Recovery From Schizophrenic Psychoses Within the Northern Finland 1966 Birth Cohort

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Background: Because of widely disparate findings from follow-up studies, the likelihood of recovery from schizophrenia remains controversial. We report the extent of recovery from schizophrenia in a population-based cohort.

Method: Subjects with psychotic disorders were recruited from the Northern Finland 1966 Birth Cohort. Of the 91 subjects who agreed to participate, 59 were diagnosed with schizophrenia and 12 were diagnosed with schizophrenia spectrum disorders (schizophreniform psychosis, schizoaffective or delusional disorder) by DSM-III-R criteria. Diagnoses were established by interviewing the subjects, checking the Finnish Hospital Discharge Register, and reviewing their medical records. To assess recovery, we used the Clinical Global Impressions; the Positive and Negative Syndrome Scale; the Social and Occupational Functioning Assessment Scale; and information about psychiatric hospitalizations, use of antipsychotic medication, and occupational status.

Results: Only 1 subject (1.7%) with DSM-III-R schizophrenia and 3 subjects (25%) with schizophrenia spectrum disorders fully recovered; 1 schizophrenia subject (1.7%) and 2 schizophrenia spectrum subjects (16.7%) experienced partial recovery.

Conclusion: The data indicate that, at least until age 35, complete recovery from schizophrenia is rare, and the prognosis for the disorder is far more serious than suggested by some follow-up studies.

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Schizophrenia is a severe mental disorder that often has an unfavorable outcome. When someone first becomes ill, it is a clinical challenge to estimate chances for a recovery and to say how likely it is that someone will return to pre-illness levels of functioning.

Emil Kraepelin first noted the poor prognosis of schizophrenia in 1898. According to Kraepelin,[1] only 2.6% of patients had a full and permanent recovery, and 13% recovered for a limited period. Eugen Bleuler[2] broadened the diagnostic definition of schizophrenia and included less severe clinical conditions. Although he thought that schizophrenia did not necessarily have a deteriorating course, he wrote that few patients ever fully recovered.

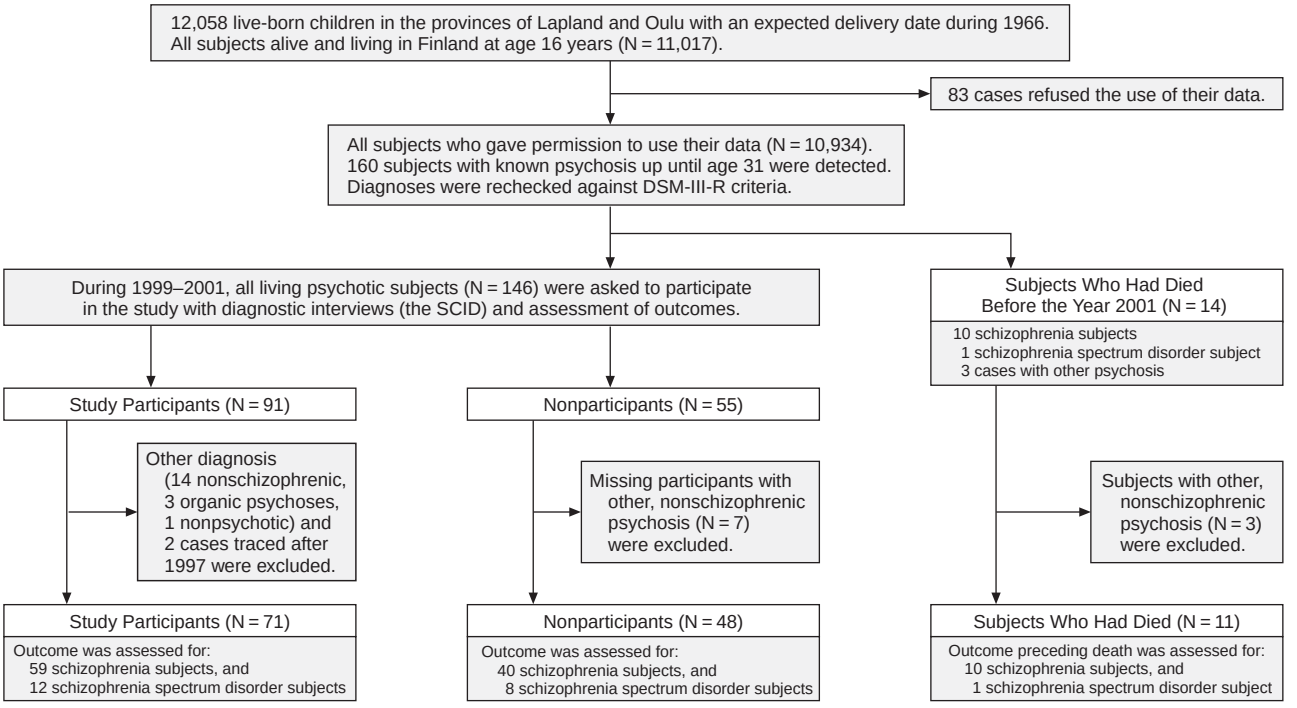
During the decades after Kraepelin and Bleuler, reports describing prognosis for schizophrenia became more favorable. Studies showed recovery or remission rates between 16% and 40%.[3–10] Other studies showed low rates of recovery or remission (recovery between 0%–10%).[8,11–14] However, a number of follow-up studies showed a marked variation of outcomes.[15–19] There is also a suggestion that after the 1970s, the prognosis of schizophrenia became worse.[20]

