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Social functioning in individuals at clinical high risk for psychosis

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Abstract

Poor social functioning is a hallmark of schizophrenia. The purpose of this study was to examine social functioning in individuals at clinical high risk for psychosis. Social functioning was assessed in a sample of 86 clinical high risk (CHR) individuals and compared to that of 50 first-episode of psychosis (FE) subjects, 53 multi-episode schizophrenia subjects (ME) and 55 non-psychiatric controls (NPC). Subjects were assessed on the Social Functioning Scale (SFS), the Role Functioning subscale of the Quality of Life Scale (QLS-role), and the premorbid functioning scale. On the SFS, the CHR group did not differ significantly from the FE and ME groups and all were impaired relative to the NPCs. On QLS-role, the CHR group performed significantly better than the ME patients and significantly worse than NPCs. CHR subjects did not differ from patients in terms of premorbid functioning. This study demonstrates that even at the pre-psychotic phase of the illness, these young people are demonstrating significant deficits in social functioning, supporting that social deficits are present long before the onset of psychotic symptoms.

Keywords: Clinical high risk; Prodrome; Early psychosis; Schizophrenia; Social functioning; Role functioning

1. Introduction

Poor social functioning is a hallmark of schizophrenia (Couture et al., 2006). For many individuals, in fact, it possibly is even more debilitating than and certainly more stable than the positive symptoms that mark the onset of the illness. Furthermore, there are suggestions that deficits in social functioning are present long before the onset of the first psychotic episode and such deficits are often prognostic of later social functioning (Addington & Addington, 2005; Hafner et al., 1999; Davidson et al., 1999). However, some of these studies are retrospective (e.g. Hafner et al.) with a focus on functioning in the period before the onset of the illness and other studies are prospective (e.g., the high risk studies or epidemiological studies) examining social functioning in the pre-adolescent period well before the onset of full psychosis (Cannon et al., 1999, 2002; Jones et al., 1994; Schiffman et al., 2004a,b).

There are few prospective studies examining those who are at clinical high risk (CHR) of developing psychosis, i.e.

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individuals in the putatively prodromal phase of the illness. An association between low or deteriorated functioning and onset of psychosis has been reported (Mason et al., 2004; Yung et al., 2003, 2004). For example, Yung and colleagues reported that a Global Assessment of Functioning (GAF) score of 50 or below at baseline was associated with psychosis at 12 month follow-up (Yung et al., 2003). In a small sample, Penn and colleagues demonstrated that CHR subjects had significantly impaired social skills relative to normal controls and did not differ from those in the early stages of a psychotic illness (Pinkham et al., 2007). A recent study that examined subjective experience of functioning (particularly in school and work settings) demonstrated that young CHR individuals were similar to first-episode adolescents and impaired relative to normal controls (Ballon et al., 2007).

Thus, it would be important to determine the level of social functioning in a large sample of individuals who are seen to be at clinical high risk of psychosis using measures that are well established and specifically designed for measuring social functioning in schizophrenia. The aim of this paper is to compare both premorbid and social functioning in a large sample of CHR subjects with the functioning of non-psychiatric controls, first-episode psychosis patients and multi-episode schizophrenia patients.

2. Method

2.1. Subjects

The sample consisted of 86 clinical high risk individuals (CHR), 50 individuals with a first-episode of psychosis (FE), 53 subjects with a chronic course of schizophrenia (ME) and 55 non-psychiatric controls (NPC). All CHR subjects are participants in the PREDICT study at the University of Toronto ($n=34$), the University of North Carolina at Chapel Hill (UNC) ($n=32$) and Yale University ($n=20$), a three site study determining predictors of conversion to psychosis. All CHR subjects met the Criteria of Prodromal States (COPS) as evaluated using the Structured Interview for Prodromal Syndromes (SIPS) (Miller et al., 2003). The COPS includes 3 criteria: attenuated positive symptom state (APS), brief intermittent positive symptoms (BIPS) and genetic risk and deterioration (GRD). The APS and BPS criteria are based on duration and severity of prodromal symptoms and the GRD requires either a first degree relative with a psychotic disorder or the subject having schizotypal personality disorder (SPD) plus at least a 30% drop in functioning on the General Assessment of Functioning (GAF) scale in the past 12 months. Because social functioning is part of the GRD criteria we only included subjects who met Attenuated Positive Symptom State Criteria, which included the emergence or worsening over the past year of a non-psychotic disturbance of thought content, thought process or perceptual abnormality. None of the CHR subjects met any DSM-IV criteria for any psychotic disorders.

