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The interaction of affective with psychotic processes: A test of the effects of worrying on working memory, jumping to conclusions, and anomalies of experience in patients with persecutory delusions

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ABSTRACT

Worry has traditionally been considered in the study of common emotional disorders such as anxiety and depression, but recent studies indicate that worry may be a causal factor in the occurrence and persistence of persecutory delusions. The effect of worry on processes traditionally associated with psychosis has not been tested. The aim of the study was to examine the short-term effects of a bout of worry on three cognitive processes typically considered markers of psychosis: working memory, jumping to conclusions, and anomalous internal experience. Sixty-seven patients with persecutory delusions in the context of a non-affective psychotic disorder were randomised to a worry induction, a worry reduction, or a neutral control condition. They completed tests of the cognitive processes before and after the randomisation condition. The worry induction procedure led to a significant increase in worry. The induction of worry did not affect working memory or jumping to conclusions, but it did increase a range of mild anomalous experiences including feelings of unreality, perceptual alterations, and temporal disintegration. Worry did not affect the occurrence of hallucinations. The study shows that a period of worry causes a range of subtle odd perceptual disturbances that are known to increase the likelihood of delusions. It demonstrates an interaction between affective and psychotic processes in patients with delusions.

1. Introduction

Worry is conventionally studied within the anxiety disorders, but it has recently been given prominence in a theoretical account of persecutory delusions (Freeman, 2007). Worry brings more implausible paranoid ideas to mind, keeps them there, and escalates the distress. There is increasing evidence to support this view. In a national epidemiological survey, individuals reporting concerns of plots to harm them had almost ten times higher odds of reporting worry than individuals without paranoid fears (Freeman et al., 2011). Cross-sectional studies with patients with persecutory delusions have shown that high levels of worry are common, comparable to those seen in generalised anxiety disorder, and that higher levels of worry are associated with more distressing paranoia (Freeman and Garety, 1999; Freeman et al., 2001; Startup et al., 2007; Morrison and Wells, 2007; Bassett et al., 2009; Freeman et al., 2010). Worry is not simply a consequence of paranoid thoughts however. Longitudinal studies have shown that worry predicts the later development and persistence of paranoid fears (Startup et al., 2007; Freeman et al., 2012b), and an experimental study has shown that higher levels of worry predict the occurrence of paranoid thoughts (Freeman et al., 2008). In the strongest tests of the causal role of worry in persecutory delusions, two clinical intervention studies have shown that directly targeting the cognitive style of worry significantly lessens paranoia (Foster et al., 2010; Hepworth et al., 2011). This series of studies indicates that worry in psychosis may well require the level of attention it receives in the anxiety disorders.

Theoretical accounts of psychosis increasingly highlight both affective and cognitive routes to delusions (e.g. Garety et al., 2001; Myin-Germeys et al., 2003; Bentall et al., 2009). This is not meant to

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imply that affect has no cognitive mechanisms but to make the distinction between what have traditionally been considered as emotional and psychotic processes. Non-affective cognitive disturbance in psychosis has had the greater focus (e.g. Hemsley, 1993; Frith, 1992; Kapur, 2003; Green et al., 2004), but the emotional route to delusions is gaining evidential support (e.g. Lincoln et al., 2010b; Ben-Zeev et al., 2011; Thewissen et al., 2011). The study of worry in psychosis is an example of the latter affective route, since worry is traditionally considered central to the experience of anxiety problems and it is not listed in descriptions of psychosis, but is there an impact of worry on cognitive processes traditionally associated with psychosis? Is there an interaction between emotional and psychotic processes? To answer this question we examined the immediate effects of a bout of worrying on three processes studied in psychosis: working memory, jumping to conclusions, and perceptual anomalies. Meta-analyses have consistently shown that working memory performance is impaired in individuals with a diagnosis of schizophrenia (e.g. Lee and Park, 2005; Forbes et al., 2009), leading to the view that it may be an endophenotype for the diagnosis (e.g. Horan et al., 2008). Jumping to conclusions, a tendency to seek less data before reaching a decision, has been specifically linked with delusional beliefs, and it has been reliably found in patients with psychosis (see Garety et al., 2007; Freeman, 2007; Fine et al., 2007). Particular cognitive dysfunctions in psychosis are considered to produce anomalies of experience (such as perceptual and attentional disturbances, altered experience of self, aberrant salience) that lead to delusional misinterpretations (e.g. Maher, 1988; Kapur, 2003; Uhlhaas and Mishara, 2007); the presence of such anomalies have been repeatedly found in patients with psychosis (e.g. Chapman, 1966; Phillipson and Harris, 1985; Bunney et al., 1999; Parnas et al., 2003) and to be associated with delusional ideation (e.g. Bell et al., 2006; Freeman et al., 2008, 2010). We therefore studied worry in relation to three processes commonly considered important cognitive markers of psychosis.

