Clinical and Sociodemographic Associates of Remission from Positive Symptoms in Schizophrenia

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Abstract

Objectives: To determine factors associated with remission from positive symptoms in Indian patients with schizophrenia.

Methods: We evaluated 151 patients (99 men and 52 women) aged 18 to 65 years who were diagnosed with schizophrenia and followed up for ≥ 6 months (with a minimum of two evaluations). We assessed psychopathology, the level of best functioning in the past year, premorbid functioning (up to 1 year), daily living skills, medication adherence, adverse effects to medications, the number of stressful events in the 6 months before illness onset, perceived social support, expressed emotion from family, and personal construct of empowerment. Remission from positive symptoms of schizophrenia was defined as simultaneous attainment of a score of ≤ 3 (mild) for ≥ 6 months in the following symptoms: delusions, concept disorganisation, hallucinatory behaviour, unusual thought content, mannerisms, and posturing. Patients were categorised as remitted and non-remitted.

Results: Of 151 patients, 81 (53.64%) fulfilled the remission criteria. Compared with non-remitted patients, remitted patients had a shorter duration of untreated psychosis ($t = -2.29$, $p < 0.05$), better premorbid functioning in childhood ($t = -1.99$, $p < 0.05$) and general ($t = -9.34$, $p < 0.001$) subscale, higher medication adherence ($t = 6.91$, $p < 0.001$), higher daily living skills ($t = 8.65$, $p < 0.001$), better perceived social support ($t = 6.69$, $p < 0.001$), higher empowerment ($t = 5.64$, $p < 0.001$), and received higher warmth ($t = 1.99$, $p < 0.05$) and lower hostility ($t = -4.00$, $p < 0.001$), dissatisfaction ($t = -6.96$, $p < 0.001$), and critical comments ($t = -2.48$, $p < 0.05$) from family members. Predictors of remission were duration of untreated psychosis ($B = -0.020$, $p < 0.05$), daily living skills ($B = 2.063$, $p < 0.001$), perceived social support ($B = 0.084$, $p < 0.01$), and dissatisfaction from family members ($B = -0.621$, $p < 0.01$).

Conclusions: 53.64% of patients with schizophrenia achieved remission from positive symptoms. Remission was more likely to occur in patients with shorter duration of untreated psychosis, better daily living skills, higher perceived social support, and less dissatisfaction from family members.

Key words: Remission induction; Schizophrenia; Social support

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Introduction

Schizophrenia used to be considered a chronic condition that eventually leads to a deterioration of clinical and functional status. The core feature of schizophrenia is a downhill course and eventual adverse outcome. DSM III stated that “a complete return to premorbid level of functioning in individuals diagnosed with schizophrenia is so rare as to cast doubt upon the accuracy of the diagnosis”.¹ However, the course of schizophrenia is heterogeneous and not necessarily a downhill one.²

Outcome is an ambiguous concept and is defined as the net balance of the clinical and functional descriptors at the endpoint. However, no such endpoint exists in dynamic conditions such as schizophrenia.³ There is no single parameter to assess the outcome, along with clinical symptoms, functionality, and social role performance.³ Newer parameters have been included in the concept of outcome, and rehabilitation or treatment satisfaction⁴ should also be considered.

The International Pilot Study of Schizophrenia⁵ investigated the nature of the illness using standardised methods and procedures to assess prognosis and illness course. In two Swiss studies of the long-term course of schizophrenia, a considerable proportion of patients achieved better outcome, with significant reduction in symptoms and a fair level of social and occupational functioning.^{2,6}

Predictors of outcome of schizophrenia have been studied^{7,8} and include neurological soft signs⁹ and mental

resilience.¹⁰ Concepts of remission¹¹ and recovery¹² have gained popularity, and newer medicines and rehabilitation methods (eg, empowering programme¹³) are developed.