There are few studies that deal with recovery in schizophrenia spectrum disorders. These studies[10,21] report recovery rates of approximately 40%, depending on the diagnostic boundaries and outcome criteria. However, Tsuang and Coryell[13] report in their study that none of the patients with schizophrenia spectrum disorders recovered.

The absence of a general definition of recovery, variable diagnostic and outcome criteria, and cases lost to follow-up cause challenges in studying the course and outcome in schizophrenic psychoses. As indicated by McGlashan,[16] unique clinical characteristics of samples from particular clinics or hospitals, particularly the degree of established chronicity, may account for wide differences in observed recovery rates. The true rate of recovery in schizophrenia, however, can be established only by follow-up of an epidemiologically defined cohort.

In this study, we explored subjects with DSM-III-R schizophrenia and schizophrenia spectrum disorders from the population-based Northern Finland 1966 Birth Co-

Figure 1. Recovery From Schizophrenic Psychoses in the Northern Finland 1966 Birth Cohort: Data Collection Until the End of 2003



Abbreviations: DSM-III-R = Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised, SCID = Structured Clinical Interview for DSM-III-R.

hort. Our aim was to discover if any of these subjects had fully or partially recovered by age 35.

METHOD

Data Collection

The Northern Finland 1966 Birth Cohort is an unselected, general population birth cohort based upon 12,068 pregnant women and their 12,058 live-born children with an expected delivery date during 1966 in the provinces of Lapland and Oulu.[22–24] Permission to gather data (e.g., hospital records) was obtained from the Ministry of Social and Health Affairs, and the study design is under review of the Ethics Committee of the Faculty of Medicine of the University of Oulu. The subjects of the cohort can deny the use of their data at any time, and up to now 83 persons have done so. Data collection and methods are presented in Figure 1.

Subjects of the study. The nationwide Finnish Hospital Discharge Register (FHDR) covers all mental and general hospitals, as well as beds in local health centers and private hospitals nationwide. In Finland, until recent years, most patients who experience an episode of schizophrenic psychosis are hospitalized[23] and will appear in the FHDR. All cohort members aged over 16 years appearing in the FHDR until the end of 1997 for any mental disorder were identified. All case records were scrutinized and diagnoses were assessed for DSM-III-R criteria, after which the diagnoses were rereviewed by a professional panel. The reliability for schizophrenia diagnoses of this procedure was calculated ($\kappa = 0.85$). A more detailed description of the validation process of the cohort is presented elsewhere.[23,24] Information about deaths and the causes of death before the year 2001 was ascertained from the death certificates from Statistics Finland.

