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Environmental factors and social adjustment as predictors of a first psychosis in subjects at ultra high risk

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ABSTRACT

Background: The onset of schizophrenia is associated with genetic, symptomatic, social and environmental risk factors. The aim of the present study was to determine which environmental factors may contribute to a prediction of a first psychotic episode in subjects at Ultra High Risk (UHR) for developing psychosis.
Method: We included 72 UHR subjects and followed them over a period of 36 months, of whom nineteen (26.4%) made a transition to psychosis. We applied survival analyses to determine associations between a transition to psychosis and environmental factors and social adjustment. To determine which items are the best predictors of transition to a first psychotic episode, Cox Regression analyses were applied.
Results: Urbanicity, receiving state benefits and poor premorbid adjustment (PMA) significantly influenced the transition to psychosis. Urbanicity (Wald = 10.096, p = .001, HR = 30.97), social–sexual aspects (Wald = 8.795, p = .003, HR = 1.91) and social–personal adjustment (Wald = 10.794, p = .001, HR = 4.26) appeared to be predictors for developing psychosis in our UHR group.
Conclusions: Environmental characteristics and social adjustment are predictive of transition to a psychosis in subjects at UHR. These characteristics should be implemented in a model for prediction of psychosis. Such a model would be more specific than current models and may lead to patient-specific preventive interventions.

1. Introduction

Schizophrenia and related psychoses are severe, mostly lifelong disorders with an onset in adolescence and young adulthood and with high morbidity and mortality (McGrath et al., 2008). The symptoms and signs before the first psychotic episode—during the so-called prodromal phase—are not well defined, precluding the possibility of predicting the onset of a first psychotic episode. If we can identify risk factors for developing psychosis better, we may be able to shorten, delay or even to prevent a first psychotic episode.

The prodroma\l phase is characterized by various mental state features, including nonspecific symptoms such as depressed mood and anxiety as well as sub threshold or attenuated psychotic symptoms. The prodromal period is found to be highly variable in length: it ranges from a few days to a period with a duration of many years (McGorry et al., 1995; Yung and McGorry, 1996). A mean duration of 4.8 years has been reported (Häfner and Maurer, 2006). Since the prodromal stage can only be determined retrospectively, putatively prodromal subjects are referred to as ultra high risk (UHR).

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The distinction of an UHR group turned out to be a partially successful for psychosis prediction. Belonging to one of these groups predicts psychosis after one year in 12–50% of the people with an UHR state (Yung et al., 2007). Limitations of these initial studies were the small numbers of included individuals at risk, the large number of false positive inclusions in these studies and the short duration of the follow-up period. Therefore it can be useful to look at additional factors that help predict onset of psychoses in vulnerable individuals.

Increasing knowledge on risk factors for schizophrenia recognized gene–environment interactions as important ingredients. A meta-analysis of ten studies shows that approximately 30% of all schizophrenia incidences may be related to growing up and living in an urban environment (Krabbendam and van Os, 2005). This implies that urbanicity may be the strongest risk factor of all environmental factors for schizophrenia and related psychotic disorders. In addition to urbanicity, four other environmental risk factors have been described in a review by Os van et al. (2005). These include: cannabis, minority status, early trauma and prenatal and early childhood exposures. Prenatal and early childhood environmental effects could be folate or vitamin D deficiency, viral infections or adverse effects associated with high or low birth weight. A recent study suggests that unemployment, social isolation, reduced employment achievement and expectations are also associated with the risk of psychosis (Reininghaus et al., 2008). Poor premorbid adjustment in schizophrenia is associated with worse prognosis of the disease (Rabinowitz et al., 2005, 2006; Haim et al., 2006). Also premorbid adjustment, as assessed with the Premorbid Adjustment Scale-PAS (Cannon-Spoor et al., 1982) is suggested to be a valuable phenotype characteristic in schizophrenia development (Schmael et al., 2007). Shapiro et al. (2009) found that both patients and their siblings shared poor adjustment in childhood and adolescence. Possibly this could be due to shared genetic or environmental risk factors.

