Expressed emotion as a predictor of the first psychotic episode — Results of the European prediction of psychosis study

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ABSTRACT

Objective: To investigate the impact of expressed emotion (EE) on the risk of developing the first psychotic episode (FEP).

Method: The European Prediction of Psychosis Study (EPOS) investigated 245 patients who were at clinical high risk (CHR) of psychosis. The predictive value of EE alone and as a part of the multivariate EPOS model was evaluated.

Results: "Perceived irritability", a domain of the Level of Expressed Emotion Scale (LEE), was found to be predictive for the First Psychotic Episode (FEP), even as an individual variable. Furthermore, it was selected in the multivariate EPOS prediction model, thereby replacing two of the original predictor variables. This led to an improved revised version that enabled the identification of three significantly different risk classes with a hazard rate of up to 0.911.

Conclusions: CHR subjects who perceive the most important person in their individual social environment to be limited in their stress coping skills had a higher risk of conversion to the first psychotic episode. The importance of this risk factor was further demonstrated by an improvement of risk estimation in the original EPOS predictor model.

Perceiving a reference person as stress-prone and thus potentially unreliable might amplify self-experienced uncertainty and anxiety, which are often associated with the prodromal phase. Such an enforcement of stress-related processes could promote a conversion to psychosis.

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1. Introduction

The psychological construct of expressed emotion (EE) was originally developed as a measure of the emotional attitude and the communication style of caregivers towards mentally ill people (Brown, 1966; Brown et al., 1972).

EE has been shown to be a reliable and valid predictor of adverse clinical outcomes for a range of different mental disorders (Butzlaff and Hooley, 1998; Leff et al., 1985; Miklowitz et al., 1987; Priebe et al., 1989), including the relapse of psychosis (Bebbington and Kuipers, 1994; Brown et al., 1972; Butzlaff and Hooley, 1998; Hooley, 2007; Onwumere et al., 2009; Phillips et al., 2007; Vaughn and Leff, 1976). In the families of First Episode Psychosis (FEP) patients, the prevalence rates of high EE ranged from 32 to 73.5% (Heikkila et al., 2002; McNab

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et al., 2007; Meneghelli et al., 2011; Onwumere et al., 2009; Raune et al., 2004). Increased levels of EE were even recorded in subjects who experienced symptoms that are associated with a clinical high risk state (CHR) of developing a psychotic disorder (Meneghelli et al., 2011; Schlosser et al., 2010; Tsai et al., 2015). CHR is defined by either basic symptom (BS) criteria (Schultze-Lutter, 2009) and/or ultra-high risk (UHR) criteria (Schultze-Lutter et al., 2013). Two UHR studies, using the Structured Interview for Psychosis-Risk Syndromes (SIPS), reported a positive correlation of criticism levels with positive symptom severity during the 6-month follow-up (Schlosser et al., 2010) or a negative correlation with the severity of negative symptoms at the baseline, respectively (Tsai et al., 2015). However, one study, using the Brief Psychiatric Rating Scale, found no correlation of increased EE levels with symptom severity in a UHR sample (Meneghelli et al., 2011). A 15-year family study following non-psychotic adolescents with behavioural difficulties suggested that EE increased the risk for FEP (Goldstein, 1987). Furthermore, a risk increasing gene × EE interaction was observed in the offspring of mothers with schizophrenia (Tienari et al., 2004).

In contrast to the relationship between EE and relapse in already clinically manifest psychotic disorders, the impact of EE on conversion into the first psychotic episode in subjects clinically at a high risk still has to be explored.

EE has been assessed in various ways. The semi-structured Camberwell Family Interview (CFI) (Vaughn and Leff, 1976) has been conducted with key relatives to analyse the quality of communication between index patients and their significant others. As the CFI is rather time-consuming, alternatives have been developed for use in larger samples (Hooley and Parker, 2006). The Five Minute Speech Sample (FMSS) (Magana et al., 1986), for instance, allows family members to voice their thoughts and feelings for 5 min; the recording is later coded for the overall level of EE and criticism. While these instruments focus on the perspectives of the relatives, the Level of Expressed Emotion Scale (LEE) (Cole and Kazarian, 1988) is a valid, feasible, and economic measure of EE with good psychometric properties (Gerlsma and Hale 3rd, 1997), which provides the opportunity to assess the experiences of patients in their social environments.

1.1. Aims of the study

As part of the European Prediction of Psychosis Study (EPOS), a prospective, naturalistic field study, we aimed to investigate the relationship between the EE perceived by the CHR patients and the risk of conversion to psychosis. EPOS developed a six-factor prediction model and introduced risk stratification by a prognostic index in the CHR research (Ruhrmann et al., 2010). We examined the following hypotheses: (1) the perception of EE is predictive for conversion to psychosis and (2) introducing the EE variables will improve the EPOS prediction model.