Altogether, 160 subjects with known psychotic episodes in their life up until the age of 31 years were detected. Three schizophrenia cases were treated solely as outpatients, and for them information was received from outpatient records. Of these 160 cases, 14 (8.8%) had died by the year 2001.

During follow-up in 1999–2001, all 146 living subjects (83 males, 57%) with a known psychotic episode were recruited. Ninety-one subjects (62%) agreed to participate in the field study and gave written informed consent. In this study, we included only subjects with schizophrenic psychoses detected by the year 1997; subjects having nonschizophrenic psychoses (N = 14), organic psychoses (N = 3), or nonpsychotic disorder (N = 1) were excluded. In addition, 1 schizophrenia case detected from the hospital ward after 1997 and 1 schizophrenia case treated solely as an outpatient and detected after 1997 were ex-

cluded. Subjects were divided into 2 DSM-III-R diagnostic groups: (1) schizophrenia (295, except 295.4 and 295.7) and (2) schizophrenia spectrum disorders, which included schizophreniform psychosis (295.4), schizoaffective disorder (295.7), and delusional disorder (297.1).

Assessment of Outcome

We collected information to assess the outcome of subjects with schizophrenic psychosis in 3 groups (Figure 1): (1) For subjects agreeing to be interviewed (participants) in the 1999–2001 study, personal interviews, hospital discharge registers, hospital records, and other anamnestic information were used. (2) For nonparticipants of the field study, hospital discharge registers, hospital and health center records, personal questionnaires, and telephone interviews were used during 2002–2003. (3) For deceased subjects, information about the causes of death and medical records from latest treating psychiatric hospitals and health centers were used.

Participants of the field study during 1999–2001. The diagnoses for all participating subjects were rechecked. For assessing diagnoses, Structured Clinical Interview for DSM-III-R, the SCID,[25] was the main diagnostic instrument together with all available anamnestic information, including hospital case notes. Altogether 59 subjects (34 men, 58%) with schizophrenia and 12 subjects (4 men, 33%) with schizophrenia spectrum disorders were detected (Figure 1).

Assessment of outcome of participating subjects was based on the following measurements:

1. The Severity of Illness subscale of the Clinical Global Impressions (CGI)[26] was used when rating the severity of illness. It has 7 different rating groups and its scores range from 1 (not ill at all) and 2 (no disturbances or minor symptoms) to 7 (among the most extremely ill).[26]
2. Positive and Negative Syndrome Scale (PANSS) was used to measure the amount of psychopathologic symptoms during the previous week.[27]
3. Social and Occupational Functioning Assessment Scale (SOFAS),[28] derived from the Global Assessment Scale (GAS), was used to rate social and occupational functioning of the patients during the previous week.

Subjects were also asked about their (4) psychiatric hospitalizations, (5) medication (drug and used dose) for the most recent 3 months, and (6) occupational status (full-time employee, part-time employee, unemployed, pensioned, on sick leave, student).

We used the following criteria for full recovery:

1. 1 or 2 points on CGI (1 = not ill at all, 2 = no disturbances or minor symptoms);
2. at least 71 points on SOFAS (not more than minor, temporary problems in social and occupational functioning);
3. at most 36 points total score on PANSS and, in addition, at most 2 points (minor symptoms) in each item of the positive or negative scale of PANSS;
4. no psychiatric hospitalizations during the last 2 years;
5. no or low-dose (300 mg or less as chlorpromazine equivalents[29]) antipsychotic medication at the study moment;
6. ability to work (not on disability pension and not on sick leave).

For partial recovery, subjects had to meet the criteria for CGI, have at most a total score of 36 on PANSS, have no hospitalizations during the last 2 years, and score at least 61 on SOFAS (not more than some problems in social and occupational functioning). Criteria used and outcome variables for each subject are shown in Table 1.