The present study aimed to determine factors associated with remission from positive symptoms in Indian patients with schizophrenia. This study is a part of a larger study on outcomes of schizophrenia published previously.¹⁴

Methods

This cross-sectional retrospective study was approved by the ethics review board of the Central Institute of Psychiatry, Ranchi, India. Written informed consent was obtained from each patient. We evaluated 151 patients (99 men and 52 women) aged 18 to 65 years who were diagnosed with schizophrenia according to ICD-10-DCR¹⁵ and were on regular follow-up for ≥ 6 months (with a minimum of two evaluations). Patients with any comorbid major medical or neurological disorder, mental retardation or any comorbid psychiatric illness were excluded.

Psychopathology was assessed using the Positive and Negative Syndrome Scale (PANSS).¹⁶ The level of best functioning in the past year was assessed using the Global Assessment of Functioning.¹⁷ Premorbid functioning (up to 1 year) was assessed using the Cannon-Spoor Premorbid Adjustment Scale after modification (PAS).¹⁸ Daily living skills were assessed using the informant-rated version of the Independent Living Skills Survey (ILSS).¹⁹ Medication adherence was assessed using the Drug Attitude Inventory (DAI).²⁰ Adverse effects to medications were assessed using the Udvalg for Kliniske Undersogelser²¹ and by interview of the patients. The number of stressful events in the 6 months before illness onset was recorded using the Presumptive Stressful Life Event Scale,²² which is an Indian adaptation of Social Readjustment Rating Questionnaire.²³ Perceived social support was measured using the patient-rated PGI Social Support Questionnaire,²⁴ which is based on the Social Support Questionnaire.²⁵ Expressed emotion from family was assessed using the Attitude Questionnaire.²⁶ Personal construct of empowerment was assessed using the self-report Empowerment Scale,²⁷ with responses ranging from 1 (strongly agree) to 4 (strongly disagree).

Remission from positive symptoms of schizophrenia was assessed using the operationalised criterion proposed by the Remission in Schizophrenia Working Group.¹¹ This requires simultaneous attainment of a score of ≤ 3 (mild) for ≥ 6 months in the following symptoms of the PANSS: delusions, concept disorganisation, hallucinatory behaviour, unusual thought content, mannerisms, and posturing. Patients were categorised as remitted and non-remitted.

Data were analysed using SPSS (Windows version 10; IBM Corp, Armonk [NY], US). Normality of data was checked using Shapiro-Wilk test. The remitted and non-remitted groups were compared using the independent *t* test for continuous variables and the Chi-squared test for categorical variables. Logistic regression was conducted with remission as outcome variable, and predicting variables

were entered in the forward conditional method. Predictors included duration of untreated psychosis (DUP), severity of positive and negative symptoms, medication adherence, number of stressful events, expressed emotions, perceived social support, and empowerment. The assumption of lack of autocorrelation was tested with Durbin-Watson test. To identify multicollinearity, variance inflation factor was tested. The assumption of homoscedasticity was checked from the plots of standardised predicted values and standardised residuals. The Nagelkerke *R*² was calculated to measure the variance explained by the model.

Results

Of 151 patients, 81 (53.64%) fulfilled the remission criteria. Compared with non-remitted patients, remitted patients had a shorter DUP ($t = -2.29$, $p < 0.05$), better premorbid functioning in childhood ($t = -1.99$, $p < 0.05$) and general ($t = -9.34$, $p < 0.001$) subscale in PAS, higher medication adherence in DAI ($t = 6.91$, $p < 0.001$), higher daily living skills in ILSS ($t = 8.65$, $p < 0.001$), better perceived social support ($t = 6.69$, $p < 0.001$), higher empowerment ($t = 5.64$, $p < 0.001$), and received higher warmth ($t = 1.99$, $p < 0.05$) and lower hostility ($t = -4.00$, $p < 0.001$), dissatisfaction ($t = -6.96$, $p < 0.001$), and critical comments ($t = -2.48$, $p < 0.05$) from family members (Table 1).

