Can cognitive deficits explain differential sensitivity to life events in psychosis?

Abstract Background Life events (LE) have been found to influence the onset and course of psychotic disorders. It has been suggested that LE have their effect by increasing underlying sensitivity to daily life stress, a reported vulnerability marker for psychosis. As increased stress-sensitivity and cognitive impairments have been shown to be negatively associated with each other in patient populations, it is attractive to hypothesise that the impact of LE on sensitivity to daily stress is modified by the degree of cognitive impairment, higher levels of cognitive impairment giving rise to reduced impact of LE on daily life stress-sensitivity.

Methods Patients with psychotic illness (n = 42) were studied with a) a standard battery of neuropsychological tests to assess cognitive functioning, b) the Experience Sampling Method (a structured diary technique assessing current context and mood in daily life) to assess (i) appraised subjective stress related to daily events and activities, and (ii) emotional reactivity conceptualised as changes in both negative affect (NA) and positive affect (PA), and c) the Brown and Harris Life Event and Difficulties Schedule to assess LE over the last year. Results Multilevel regression analyses showed that a prior history of LE increased the sensitivity for daily life stress in subjects with the best performance on the cognitive tests. Conclusions Subjects with cognitive impairments, who already were shown to have lower levels of sensitivity to daily life stress (Myin Germeys et al. 2002), may additionally be less reactive to prior exposure to LE. This result fits with the notion of separate affective and cognitive pathways of symptom formation in psychosis, the cognitive pathway being characterised by severe cognitive deficits and the affective pathway by increased levels of stress-sensitivity associated with prior exposure to LE.

Key words psychosis – cognition – stress – life events

Introduction

Life events (LE) have been found to influence the onset and course of psychotic disorders. Increased numbers of LE have been associated with higher levels of symptomatology and increased relapse rates (Bebbington et al. 1993; Bebbington et al. 1996; Lukoff et al. 1984; Miklowitz 1994; Norman and Malla 1993). However, the mechanism by which LE influence the occurrence and course of psychotic disorders is not known. Some authors have suggested that LE do not trigger relapses directly, but rather act by increasing vulnerability cumulatively with successive exposures (Bebbington et al. 1996; Hirsch et al. 1996).

The underlying mechanism by which LE act cumulatively to the risk function may reside in their impact on sensitivity for daily life stress. It has been shown in the general population that life events affect emotional reactivity to smaller daily events (Kanner et al. 1981; Eckrenode 1984). Furthermore, these smaller daily events have been reported to be important predictors of psychological symptoms in general (Kanner et al. 1981;
Monroe 1983), of subjective distress (Norman and Malla 1991), and of relapse rates in schizophrenia (Malla et al. 1990). Recent work reported that prior exposure to LE in patients with schizophrenia did not affect the appraised stressfulness of daily events. However, prior exposure to LE did modify the emotional reaction to daily life stress, both in terms of increases in negative affect and decreases in positive affect (Myin-Germeys et al. in press). The apparent discordance between effects of LE on subjective appraisal of stress and emotional reactivity can be understood in terms of underlying vulnerability. It has been reported that relatives of patients with psychosis are not different from controls in the average level of appraised stress, nor in average mood level (Myin-Germeys et al. 2001b). However, they did report a significantly larger emotional reactivity compared to controls. Therefore, it was argued that emotional reactivity constitutes an underlying vulnerability marker for psychosis. It appears that LE may impact specifically on this underlying vulnerability.

Previous work has shown that the two domains of vulnerability of cognitive impairment and sensitivity to daily life stress have non-overlapping distributions in patient populations: individuals with greater levels of cognitive impairment have lower levels of sensitivity to daily life stress (Myin-Germeys et al. 2002). Therefore, if LE impact on sensitivity to daily life stress, it is attractive to hypothesise that this effect of LE is modified by the degree of cognitive impairment, higher levels of cognitive impairment giving rise to a reduced impact of LE on daily life stress-sensitivity. The present study will investigate the effect of LE on emotional reactivity to daily life stress in relation to cognitive performance in 42 patients diagnosed with psychotic disorder.