Nonparticipants of the field study. Fifty-five subjects (38% of all 146 living cases; 31 males, 56%) with earlier known psychosis could not be reached or refused to participate in the field study (Figure 1). Given that the extent of nonparticipation was fairly high in our study, we considered it to be important to track the maximum number of noninterviewed cases and assess outcomes for them. During 2002–2003, information for these persons was gathered from FHDR and medical records from health centers and hospitals. If there was not enough information at the hospital discharge register or medical records, a personal questionnaire was sent or the subject was contacted by telephone. Of the nonparticipants, 40 had a diagnosis of schizophrenia (27 men, 68%) and 8 cases (3 men, 38%), schizophrenia spectrum disorders. Case notes were rechecked against DSM-III-R criteria.[23,24]

Ascertaining the outcome for the nonparticipants was based on information about psychiatric hospital treatment during the last 2 years, current medication, and occupational status. It was not possible to get information about CGI, SOFAS, and PANSS, and we could not assess the full or partial recovery for the nonparticipants. In summary, we tried to identify subjects having poor outcome and nonrecovery and to cut down the number of lost cases and missing information.

When we compared participating cases with schizophrenic psychosis (N = 71) and nonparticipants with schizophrenic psychoses (N = 48), there were no significant differences in gender, parental socioeconomic status in 1966 or in 1980, educational level, age at the onset of illness, or number of psychiatric hospital admissions. Nonparticipants had spent, however, longer total time in a psychiatric hospital (nonparticipants: mean = 487 treatment days vs. participants: mean = 409 treatment days, Mann-Whitney test: U = 1315.5; p = .035).

Table 1. Criteria and Results Concerning Each Recovery Dimension in the Northern Finland 1966 Birth Cohort Study

	Schizophrenia (N=59)		Schizophrenia Spectrum[a] (N=12)	
Assessment of Outcome	N	%	N	%
Clinical Global Impressions				
1 or 2 points (fully and partially recovered)	2	3.4	5	41.7
Positive and Negative Syndrome Scale				
Total scores ≤ 36 and ≤ 2 in all positive and negative items (fully recovered)	7	11.9	5	41.7
Total scores ≤ 36 (partially recovered)[b]	3	5.1	3	25.0
Social and Occupational Functioning Assessment Scale				
≥ 71 points (fully recovered)	2	3.4	5	41.7
≥ 61 points (partially recovered)[b]	8	13.6	3	25.0
Hospitalization				
No psychiatric hospitalizations during last 2 years (fully and partially recovered)	42	71.2	9	75.0
Medication[c]				
No or low dose (fully recovered, not a criterion for partial recovery)	38	64.4	11	91.7
Working capacity				
Not on disability pension or sick leave (full recovery, not a criterion for partial recovery)	31	52.5	12	100
Recovery rates				
Full recovery	1	1.7	3	25.0
Partial recovery	1	1.7	2	16.7
Total	2	3.4	5	41.7

[a]Schizophreniform psychosis (N = 3), schizoaffective disorder (N = 7), and delusional disorder (N = 2).
[b]Including only cases meeting the criteria for partial recovery, not full recovery.
[c]Medication: transformed as chlorpromazine equivalents per day; low dose = 300 mg chlorpromazine equivalents per day or less.

Deaths. Until 2001, 10 subjects (9 men) with schizophrenia and 1 subject (female) with schizophrenia spectrum disorder had died. Causes of death for schizophrenia cases were suicide (7 subjects), accident or trauma (2 subjects), and unknown (1 case). The cause of death for the subject with schizophreniform psychosis was suicide. Suicides as a cause of death were seen as a sign of poor outcome. However, we wanted to assess outcome preceding death for those subjects who had died by accident or trauma or who had an unknown cause of death (Figure 1). We assessed outcome during the last 2 years of life based on information about psychiatric hospitalizations, antipsychotic medication, and occupational status derived from FHDR and medical records from the latest treating hospital or health center.

