



Demographic correlates of attenuated positive psychotic symptoms



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ABSTRACT

It is now well established that the utilization of standardized clinical criteria can enhance prediction of psychosis. These criteria are primarily concerned with the presence and severity of attenuated positive symptoms. Because these symptom criteria are used to derive algorithms for designating clinical high risk (CHR) status and for maximizing prediction of psychosis risk, it is important to know whether the symptom ratings vary as a function of demographic factors that have previously been linked with symptoms in diagnosed psychotic patients. Using a sample of 356 CHR individuals from the NAPLS-II multi-site study, we examined the relation of three sex, age, and educational level, with the severity of attenuated positive symptom scores from the Scale of Prodromal Symptoms (SOPS). Demographic factors accounted for little of the variance in symptom ratings (5–6%). Older CHR individuals manifested more severe suspiciousness, and female CHR participants reported more unusual perceptual experiences than male participants. Contrary to prediction, higher educational level was associated with more severe ratings of unusual thought content, but less severe perceptual abnormalities. Overall, sex, age and education were modestly related to unusual thought content and perceptual abnormalities, only, suggesting minimal implication for designating CHR status and predicting psychosis-risk.

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1. Introduction

Extensive research efforts have aimed to understand the causes of schizophrenia and other psychotic disorders, yet the etiological determinants remain largely unknown (Jablensky, 1997). The past decade has been marked by an increased interest in the period of functional decline preceding the clinical onset of psychosis, and this shift in focus has been accompanied by efforts to enhance prospective risk prediction. This period is referred to as the prodrome, and it can last from months to several years (Addington and Heinssen, 2012). Individuals with symptoms characteristic of a prodromal state are often designated as “clinical

high risk” (CHR). Characterizing the phenomenology in this period and optimizing clinical prediction of risk for conversion to psychosis are top priorities.

It has been demonstrated that individuals who meet standardized criteria for measuring prodromal signs are at a significantly elevated risk for developing a psychotic disorder within a few years following baseline assessment (Cannon et al., 2008; Nelson et al., 2013; Ruhrmann et al., 2010). In particular, ratings of the severity of attenuated positive psychotic symptoms enhance prediction of subsequent psychosis with noteworthy sensitivity and specificity (Cannon et al., 2008). It is assumed that future refinements of clinical algorithms, as well as the addition of biomarkers, will further enhance prediction and targeted preventive interventions.

It is well-established that demographic factors are associated with both the clinical presentation and progression of psychosis; sex, age, and education level have well-replicated relationships with schizophrenia-spectrum risk rates and symptoms (Choi et al.,

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2009; Moukas et al., 2010; Willhite et al., 2008). The aim of the current study is to characterize the nature of the relationship between these demographic factors and positive symptoms in CHR individuals to improve prediction of subsequent psychosis, as optimal prediction algorithms may vary as a function of demographic factors. Previous studies of high-risk individuals suggest that age and sex are not associated with conversion to psychosis (Cannon et al., 2008; Nelson et al., 2013; Schultze-Lutter et al., 2007; Velthorst et al., 2009; Ziermans et al., 2011). Outcomes regarding education, however, are mixed with some finding associations with conversion (Ruhrmann et al., 2010; Schultze-Lutter et al., 2007) and others not (Mason et al., 2004). The current paper aims to explore demographic predictors with specific positive symptoms, the primary determinants of conversion status. If a pattern of symptom presentation can be gleaned, including demographically-related protective factors, there will be significant implications for targeted intervention.

1.1. Sex differences

Research on sex differences across the schizophrenia-spectrum has examined the development, functional impairments, and course of these illnesses. The most well-replicated symptom trends are sex differences in symptom severity; males tend to exhibit greater thought disorder than females (Gur et al., 1996; Thorup et al., 2007a,b), whereas females tend to endorse more auditory hallucinations (Marneros, 1984; Rector and Seeman, 1992; Sharma et al., 1999; Tang et al., 2007; Thorup et al., 2007a,b), paranoia, and persecutory delusions (Andia et al., 1995; Goldstein and Link, 1988; Räsänen et al., 2000; Tang et al., 2007). Although research examining sex differences in CHR samples is limited, the findings to date are consistent with those on schizophrenia; CHR females exhibit greater magical thinking and auditory hypersensitivity (Moukas et al., 2010).