Predictors of remission were DUP ($B = -0.020$, $\text{Exp}(B) = 0.980$, $p < 0.05$), ILSS score ($B = 2.063$, $\text{Exp}(B) = 7.873$, $p < 0.001$), perceived social support ($B = 0.084$, $\text{Exp}(B) = 1.088$, $p < 0.01$), and dissatisfaction from family members ($B = -0.621$, $\text{Exp}(B) = 0.538$, $p < 0.01$) [Table 2]. The model explained 61.8% of the variance (adjusted $R^2 = 0.618$) in remission.

Discussion

53.64% of the patients fulfilled the remission criteria, which have good sensitivity and specificity.²⁸ The symptomatic remission rate has been reported to be 37.5%²⁹ and 91.5%.³⁰ Nonetheless, the proportion of patients showing enduring remission is smaller than that showing symptomatic remission for ≥ 6 months.³⁰ The favourable outcomes of our patients may be because our institute is a renowned institute in India, or because only patients with regular follow-up were included. Generalisation of our findings should be done with caution, as this was a hospital-based study and many patients in the community do not receive any professional help.

Perceived social support and ILSS score positively predicted remission. Social support is believed to be bidirectional and is often determined by personality factors such as self-esteem, sociability, and locus of control.³¹ Two components determine the overall social support: individual's own inner resources and characteristics (physical characteristics, biological predisposition, and cognitive capacity to acquire and organise knowledge of self and others) and individual's external social environments.³²

Table 1. Characteristics of patients

	Remitted (n=81)*	Non-remitted (n=70)*	t/ χ^2	p Value
Age, y	35.12 $\pm$ 10.04	33.62 $\pm$ 9.61	0.93	0.354
Years of education	10.90 $\pm$ 4.63	10.24 $\pm$ 4.20	0.91	0.365
Age of onset, y	27.72 $\pm$ 8.75	25.56 $\pm$ 8.47	1.53	0.128
Duration of illness, y	7.61 $\pm$ 8.47	8.13 $\pm$ 6.15	-0.55	0.584
Duration of untreated psychosis, m	8.84 $\pm$ 15.41	18.00 $\pm$ 32.04	-2.29*	0.024
Duration of hospitalisation, d	21.47 $\pm$ 38.03	23.24 $\pm$ 38.96	-0.28	0.778
Number of hospitalisation	0.53 $\pm$ 0.84	0.57 $\pm$ 0.73	-0.31	0.754
Dose of medication in chlorpromazine equivalence	329.87 $\pm$ 87.83	340 $\pm$ 99.29	-0.65	0.520
Total duration on medication, y	6.05 $\pm$ 4.81	5.69 $\pm$ 5.62	0.43	0.670
Duration of follow-up, y	3.01 $\pm$ 3.01	2.89 $\pm$ 3.51	0.20	0.839
Number of follow-up	8.01 $\pm$ 6.40	7.69 $\pm$ 8.51	0.27	0.789
Interval of follow-up, y	0.36 $\pm$ 0.21	0.37 $\pm$ 0.29	-0.28	0.780
Sex			0.52	0.470
Male	51 (62.96)	48 (68.57)		
Female	30 (37.04)	22 (31.43)		
Religion			1.39	0.238
Hindu	69 (85.18)	64 (91.43)		
Non-Hindu	12 (14.82)	6 (8.57)		
Ethnicity			1.74	0.187
General	73 (90.12)	67 (95.71)		
Tribal	8 (9.88)	3 (4.29)		
Marital status			0.08	0.775
Married	47 (58.02)	39 (55.71)		
Single	34 (41.98)	31 (44.29)		
Income			3.39	0.183
Upper	3 (3.70)	2 (2.86)		
Middle	63 (77.78)	46 (65.71)		
Lower	15 (18.52)	22 (31.43)		
Family type			0.48	0.491
Nuclear	53 (65.43)	42 (60.00)		
Joint	28 (34.57)	28 (40.00)		
Access to medical care			2.56	0.279
Good	23 (28.39)	13 (18.57)		
Medium	48 (59.26)	44 (62.86)		
Poor	10 (12.35)	13 (18.57)		
Residence			1.91	0.167
Rural	36 (44.44)	39 (55.71)		
Urban	45 (55.56)	31 (44.29)		
Medication route			1.90	0.168
Depot	27 (33.33)	31 (44.29)		
Oral	54 (66.67)	39 (55.71)		
Medication type			0.97	0.616
Typical	4 (4.94)	5 (7.14)		
Atypical	36 (44.44)	27 (38.57)		
Both	41 (50.62)	38 (54.29)		