RESULTS

Participants of the Field Study During 1999–2001

One subject (1.7%) of a total of 59 subjects with schizophrenia and 3 (25%) of 12 schizophrenia spectrum disorder subjects met all our criteria for full recovery. Thus, in total, full recovery occurred in 6% (4/71) of subjects with earlier schizophrenia or schizophrenia spectrum disorders. In addition, 1 schizophrenia subject (1.7%) and 2 schizophrenia spectrum subjects (16.7%) had partial recovery, but did not fulfill the criteria for full recovery. Recovered schizophrenia subjects have been described in detail (fully recovered: case 3; partially recovered: case 5[30]). The subject with full recovery performed very well at school, studies, and professional life and was married. His acute psychosis just fulfilled the 6-month duration criterion of DSM-III-R schizophrenia. The subject who had partially recovered had bizarre behavior even before the school age, had difficulties in studies and working, and was living alone. Though his course was predicted to be chronic by the end of 1994, until the end of 2001, he shows only minor signs of illness. Altogether, 3.4% (2/59) of schizophrenia and 41.7% (5/12) of schizophrenia spectrum disorder subjects had fully or partially recovered. Results and distribution of subjects within different outcome variables are shown in detail in Table 1.

Characteristics of the whole sample and current outcomes for recovered subjects are presented in Table 2. There are missing data concerning PANSS, SOFAS, occupational status, antipsychotic medication, and familial risk for a few participating subjects, but the rate of missing data in any of the variables did not exceed 7% for all participants.

Nonparticipants of the Field Study and Individuals Who Died; Exclusion of Recovery

During the second phase of data collection in 2002–2003, we received information for 39 nonparticipants with schizophrenic psychosis. For 11 subjects (28%) (all having schizophrenia), the information was adequate to exclude both full and partial recovery, and altogether for 29 (74%), we could exclude at least full recovery (26 of these were subjects with schizophrenia). Eleven (28%) had received psychiatric hospital treatment during the last 2 years, 14 (36%) used high-dose (over 300 mg chlorpromazine equivalent per day) antipsychotic medication, and 23 (59%) were pensioned.

Six (15%) of the nonparticipants had not been hospitalized during the past 2 years, used no or low-dose antipsy-

Table 2. Current Outcomes (by the end of 2001) of Fully and Partially Recovered DSM-III-R Schizophrenia and Schizophrenia Spectrum Disorder Subjects, as Well as Some Characteristics of All Participants and Nonparticipants in the Northern Finland 1966 Birth Cohort Study

Cases	Clinical Outcome DSM-III-R Diagnosis	Age at Onset of Illness (y)	Sex	Family History of Psychosis	CGI	PANSS	Current Medication	Psychiatric Hospitalization During Past 2 Years	Social Outcome	
									SOFAS	Ability to Work
Full recovery[a]										
Schizophrenia case 1	295.30	27	Male	No	1	30	No	No	90	Employed
Spectrum case 1	295.40	20	Female	No	1	30	No	No	81	Unemployed
Spectrum case 2	295.40	19	Male	No	1	30	No	No	90	Employed
Spectrum case 3	295.40	26	Male	No	1	30	No	No	80	Student
Partial recovery[a]										
Schizophrenia case 1	295.30	25	Male	No	1	30	No	No	61	Employed
Spectrum case 1	297.10	31	Female	No	1	30	Low-dose	No	81	Unemployed
Spectrum case 2	297.10	28	Female	No	2	34	No	No	75	Maternity leave
All cases in the study	295.1 (N = 12)	23.5 (mean)	Male (N = 38)	No (N = 56)	4.6 (mean)	52.2 (mean)	No (N = 25)	No (N = 51)	50.4 (mean)	Employed (N = 14)
(N = 71)	295.3 (N = 16)		Female (N = 33)	Yes (N = 15)		*(2 missing data)*	Low-dose (N = 24)	Yes (N = 20)	*(3 missing data)*	Unemployed (N = 11)
	295.6 (N = 1)						High-dose (N = 21)			Pensioned (N = 28)
	295.9 (N = 30)						*(1 missing data)*			Student (N = 6)
	295.4 (N = 3)									Other (N = 12)
	295.70 (N = 7)									
	297.10 (N = 2)									
Nonparticipants[b]	295.1 (N = 6)	22.4 (mean)	Male (N = 30)				No (N = 8)	No (N = 27)		Employed (N = 6)
(N = 48)	295.3 (N = 12)		Female (N = 18)				Low-dose (N = 4)	Yes (N = 11)		Unemployed (N = 5)
	295.9 (N = 22)						High-dose (N = 14)	*(10 missing data)*		Pensioned (N = 23)
	295.4 (N = 4)						*(22 missing data)*			Student (N = 0)
	295.71 (N = 4)									Other (N = 1)
										(13 missing data)