1.2. Age

The modal age range for psychosis onset reflects an earlier age of onset (18–25 years) in males compared to females (25–35 years) (Goldstein et al., 1989; Gureje, 1991; Thorup et al., 2007a,b). Evidence suggests that psychosis onset before age 18 is associated with a more chronic illness course, more severe psychotic symptoms and more severe cognitive impairments (de Girolamo et al., 2012; Mirzakhani et al., 2013; Walker et al., 2004; Yung et al., 2007). In CHR populations, younger age at onset of CHR syndromes is associated with higher transition rates to psychosis (Yung et al., 2007) and reports of more severe odd beliefs, delusions of reference, unusual perceptions, odd behavior, auditory hallucinations, and physical anhedonia (Bora and Arabaci, 2009; Paino-Pineiro et al., 2008).

1.3. Education

Level of education is most often reported only as a sample characteristic, rather than a variable relevant to illness presentation. Yet, studies of the relation of education with symptom presentation in schizophrenia-spectrum disorders indicate that lower education is associated with more negative symptoms (McGlashan and Fenton, 1992) and poorer prognoses (Wieselgren and Lindstrom, 1996). Studies of those with psychosis have also found that completion of high school (Austin et al., 2013) and generally achieving higher levels of education (Chang et al., 2012; Verma et al., 2012) are predictive of recovery from psychotic illness. Ruhrmann et al. (2010) demonstrated that lower education was a significant predictor of conversion to psychosis in a CHR sample.

1.4. The present study

The North American Prodrome Longitudinal Study (NAPLS) is a multisite study aimed at identifying predictors of the transition to psychosis. NAPLS has a large database of longitudinally followed CHR cases and provides a unique opportunity to examine demographic correlates of symptoms. The present study utilizes the NAPLS-II CHR cohort and focuses on the five SOPS positive prodromal symptoms; unusual thought content, suspiciousness, grandiosity, perceptual abnormalities, and disorganized communication. Our focus is restricted to the positive symptom domain because it is primarily the severity of these symptoms that determines whether individuals are designated as being at CHR for psychosis.

Based on the literature, it is hypothesized that males will demonstrate more disorganized communication, and females will manifest more severe perceptual abnormalities, and suspiciousness. Further, it is hypothesized that younger individuals will exhibit more severe positive symptoms and educational level will be inversely correlated with symptom severity.

2. Method

2.1. Participants

The current sample, recruited for the NAPLS-II study includes 356 CHR individuals. Sample demographic characteristics are presented in Table 1. Participants were excluded from NAPLS-II if at baseline they 1.) met DSM-IV criteria for an Axis I psychotic disorder; 2.) experienced a significant head injury; 3.) met substance dependence criteria within the past 6 months; 4.) had a neurological disorder; or 5.) had a Full Scale IQ < 70. More detailed information on the CHR sample is presented in previous reports (Addington and Heinssen, 2012; Addington et al., 2012). Participants were recruited from clinical practitioners as well as newspaper, bus, and online announcements. The current protocol was approved by Institutional Review Boards at all NAPLS sites, and all participants provided informed consent for minors.

2.2. Measures

2.2.1. Prodromal symptomatology

Participants were designated as CHR using the Structured Interview for Prodromal Syndromes (SIPS, Miller et al., 2003). Interview responses

Table 1
Demographic and characteristics and baseline SIPS symptom scores for CHR sample.

Variable	CHR (n = 356)
Age (mean ± SD)	18.9 ± 4.2
Age range	12–35 years
N < 18 years	155
Sex (n, %)	
Male	208 (58.4%)
Female	148 (41.6%)
Years of education (mean ± SD)	
Male	11.6 ± 2.5
Female	11.5 ± 2.9
Total	11.6 ± 2.6
SOPS P1 symptoms (mean ± SD)	3.31 ± 1.4
SOPS P2 symptoms (mean ± SD)	2.93 ± 1.5
SOPS P3 symptoms (mean ± SD)	1.0 ± 1.3
SOPS P4 symptoms (mean ± SD)	2.9 ± 1.5
SOPS P5 symptoms (mean ± SD)	1.8 ± 1.5
SOPS P total (mean ± SD)	12.0 ± 4.1
Medication (n on meds, %)	
Antipsychotics	62 (18%)
Antidepressants	94 (28%)
Stimulants	18 (5%)
Mood stabilizers	12 (4%)

Note. P1 = unusual thought content; P2 = suspiciousness; P3 = grandiosity; P4 = perceptual abnormalities; P5 = disorganized communication.

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