* Data are presented as mean $\pm$ standard deviation or No. (%) of patients

Table 1. (cont'd)

	Remitted (n=81)*	Non-remitted (n=70)*	t/ χ^2	p Value
Occupation			2.77	0.251
Employed	20 (24.69)	14 (20.00)		
Unemployed	15 (18.52)	21 (30.00)		
Student/housewife	46 (56.79)	35 (50.00)		
Response to treatment			4.15	0.126
Poor	17 (20.99)	13 (18.57)		
Partial	15 (18.52)	23 (32.86)		
Good	49 (60.49)	34 (48.57)		
Global Assessment of Functioning	74.94 $\pm$ 0.55	56.93 $\pm$ 6.49	24.89	<0.001
Modified Premorbid Adjustment Scale				
Childhood (n=151)	0.03 $\pm$ 0.04	0.05 $\pm$ 0.05	-1.99	0.048
Early adolescence (n=149)	0.06 $\pm$ 0.04	0.07 $\pm$ 0.04	-1.43	0.155
Late adolescence (n=136)	0.07 $\pm$ 0.04	0.08 $\pm$ 0.06	-1.77	0.079
Adult (n=119)	0.05 $\pm$ 0.08	0.07 $\pm$ 0.08	-1.46	0.148
General (n=151)	0.19 $\pm$ 0.08	0.38 $\pm$ 0.15	-9.34	<0.001
Udvalg for Kliniske Undersogelser	4.69 $\pm$ 4.58	5.18 $\pm$ 3.16	-0.71	0.476
Drug Attitude Inventory	8.04 $\pm$ 1.73	5.54 $\pm$ 2.66	6.91	<0.001
Independent Living Skills Survey	3.15 $\pm$ 0.48	2.34 $\pm$ 0.66	8.65	<0.001
No. of stressful events in the 6 months before onset	1.73 $\pm$ 1.30	2.01 $\pm$ 1.39	-1.29	0.196
Perceived social support	54.73 $\pm$ 8.36	44.50 $\pm$ 10.43	6.68	<0.001
Expressed emotions				
Critical comments	5.74 $\pm$ 0.83	6.11 $\pm$ 1.01	-2.48	0.014
Hostility	6.22 $\pm$ 0.55	6.69 $\pm$ 0.86	-4.00	<0.001
Dissatisfaction	8.21 $\pm$ 1.02	9.53 $\pm$ 1.30	-6.96	<0.001
Emotional overinvolvement	11.75 $\pm$ 0.86	11.53 $\pm$ 1.20	1.33	0.184
Warmth	8.12 $\pm$ 0.95	7.81 $\pm$ 0.95	1.99	0.049
Empowerment	78.21 $\pm$ 9.50	69.04 $\pm$ 10.45	5.64	<0.001

* Data are presented as mean $\pm$ standard deviation or No. (%) of patients

Table 2. Logistic regression analysis for predictors of remission in patients with schizophrenia*

Variable	B	Standard error	exp b (95% confidence interval)	p Value
Constant	-4.19	2.60	0.02	-
Independent Living Skills Survey	2.06	0.44	7.87 (3.31-18.75)	<0.001
Perceived Social Support	0.08	0.03	1.09 (1.03-1.15)	<0.01
Duration of untreated psychosis	-0.02	0.01	0.98 (0.96-0.99)	<0.05
Dissatisfaction	-0.62	0.20	0.54 (0.36-0.79)	<0.01