Study of a bout of worry in patients with psychosis has not been reported before. However, a bout of worry in non-clinical worriers has been found to be associated with a reduction in working memory capacity (Hayes et al., 2008; Leigh and Hirsch, 2011), and an anxious mood induction has been found to increase the jumping to conclusions bias in a non-clinical sample (Lincoln et al., 2010a), although not in a delusions group (So et al., 2008). Whether a mood induction increases perceptual anomalies is unknown, but levels of anxiety positively correlate with the presence of perceptual distortions (e.g. Bell et al., 2011; Tone et al., 2011). In the current study it was hypothesized that psychotic processes would be exacerbated when patients engage in a period of worry: that worry makes it harder to process information and reason and that it creates a more subjectively odd state. It was predicted that a decrease in working memory, an exacerbation of the jumping to conclusions reasoning style, and the occurrence of anomalous experiences would be greatest in a worry induction group and least in a worry reduction condition. In order to enhance the clinical relevance of the study, we chose to study a bout of worry in patients with persecutory delusions in which worry was identified as at a high level; the effects of worry were studied in those who were prone to adopt this cognitive style.

2. Method

2.1. Participants

67 patients with persecutory delusions completed the study during the baseline assessment, prior to randomisation, of a clinical trial (ISRCTN23197625) (Freeman et al., 2012a). The participants were recruited from two mental health NHS Trusts: Oxford Health NHS Foundation Trust, Southern Health NHS Foundation Trust. The inclusion criteria were: a current persecutory delusion as defined by Freeman and Garety (2000); scoring at least 3 on the conviction scale of the PSYRATS delusions scale (i.e. at least 50% conviction in the delusion) (Haddock et al., 1999); that the delusion had persisted for at least three months; a clinical diagnosis of schizophrenia, schizoaffective disorder or delusional disorder; a clinically significant level of worry, as indicated by scores above 44 on the Penn State Worry Questionnaire (see Startup and Erickson, 2006); aged between 18 and 65; and no changes to medication in the past month. Criteria for exclusion were: a primary diagnosis of alcohol or substance dependency or personality disorder; organic syndrome or learning disability; a command of spoken English inadequate for engaging in therapy; and currently having individual CBT.

2.2. Baseline assessments

2.2.1. Psychotic Symptom Rating Scales – delusions (PSYRATS; Haddock et al., 1999)

The PSYRATS – delusions is a six item multidimensional measure. It assesses the conviction, preoccupation, distress and disruption associated with delusions. Symptoms over the last week are rated. Higher scores indicate greater severity.

2.2.2. Positive and Negative Syndrome Scale (PANSS; Kay, 1991)

The PANSS is a 30-item rating instrument developed for the assessment of patients with schizophrenia. Symptoms over the last week were rated (i.e. currently present). Higher scores indicate the greater presence of psychiatric symptoms.

2.2.3. Green et al. Paranoid Thoughts Scale (GPTS; Green et al., 2008)

The GPTS is a thirty-two item measure of paranoid thinking. Part A assesses ideas of reference (e.g. 'It was hard to stop thinking about people talking about me behind my back') and Part B assesses ideas of persecution (e.g. 'I was convinced there was a conspiracy against me'). Each item is rated on a 5-point scale. Higher scores indicate greater levels of paranoid thinking. The scale was completed for the period of the previous fortnight.

2.2.4. Penn State Worry Questionnaire (Meyer et al., 1990)

The PSWQ is the most established measure of trait worry style and has been used in non-clinical and clinical populations (see review by Startup and Erickson, 2006). Each of the sixteen items is rated on a 5-point scale. Higher scores indicate a greater tendency to worry.

2.2.5. Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999)

The WASI is a standardised short and reliable measure of intelligence. The Vocabulary and Matrix Reasoning subtests were used to obtain an estimate of IQ.

2.3. Tasks completed before and after the randomisation condition

2.3.1. Visual analogue rating scales (VAS)

In order to test the effects of the three conditions on worry and mood state, the participants marked on three 0 ('Not at all') to 100 ('totally') visual analogue scales the degree to which 'right now' they felt worried, anxious, or happy.

2.3.2. Working memory: tasks from the Wechsler Adult Intelligence Scale III (WAIS-III) (Wechsler, 1997)

Three working memory tasks were used: digit span forwards, digit span backwards, and letter–number sequencing. These are

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