Subjects and methods

Subjects

The sample consisted of 50 psychotic subjects. All patients were under current treatment. Selection criteria, assessed by a research physician or research psychologist, were a lifetime occurrence of psychotic symptoms according to the RDC (Research Diagnostic Criteria) for at least 2 weeks in clear consciousness. Inclusion criteria were: 1) age 18–55 years, 2) sufficient command of the Dutch language, and 3) normal physical examination. Exclusion criteria were: 1) endocrine, cardiovascular, or brain disease, 2) use of alcohol in excess of five standard units per day, 3) weekly use of illicit drugs, 4) history of head-injury with loss of consciousness, and 5) being in need of in-patient care, intensive case management home care or crisis intervention. Written informed consent, conforming to the local ethics committee guidelines, was obtained from all subjects. Patients were recruited through the ambulatory mental health facilities in Maastricht, The Netherlands, and through patient associations in the southern part of the Netherlands.

The diagnostic procedure included extensive screening with diagnostic interviews that included the Life Chart (Susser et al. 2000), the Brief Psychiatric Rating Scale (Ventura et al. 1993), and the Positive and Negative Syndrome Scale (Kay et al. 1987) to map psychiatric symptomatology. Interview data and clinical record data were used to complete the Operational Criteria Checklist for Psychotic Illness (OCUPI) yielding DSM-III-R diagnoses through the OPCRIT computer program (McGuffin et al. 1991).

Experience Sampling Method (ESM)

The Experience Sampling Method is a within-day self-assessment technique. Previous applications of ESM in schizophrenia (Delespaul et al. 2002; Myin-Germeys et al. 2000; Myin-Germeys et al. 2001a; Myin-Germeys et al. 2001b) have demonstrated the feasibility, validity, and reliability of the method in this population. Subjects were studied in their normal daily living environment. They received a digital wristwatch and a set of ESM self-assessment forms collated in a booklet for each day. Ten times a day on six consecutive days, the watch emitted a signal (beep) at unpredictable moments between 7.30 a.m. and 10.30 p.m. After every “beep”, subjects were asked to stop their activity and fill out the ESM self-assessment forms previously handed to them, collecting reports of thoughts, current context (activity, persons present, location), appraisals of the current situation, and mood. All self-assessments were rated on 7-point Likert scales. The ESM procedure was explained to the subjects during an initial briefing session and a practice form was completed to confirm that subjects were able to understand the 7-point Likert scale format. Subjects were instructed to complete their reports immediately after the beep, thus minimising memory distortions, and to record the time at which they completed the form. During the actual sampling period, research staff repeatedly called the subjects to assess whether they were complying with the instructions. In order to know whether the subjects had completed the form within 15 minutes of the beep, the time at which subjects indicated they completed the report was compared to the actual time of the beep. All reports completed more than 15 minutes after the signal were excluded from the analysis. Previous work has shown that reports completed after this interval are less reliable and consequently less valid (Delespaul 1995). Subjects with less than 20 valid reports were excluded from the analysis.

Emotional stress reactivity assessment

Previously, emotional stress reactivity was conceptualised as mood in reaction to daily events and minor disturbances in daily life (Myin-Germeys et al. 2001b). Both the mood measures and the stress measures were derived from the experience sampling reports as described below.

Assessment of mood

Mood states reported after each beep were assessed with ten mood adjectives rated on 7-point Likert scales (1 not at all to 7 very). Factor analyses (principal component analysis with Harris-Kaiser rotation) on the raw within-subject scores identified two factors with eigenvalues greater than 1 explaining 41 % of the total variance. Two factor-based scales with equal weights for each item were created. The items down, guilty, insecure, lonely, and anxious formed the NA scale (Negative Affect), (Cronbach’s α = 0.79). The items happy, cheerful, relaxed, and satisfied formed the PA scale (Positive Affect) (Cronbach’s α = 0.89). The item angry had low loadings on both factors and was excluded to enhance differentiation between the two factors.

Assessment of stress

Stress was conceptualised as subjective appraised stressfulness of distinct events as well as of minor disturbances that continually happen in the natural flow of daily life. These were:

1. Event-related stress:
   - after each beep, subjects were asked to report the most important event that happened between the current and the previous report. This event was subsequently rated on a 7-point bipolar scale (–3 = very unpleasant, 0 = neutral, 3 = very pleasant). Responses were recoded to allow high scores to reflect stress (–3 = very pleasant, 0 = neutral, 3 = very unpleasant). Response on this item is called event-related stress.

2. Activity-related stress:
   - after each beep, subjects judged their current activity on three self-report items (scored on 7-point Likert scales, 1 = not at all and 7 = very). The mean of the scales ‘I am not skilled to do this activ-