[a]Criteria used for full and partial recovery: see Method and Table 1.
[b]For nonparticipants, there was no information concerning family history, CGI, PANSS, and SOFAS.
Abbreviations: CGI = Clinical Global Impressions, PANSS = Positive and Negative Syndrome Scale, SOFAS = Social and Occupational Functioning Assessment Scale.

chotic medication, and were not pensioned, and thus could possibly be fully recovered. One subject with schizophrenia died by natural death during our tracking of nonparticipants. For this subject, there were no medical records available, and we could not assess his outcome before death.

Among 3 subjects who had died by accident, trauma, or by unknown cause of death, recovery was excluded. Each of these subjects had been hospitalized during the past 2 years before death. For subjects who had died by suicide, the cause of death could be considered as a sign of poor outcome and nonrecovery.

Unfortunately, for the 39 nonparticipants, we could not obtain full information (hospitalizations, medication, occupational status), so that percentages may be suggestive.

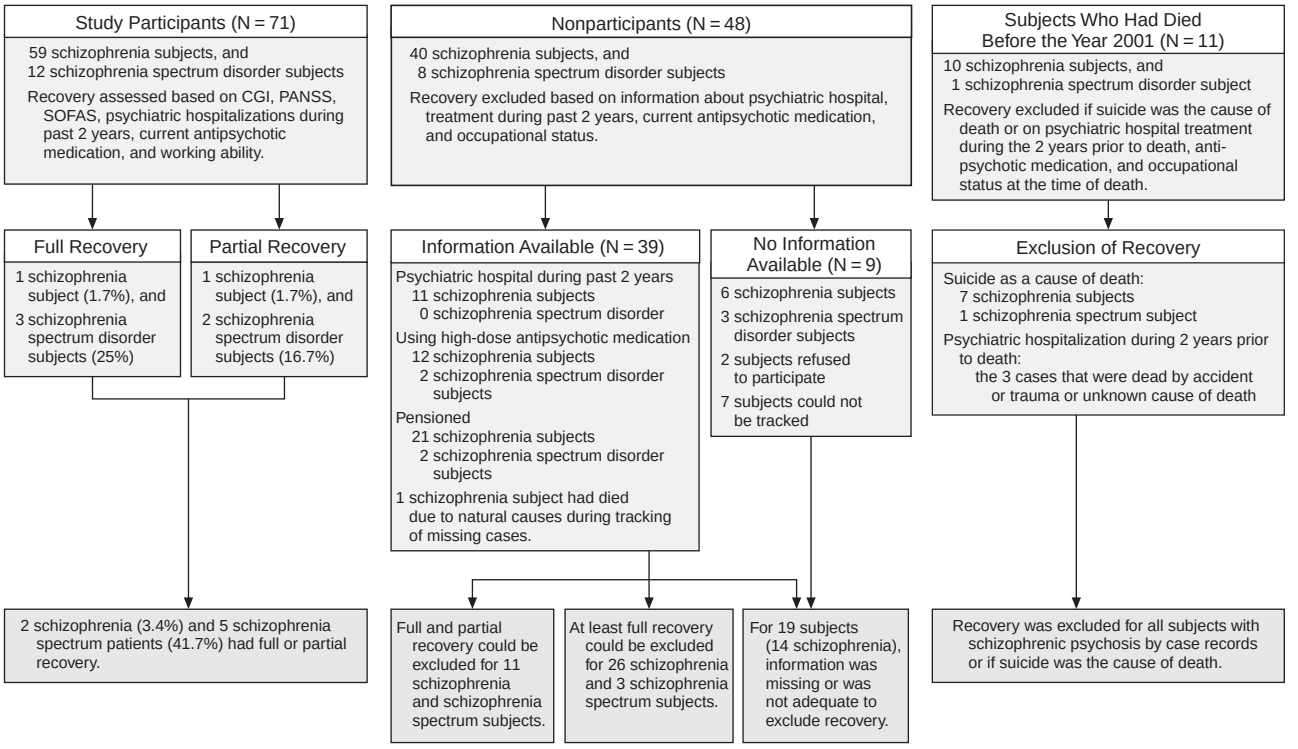
Finally, we did not obtain any information for 9 subjects with schizophrenic psychosis (6% of all 146 living cases). Seven of these did not reply to the questionnaire and could not be reached by telephone. Two refused to participate. When we compared treatment and sociodemographic variables across subjects for whom there was not adequate or no information (N = 19) and participants and nonparticipants with adequate information (N = 100), there were no statistically significant differences in sex, parental socioeconomic status in 1966 or 1980, educational level, age at the onset of illness, or number of psychiatric hospital admissions.