Based on environmental factors and premorbid social adjustment characteristics found or suggested to be risk factors by previous researchers, we investigated their associations with transition to psychosis in subjects already at UHR for developing psychosis. We wanted to investigate if these environmental factors and premorbid social adjustment characteristics were associated with transition to psychosis independently of baseline clinical symptomatology as described by Velthorst et al. (2009). Specifically, we hypothesized that UHR subjects with the following characteristics; urbanicity, unemployment, receiving state benefits, ethnicity, head trauma, complications during intrauterine development or birth complications and with poorer premorbid social adjustment were more likely to make a transition to psychosis than those without.

2. Methods

The present study, a naturalistic study with its major focus on the course of UHR symptomatology, took place at the Amsterdam site of the "Dutch Prediction of Psychosis Study (DUPS)". Between August 2001 and July 2009 data were collected. Our sample is similar to the sample used by Velthorst et al. (2009).

2.1. Subjects

Inclusion criteria: subjects had to be between 12 and 35 years old and had no previous psychotic episode for more than one week, as assessed with the Structured Clinical Interview for DSM-IV (SCID), section B and C (Spitzer et al., 1992). During the interview, a family psychiatric history, a rating of schizotypal personality disorders, and the Global Assessment of Functioning (GAF) Score (American Psychiatric Association, 1994) was also obtained. In addition, each subject had to fall into one or more of the following groups:

1. Familial risk or schizotypal personality disorder in the identified patient plus reduced functioning: Individuals with a DSM-IV schizotypal personality disorder or a first-degree relative with a history of any DSM-IV psychotic disorder and a change in mental state or functioning in the individual leading to a reduction of 30% or more on the GAF Scale. A "best estimate" derived from an independent interview with the subject and a close relative, mostly one of the parents, defined the initial baseline of functioning.
2. Attenuated psychotic symptoms: Presence of at least one of the UHR symptoms as assessed with the Structured Interview for Prodromal Symptoms (SIPS) (Miller et al., 2002). The SIPS is a comprehensive diagnostic tool designed specifically for the assessment of the whole spectrum of prodromal signs and symptoms. The scale is composed of 19 items (5 positive, 6 negative, 4 disorganization, 4 general symptoms) each of which is given a score of 0 to 6 according to defined criteria. A score between 3 and 5 on the positive symptoms indicates attenuated psychotic symptoms and a score of 6 indicates a psychotic state. These symptoms should occur at least several times a week and should have been present for at least one week.
3. Brief, limited or intermittent psychotic symptoms (BLIPS): a score of 6 on one of the positive items of the SIPS, with a duration of less than one week and spontaneous remission.
4. Basic symptoms: At least two self-perceived deficiencies of cognition or perception: basic symptoms assessed with the Bonn Scale for the Assessment of Basic Symptoms — Prediction List (BSABS-P) (Klosterkötter et al., 2001). The BSABS-P contains 17 selected self-perceived disturbances in cognition and perception that were found to be predictive for a transition to psychosis over a 10 year period. Each basic symptom is given a score of 0 to 6 according to frequency of occurrence. A score of 3 or more on at least 2 of the first 9 items also indicates an UHR state and makes the subject eligible for the study.

Exclusion criteria were: IQ below 85, symptoms due to an organic etiological factor or solely related to drug use. Subjects who used cannabis were asked if they had a period of symptoms in which they did not use cannabis and if not they were asked to stop using for two weeks to see if symptoms continued. Subjects who used hard drugs (e.g. cocaine, heroin, amphetamines and magic mushrooms) were excluded.

The investigation was carried out in accordance with the latest version of the Declaration of Helsinki. The study design was approved by the Medical Ethical Committee of the Academic Medical Centre. Informed consent of all participants