The FE, ME and NPC subjects were specifically recruited for studies examining social functioning in psychosis at the University of Calgary and have been well described elsewhere (Addington et al., 2005, 2006a,b). Using the SCID, all of the FE and ME subjects met DSM-IV criteria for a schizophrenia spectrum disorder (schizophrenia, schizoaffective disorder, schizophreniform) except nine FE subjects who met criteria for other psychotic disorders (delusional disorder, brief psychotic disorder, psychosis NOS). Based on SCID criteria there were no current or past psychiatric disorders in the NPCs. Demographics are presented in Table 1.

Table 1
Group differences in demographics

	CHR	FE	ME	NPC	F value of ANOVA
	$N=86$	$N=50$	$N=53$	$N=55$	
Demographics					
Age: mean (SD)	19.4 (4.5)[b]	25.1 (8.0)[a]	35.5 (7.2)[a]	21.7 (6.0)[b]	$F=79.37$***
% male	57%	60%	72%	60%	NS
% completed high school	53.7%	66.0%	71.7%	72.2%	NS
Race					
Caucasian	83.7%	78.0%	92%	92.7%	NS
African American	7%	4.0%	0%	1.8%	
Other	9.3%	18.0%	8%	5.4%	

*$p<0.05$, **$p<0.01$, ***$p<0.0001$.
[a]Significantly different from other groups.
[b]Not significantly different from each other.

2.2. Measures

Social functioning was assessed using the Social Functioning Scale (SFS), a self-report questionnaire developed for outpatients with schizophrenia that has excellent psychometric properties (Birchwood et al., 1990). The SFS has a total score and 7 sub-scores: Withdrawal/social engagement, Interpersonal communication, Independence–performance, Independence–competence, Recreation, Prosocial, and Employment/Occupation. To better assess role functioning, we also used the instrumental role functioning subscale of the Quality of Life Scale (QLS) (Heinrichs et al., 1984). Premorbid Functioning was assessed with the Premorbid Adjustment Scale (PAS) (Cannon-Spoor et al., 1982). The PAS measures premorbid functioning in four areas of development: (i) sociability/withdrawal, (ii) peer relationships, (iii) ability to function outside the nuclear family, and (iv) capacity to form intimate socio-sexual ties, at each of four developmental stages, namely, childhood (up to age 11), early adolescence (12–15 years), late adolescence (16–18 years), and adulthood (19 and up) (van Mastrigt and Addington, 2002). Overall scores on the PAS are an average of the developmental periods that are rated. Information for all three measures of social functioning was obtained from the subject.

2.3. Procedures

Formal consent was obtained from all subjects. In the PREDICT study, all three sites participated in a rater training program developed at Yale University that teaches clinical researchers to identify features of the prodromal syndrome with good reliability (Miller et al., 2003). The kappa statistic was used to compare trainee agreement with the "gold standard" diagnosis of presence or absence of a prodromal syndrome. Kappa was greater than 0.80 at all sites and the overall kappa was 0.90. All sites participated in weekly conference calls chaired by JA to review criteria for every CHR case admitted to the study. Raters were trained on the SCID at each site by the respective PIs. However, the thorough review of all attenuated symptoms on the consensus calls ruled out the presence of any symptoms at a psychotic level.

The DSM-IV diagnoses for the Calgary subjects were made using the SCID-I by JA and DA. Interrater reliability was determined by 100% agreement on the diagnosis and at least 80% agreement for symptom presence. Other detailed descriptions of quality training and good to excellent reliability for the data from the control subjects have been described elsewhere (Addington et al., 2006a).

