Psychiatry Research 252 (2017) 289–295

Contents lists available at ScienceDirect

Psychiatry Research

journal homepage: www.elsevier.com/locate/psychres

Schizophrenia spectrum personality disorders in psychometrically identified schizotypes at two-year follow-up

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ABSTRACT

Earlier (Bolinskey et al., 2015), we reported that psychometrically identified schizotypes displayed greater symptom levels and higher incidences of schizophrenia spectrum (schizotypal, schizoid, paranoid, and avoidant) personality disorders (PDs). In this study, 49 schizotypes and 39 matched controls participated in follow-up assessments after two years. Participants were previously identified as schizotypes or controls based on scores on the Chapman Psychosis Proneness Scales (CPPS), and were interviewed at baseline and follow-up with the Personality Disorder Interview for DSM-IV (PDI-IV). At follow-up, schizotypes displayed significantly higher symptom levels compared to controls, with medium to large effects, and appeared to meet criteria for diagnosis of each PD more often than controls, although significant differences were only observed for paranoid PD. Overall, schizotypes were more likely to have met criteria for a diagnosis at either baseline or follow-up. Finally, we observed a widening disparity over time between schizotypes and controls in avoidant and schizoid PDs. These results suggest that schizophrenia spectrum PDs, as well as subthreshold symptoms of these disorders, can represent a greater liability for schizophrenia in individuals identified as at-risk on the basis of psychometric means only. Furthermore, these findings demonstrate that such differences persist, and in some cases increase, over time.

1. Introduction

Previously (Bolinskey et al., 2015), we reported significantly greater numbers of symptoms of paranoid, schizoid, schizotypal, and avoidant personality disorders (PDs), as well as a significantly higher incidence rate of meeting diagnostic criteria for each of the disorders at baseline among psychometrically identified schizotypic individuals in comparison to a matched comparison sample. These results were important in advancing the idea that normally functioning individuals with liability for schizophrenia as defined by psychometric schizotypy display subthreshold symptoms of schizophrenia spectrum PDs. We also added to the evidence base for inclusion of avoidant PD as a schizophrenia spectrum PD by demonstrating stronger display of its symptoms in our psychosis-prone group than in our controls. With this follow-up report, we aimed to find additional support for schizophrenia spectrum PDs in individuals at risk for developing schizophrenia by examining these traits in both samples at two-year follow up. Beyond this, we hoped to observe a widening disparity between schizotypes and matched controls, thereby extending our previous findings to demonstrate that schizophrenia onset occurs in a developmental process that involves at-risk individuals displaying increasing psychopathology on a specific trajectory that can be documented over time.

1.1. Background

The development of schizophrenia is associated with increased

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http://dx.doi.org/10.1016/j.psychres.2017.03.014
Received 2 September 2016; Received in revised form 5 December 2016; Accepted 6 March 2017
Available online 08 March 2017
0165-1781/

signs of certain PDs in those thought to possess increased liability for the disorder. Historical study of schizophrenia spectrum disorders (SSDs) has revealed that the genetic underpinnings of the illness display themselves in those who are at risk for, but do not necessarily develop, schizophrenia, and that these displays overlap with pathological personality traits. One such avenue of discovery was the observation of individuals with schizophrenia and their relatives, who often display attenuated signs of the disorder, including odd or eccentric personality and withdrawal from others (Bleuler, 1950; Gottesman, 1991; Kraepelin, 1909/, 1971). More recent formal family studies confirm the association between schizophrenia and PDs, including schizotypal PD, in families (Kendler et al., 1993) and that higher degrees of genetic relatedness to relatives with schizophrenia are associated with higher rates of schizotypal symptoms (Torgersen, 1985). Additionally, siblings of individuals with schizophrenia exhibit symptoms of Cluster A PDs at a greater rate compared to healthy controls (Torti et al., 2013).

The Cluster A PDs have also been found to be present in the prodromal phase of schizophrenia (Solano and De Chávez, 2000). Conceptually, the Cluster A disorders represent the intermediate of a continuum of schizophrenic pathology, composed of mild traits on one extreme and frank psychosis on the other. Schizophrenia appears to fall along the same etiological spectrum as paranoid, schizoid, and schizotypal PDs, with the shared neurodevelopmental aberrations that result in either disorders of premorbid adjustment or as Cluster A PDs. Meehl (1990) also posited that premorbid Cluster A PDs may be associated with a greater genetic diathesis for schizophrenia and consequentially, a poorer prognosis and course. Increasingly, avoidant PD is also recognized as a possible indicator of risk, with comparable premorbid rates of this disorder to those of Cluster A PDs in individuals with schizophrenia (Solano and De Chávez, 2000). Avoidant PD symptoms also occur in relatives of individuals with schizophrenia at higher rates than in controls, even when controlling for the presence of paranoid and schizotypal PDs (Fogelson et al., 2007), and these symptoms are related to poorer neurocognitive performance in relatives (Fogelson et al., 2010).

