Trails B-A time were not normally distributed. The two BCIS scores, the