2. Method

2.1. Participants

After approval by the respective local ethic committees, 245 CHR participants were recruited from early-detection services at six European University centres (consort chart Fig. S1). Written informed consent was obtained from all the participants (or their parents if they were minors). Aside from an age range of 16–35 years, the inclusion criteria comprised a CHR syndrome defined by the BS criterion "cognitive disturbances" (COGDIS) as well as by a modified version of the UHR criteria (Table S1). Exclusion criteria included having experienced a prior psychotic episode for more than seven days according to DSM-IV, having symptoms relevant for inclusion arising from a known general medical disorder, drugs, or alcohol dependency, and a verbal IQ < 85.

Conversion was operationalized by the presence of a SIPS positive item with a severity score of six (=psychotic) for more than seven days.

EE was assessed in 235 patients (characterized in Table 1). The follow-up period was 18 months. During this period, antipsychotic (AP) drugs were prescribed to 31 (13.2%) patients, antidepressants (AD) to 45 (19.1%) patients, and a combination of both to another 21 (8.9%) patients; no valid information was available for 30 (12.8%) subjects.

2.2. Assessments

Since not only observer assessments (Hooley and Parker, 2006; Magana et al., 1986; Vaughn and Leff, 1976) but also the subjective perception of patients' EE has been considered an important predictor of relapse (Cole and Kazarian, 1993; Hooley, 2007), the 38-item version of the LEE (Cole and Kazarian, 1988, 1993; Gerlsma and Hale 3rd, 1997; Gerlsma et al., 1992) was included in the broad EPOS battery. The four subscales are as follows: perceived lack of emotional support (19 items), perceived intrusiveness (8), perceived irritability (6), and perceived criticism (5). Items are assessed on a four-point Likert scale from 1 = "untrue" to 4 = "true" (higher scores imply worse conditions) with regard to the most influential person in the respondents' lives during the preceding three months.

To the best of our knowledge, this is the first time the LEE was used in a CHR sample. In addition to the already available English and Dutch versions the scale was also translated into German and Finish; further statistical and psychometric details have been reported in Table S2. Cox regressions were controlled for any language effects by considering the "centre" as a potentially confounding variable (Twisk, 2006).

At-risk psychopathology was assessed by the SIPS, version 3.0 (McGlashan et al., 2001) and by the Bonn Scale for the Assessment of Basis Symptoms (BPAPS-P) (Schultze-Lutter, 2002). The 4 SIPS subscales (positive, negative, disorganization, and general symptoms) include 4–6 items (19 in total) rated on a seven-point severity scale (scores = 0–6). The EPOS investigators, experienced clinical psychologists, and psychiatrists received extensive training by one of the scale's authors, Tandy J. Miller, PhD. Pairwise inter-rater concordance for the SIPS was 77%, which was determined acceptable by the training team (Ruhrmann et al., 2010). BSABS-P, an abbreviated item list of the Schizophrenia Proneness Instrument (SPI-A) (Schultze-Luttter et al., 2007), includes three subscales, providing a total of 33 cognitive, perceptual, and motor disturbances assessed on a seven-point severity scale (scores = 0–6), with the maximum frequency of occurrence during the preceding three months as the guiding criterion. Every item corresponds to a single symptom. The BSABS-P differs in structure from the SIPS; in SIPS, items are mostly defined by multiple symptoms. The EPOS investigators received repeated training by one of the scale's authors, Frauke Schultze-Lutter, PhD. The concordance rate, with expert rating (Frauke Schultze-Lutter), was 87.9% (Ruhrmann et al., 2010).

2.3. Statistical analysis

The predictive value of each individual LEE subscore was calculated separately by univariate Cox regression analyses (CRAs). To identify the most predictive combination, all the LEE scores were then entered into a stepwise CRA.

After testing the stability of the original six-factor EPOS model in a sample with complete LEE and EPOS prognostic score (PS) variables ($n = 230$, 35 converters), including a bootstrapping procedure (5000 samples) (Loughin, 1998; Tropsha et al., 2003), we explored the impact of the remaining LEE variables on the EPOS PS. Variables with a bootstrapping 95% confidence interval, including zero between the lower and the upper bounds were omitted (Loughin, 1998). All the original variables were entered in blockwise CRA; the LEE variables were added stepwise in the second block. The robustness of the resulting model was assessed by a further bootstrapping procedure; after