The association between these PDs and schizophrenia might represent evidence for the idea of schizophrenia as a developmental process. As such, premorbid personality characteristics might represent endophenotypes of schizophrenia, in that they signal the underlying genetic vulnerability prior to the onset of illness, are stable and are often not readily available to the casual observer (Gottesman and Gould, 2003). Evidence supports the study of candidate endophenotypes through the use of psychometrically identified schizotypes, individuals living in the community without apparent functional deficits or impairing psychopathology but still possessing latent schizotypy that can be detected through psychological measures (Bolinskey et al., 2015).

Although there has been some argument regarding the acceptability of personality variables as endophenotypes (Savitz and Ramesar, 2006), we argue that personality traits may be considered as such. As noted previously, premorbid personality traits both aggregate and cosegregate within families (Torgersen, 1985; Torti et al., 2013). Because these traits may exist within individuals functioning in the community with no psychiatric complaints, they still may be considered to be internal phenotypes. In this study, the utilization of structured interviews to measure these personality variables allows for the precise quantification that is necessary for the meaningful study of endophenotypes.

1.2. Schizotypy

The term schizotypy, as introduced by Rado (1953) describes a syndrome of risk for schizophrenia, as well as a personality structure, occurring in those who exhibit attenuated signs and symptoms of schizophrenia without experiencing psychosis. Much of the current conceptualization of schizotypy rests on descriptions proposed by Meehl, (1962, 1990), who described *schizotypy* as the characteristic personality organization that results from the interaction of a genetic diathesis for schizophrenia with the environment. Whereas only a small subset of schizotypes will develop schizophrenia, all schizotypes will display some evidence of their underlying liability in the form of aberrant functioning in of four domains: cognitive slippage, interpersonal aversiveness, anhedonia, and ambivalence. Study-specific factors dictate the definition of the schizotype in current research practice, as family studies allow for the identification of schizotypes as relatives of those with schizophrenia. Alternatively, the use of psychometrically identified at-risk individuals allows for the ability to assess more subtle and latent schizotypy, including nonsymptomatic variants of the construct (Lenzenweger, 2010). The use of psychometric measures also allows for more precise quantification of schizotypy and its associated characteristics, as opposite to delineating groups based on genetic relatedness alone (Gooding et al., 2005).

Whereas schizotypy was initially described as a taxonic (Meehl, 1962), recent evidence supports a dimensional construct (Grant et al., 2015). Current models of schizotypy are multidimensional (Fonseca-Pedrero et al., 2014) with some convergence on the notion of a positive (or cognitive-perceptual) dimension and a negative (or interpersonal) dimension (Chan et al., 2015; Cihan et al., 2015; Gross et al., 2014; Kwapil et al., 2008; Smith et al., 2016). Three-factor models include positive, negative, and disorganized dimensions (Boyda et al., 2013; Chen et al., 1997; Wuthrich and Bates, 2006), with four-factor models identifying a fourth paranoid dimension (Compton et al., 2009). Several have found evidence for independent positive and negative factors (Chan et al., 2015) and several recent reports have documented cross loading of social anhedonia onto positive and negative schizotypy (Cihan et al., 2015; Gross et al., 2014; Kwapil et al., 2008; Smith et al., 2016) suggesting an anhedonic schizotypic core.

1.3. Identifying liability to schizophrenia

In research on liability to SSDs, researchers have employed various definitions of schizotypy, including genetic relatedness in family studies (Gottesman, 1991), clinically observable signs and symptoms associated with premorbid schizophrenia (Correll et al., 2010), and PDs that are demonstrably predictive of SSDs (Bolinskey and Gottesman, 2010). Extensive research has also been employed toward validating self-report questionnaires that can identify schizotypy in the general population. These include the Schizotypal Personality Questionnaire (SPQ; Raine, 1991) and the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason et al., 1995). The Chapman Psychosis Proneness Scales (CPPS) have gained considerable support in the literature for their validity in predicting mental health outcomes, and thus have been widely used as the benchmarks for identifying schizotypy in studies examining putative endophenotypes of schizophrenia.

The CPPS were developed based on Meehl's, (1962, 1990) conceptualization of schizotypy, and to reflect the heterogeneity in SSDs (Chapman et al., 1980). Rather than providing a unidimensional estimation of one's liability to SSDs, the CPPS include separate scales that measure specific domains within a constellation of signs and symptoms that indicate liability to psychosis. These scales are: the Perceptual Aberration Scale (*PerAb*; Chapman et al., 1978), a measure of sensory and body-image distortions, the Magical Ideation Scale (*MagId*; Eckblad and Chapman, 1983), which measures delusional or odd beliefs, and the Revised Physical Anhedonia Scale (*PhysAnh*; Chapman et al., 1976), which captures lack of physical or sensory pleasure. Additionally, the Revised Social Anhedonia Scale (*SocAnh*; Eckblad et al., 1982) measures inability to find pleasure in social relationships.

The CPPS is one of the most widely used assessment tools in research examining liability to schizophrenia-spectrum illness