* $R^2 = 0.618$ (Nagelkerke); Model $\chi^2 = 59.53$, $p < 0.001$

Symptoms, particularly if severe and long-standing, may produce more lasting deficits on the provision of support by family members.³¹ Schizophrenia is a chronic illness and thus affects social outcome early in the course. Higher social support, better coping and social support seeking³³

have been shown to improve outcome. Satisfaction with social support positively influences the quality of life in schizophrenia patients.³⁴

ILSS measures social, occupational, leisurely functions, and skills for daily living. Adequate heterosexual

contacts and instrumental competence social adjustment occupational functioning affect outcome.³⁵ Social cognition, which is the connecting link between symptomatic improvement and adequate socio-occupational functioning, is increasingly targeted in treatments of schizophrenia. Nowadays, the goal of treatment in schizophrenia is remission and recovery. Achieving adequate socio-occupational functioning is an essential step towards it. Independent functioning at various levels has a bilateral relation with clinical symptoms, as both tend to negatively influence each other.

Dissatisfaction in family members negatively predicted remission. Expressed emotions may be predictive of relapse and re-hospitalisations in schizophrenia patients. Expressed emotions may differentially affect psychosocial functioning and not much clinical functioning.³⁶ Expressed emotions, specifically dissatisfaction, are associated with poor socio-occupational functioning in schizophrenia.³⁷ The degree and frequency of expressed emotions can change with time, and expressed emotions tend to predict relapse better with long-standing illness. Expressed emotions are a valid prolonged predictor of relapses and rehospitalisations.³⁸

DUP predicts remission^{9,32} and a favourable outcome (PANSS score).³⁹ A short DUP is associated with better social, occupational, and symptomatic outcome.⁴⁰ A meta-analysis concluded that DUP had a small but consistent correlation with poor general symptomatic outcome, more severe positive and negative symptoms, less likelihood of remission, and poor social functioning and global outcome.⁴¹ Longer DUP predicts worse clinical, functional, and cognitive outcomes in early-onset psychosis⁴² and predicts social anxiety in schizophrenia, which adversely affects outcome.⁴³ DUP is an important parameter in India where health care system struggles to reduce the overall treatment gap in schizophrenia. Despite the presence of other protective factors, DUP alone can adversely impact the outcome of schizophrenia by worsening symptomatic and functional outcome through its influence on social cognition and social anxiety. Thus, early intervention in schizophrenia helps to improve the patient outcome.

Negative symptoms have been reported to be a predictor (negative) of remission in schizophrenia, along with participation in standardised psychological treatment,³⁰ favourable early response to treatment, general psychopathological symptoms, and lesser psychotic episodes in the longitudinal course.²⁹ However, negative symptoms or general psychopathology symptoms was not a predictor of remission in the present study.

One of the limitations of the present study is the homogeneity of the sample. Patients with comorbid illnesses (eg, obsessive-compulsive disorder, major depression, substance dependence) were excluded; these comorbid illnesses could be important predictors. The study is cross-sectional and retrospective. A study with a baseline assessment followed by prospective evaluations would have identified more predictors. A community-based study could have examined patients who could not reach

out to hospitals. Assessment of family dynamics, expressed emotions, housing and living conditions, and social support in patients could have helped determine the real picture of outcomes of schizophrenia in India. Studies of psychosocial and biological parameters among patients in the community with a prospective design are warranted. The number of relapses in the past among patients could not be tracked, which could have been an important predictor.

Conclusion

53.64% of patients with schizophrenia achieved remission from positive symptoms. Remission was more likely to occur in patients with shorter duration of untreated psychosis, better daily living skills, higher perceived social support, and less dissatisfaction from family members.

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