2.4. Statistical analysis

One-way ANOVAs were used to compare the four groups on demographics. Pearson correlations were used to assess the relationship of the two scales to one another. One-way between-groups MANOVA was used to compare groups on the two measures of functioning controlling for age. One-way ANOVAS were used to compare groups on social functioning measures, including subscales. On all ANOVAs, Tukey post-hoc tests were used to determine specific group differences.

3. Results

One-way ANOVAS demonstrated that there were significant differences amongst all groups on age except between the CHR and NPC group. These results are presented in Table 1.

The SFS and the QLS-role were significantly associated ($r=0.43$, $p<0.0001$) in the total sample; not significantly associated in the NPCs and MEs and significantly associated in the FEs ($r=0.49$, $p<0.001$) and in the CHRs ($r=0.42$, $p<0.001$). This result is not surprising as the two measures are measuring different aspects of social functioning. However, the QLS-role was significantly associated in each group with the employment sub-score of the SFS (r ranged from 0.66 to 0.0.72, $p<0.001$).

A one-way between-groups MANOVA was performed to determine group differences on the two measures of social functioning controlling for age. There was a statistically significant difference between groups on the combined dependent variables: $F(4, 240)=30.12$; $p=0.0001$; Wilks' Lambda = 0.64; partial eta squared = 0.20. Both the SFS: $F(2, 242)=42.86$; $p=0.0001$; partial eta squared = 0.26 and the QLS-role: $F(2, 242)=33.89$; $p=0.001$; partial eta squared = = 0.22 were statistically significant. The one-way ANOVA (see Table 2) demonstrates that on the SFS and the QLS-role, the NPCs performed significantly better than the three other groups. On the SFS overall and most of the sub-scores there were no significant differences between the CHR, FE and ME groups. There were variations on ratings on four of the sub-scores, Employment, Independence–competence, Independence–performance and Prosocial. On Employment, although the CHR group had significantly lower ratings than the NPC group, they were significantly better than the patient groups. On Independence–performance, the ME and NPC performed significantly better than the FE and CHR with all of the groups scoring in a range that is not indicative of problems. On Independence–competence, the CHR had the highest ratings followed by the NPC with no significant difference between ME and FE groups. On Prosocial, the CHR group

Table 2
Group differences in social functioning

	CHR	FE	ME	NPC	*F* value or *T* value
	N=86	*N*=50	*N*=53	*N*=55	
Social Functioning Scale					
Withdrawal/engagement	10.69 (2.71)	10.04 (2.83)	10.51 (2.07)	12.67 (1.47)[a]	*F*=12.98***
Interpersonal communication	7.31 (1.73)	6.88 (1.83)	7.40 (1.43)	8.80 (0.56)[a]	*F*=16.83***
Independence–performance	25.40 (6.38)[b]	26.86 (6.29)[b]	31.47 (5.74)[c]	31.91 (5.34)[c]	*F*=19.43***
Independence–competence	34.58 (4.92)[a]	20.54 (6.55)[d]	23.19 (6.28)[d]	26.07 (5.38)[a]	*F*=82.89***
Recreation	20.72 (6.75)	22.20 (12.35)	22.60 (10.93)	34.55 (10.65)[a]	*F*=24.84***
Prosocial	17.49 (8.74)[a]	36.16 (3.64)	36.11 (4.14)	37.85 (1.69)	*F*=204.29***
Employment/Occupation	8.43 (2.86)[a]	6.46 (3.27)	5.25 (3.12)	9.80 (0.59)[a]	*F*=31.50***
SFS total score	125.29 (22.77)	129.14 (27.31)	136.53 (22.06)	161.65 (20.23)[a]	*F*=30.61***
QLS-role	11.87 (5.29)[b]	9.93 (6.30)	8.04 (5.74)[a]	16.70 (3.37)[a]	*F*=26.78***
Premorbid Functioning					
Childhood	0.19	0.23	0.29	N/A	NS
Early adolescence	0.26	0.28	0.23	N/A	NS
Late adolescence	0.29	0.36	0.34	N/A	NS
Adult	0.24[a]	0.38	0.40	N/A	*F*=10.71***
Overall total score	0.25	0.31	0.27	N/A	NS

*$p<0.05$, **$p<0.01$, ***$p<0.0001$.
[a]Significantly different from other groups.
[b]Significantly different from ME and NPC.
[c]Significantly different from CHR and FE.
[d]Significantly different from CHR and NPC.

was significantly better than the other three groups. On the QLS-role, the CHR group performed similar to the FE group, significantly poorer than the NPC and significantly better than the MEs. These results are presented in Table 2.

On the Premorbid Functioning Scale (PAS), there were no significant differences between the CHR group and the patient groups on the scores for childhood, early adolescence and late adolescence and overall premorbid functioning. However, on the adult scale, the CHR subjects performed significantly better. It should be noted that 44% of the CHR group and 24% of the FE group were under 19 and did not have adult premorbid ratings. This however, is not reflected in the overall score, which is based only on developmental periods that have been reached. See Table 2.

4. Discussion

This study is one of the first to examine social functioning in a group of individuals at high risk of developing psychosis in comparison to non-psychiatric controls, first-episode psychosis subjects and patients with a more established schizophrenia illness. Results of this study confirm that these young CHR individuals have clear deficits in social and premorbid functioning equivalent to individuals with FE and ME psychosis and schizophrenia. Results also demonstrate equivalent patterns of premorbid functioning. The poorer adult ratings of the ME and FE subjects possibly reflect current functioning and that less of the CHR subjects reached this developmental period.

Overall ratings of social functioning suggest that the CHR groups are performing at an equivalent level to the patient groups. For role functioning and employment, although the CHR group are on average not functioning as well as non-psychiatric peers, they are not yet at an equivalent level to patients. In examining the subscales of social functioning, we can speculate that we are already seeing the withdrawal and poorer interpersonal communication typical of patients with psychosis as it is on these two subscales that the CHR subjects do not differ significantly from the patient groups. There is some variation on the other subscales that tend to reflect recreational and independent living skills in which individuals may engage. This suggests some impairment in the CHR group's performance and competence in independent living and in the ability to begin social interactions relative to non-psychiatric peers. Perhaps the onset of the prodromal symptoms is beginning for some to have an impact at this early stage on coping with daily living. This may in fact encourage help-seeking.

This study is limited in that it is cross-sectional and does not address predictors of conversion. Secondly, the "control" subjects are from a different site. However, the social functioning ratings of the control samples are consistent with the ratings reported in the literature from other research centers using these measures in both FE and ME groups (Dickerson et al., 1991, 1995; Pinkham et al., 2007). Thirdly, this is the first time to our knowledge that the SFS has been used with a clinical high risk sample and possibly needs further validation. The strengths of this study are the reasonably large numbers in each group, the well-defined clinical high risk group and the use of three control groups.

These CHR subjects are help-seeking and have significant disability, thus highlighting the importance of characterizing non-psychotic outcomes of the putatively prodromal period. Although these social deficits are not specific enough indicators of schizophrenia to support pharmacological intervention, there is a wide range of psychosocial interventions, which are relatively inexpensive, low risk and may offer some benefits for individuals at risk of psychosis. Although it is highly likely that less than 50% of this CHR sample will go on to develop a full blown psychotic illness, the attenuated positive symptoms are accompanied by levels of premorbid and current social functioning that is similar to that observed in individuals with schizophrenia. Thus, this suggests that this is a clinical sample that requires help in its own right. For those who do convert, psychosocial intervention at this early stage could potentially improve the course and outcome of the illness and for those who do not convert, intervention is much needed to improve the quality of their lives and reduce distress.

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Contributors

With respect to the PREDICT study Drs Addington, Perkins and Woods were responsible for the design of the study and the supervision of all aspects of data collection. Dr Penn contributed to the design and data collection with respect to the social functioning. For the data from the Calgary Social Cognition Study, Dr Jean Addington was responsible for the design and all aspects of the study and Donald Addington participated in part of the data collection and clinical assessments.

For this paper Dr Addington was responsible for data analysis and the writing of the manuscript with help in writing from Perkins, Woods, Penn and D. Addington.

All authors contributed to and approved the final manuscript.

Conflict of interest

There are no conflicts of interest for any of the authors with respect to the data in this paper or for the study.

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