Figure 2 shows a summary of results for participants and nonparticipants and those subjects who had died.

Outcomes With Wider Criteria; Good Outcome

The criteria we used in this study for complete recovery were very strict. The CGI played an important role as a limiting criterion for recovery. If we widened our criteria to 3 (mild disorder) on the CGI and included other criteria, we found 2 additional fully or partially recovered schizophrenia cases, thus increasing the total recovery rate among schizophrenia subjects to 7% (4/59). If we broadened our criteria even more to mirror recovery criteria of some other outcome studies, the total recovery rate increased to 15% (9/59) in schizophrenia and 58% (7/12) in schizophrenia spectrum disorder patients. Here the criteria were no psychiatric hospitalizations during the last 2 years, no or low-dose antipsychotic

Figure 2. Recovery From Schizophrenic Psychoses in the Northern Finland 1966 Birth Cohort: Main Results of the Study



Abbreviations: CGI = Clinical Global Impressions, PANSS = Positive and Negative Syndrome Scale, SOFAS = Social and Occupational Functioning Assessment Scale.

medication at the study moment, and a SOFAS score of at least 61.

DISCUSSION

Main Findings

Our results suggest that very few subjects with schizophrenia (defined by DSM-III-R criteria) recover from the illness by early middle age. Only 3.4% of subjects with schizophrenia were fully or partially recovered. Among the subjects with schizophrenia spectrum disorders, recovery seems to be more likely, with 41.7% of subjects fully or partially recovered.

Methodological Discussion

Diagnostics. DSM-III-R criteria for schizophrenia may select schizophrenia patients who are destined to have a poor prognosis. According to the DSM-III-R manual,[31] full remission does occur, but it is not common. Limited diagnostic accuracy and varying diagnostic criteria may be one reason why the proportion of recovery varies from study to study.[32] Hegarty et al.[20] found that the outcome was poorer in studies using Kraepelinian diagnoses (DSM-III-R schizophrenia) compared to non-Kraepelinian systems (schizophrenia spectrum disorders). Modestin et al.[33] rediagnosed the original patient sample of Manfred Bleuler with several diagnostic systems. They found that when using a more narrow diagnosis (e.g., DSM-III-R) of schizophrenia, the recovery rate decreased to 12%, whereas diagnosed by Bleuler's criteria, the recovery appeared to be 22%.

In this study, the diagnosis of the participants was based on the SCID interview and extensive anamnestic data, including hospital case notes of all participants. With nonparticipants, good diagnostic accuracy was obtained.[23,24] However, our entry criteria were rather strict, based upon a narrow definition of schizophrenia and, in most cases, hospital admission and discharge at a relatively young age. Thus, our sample may be biased toward the most severely ill.

Definition of recovery. Questions have even been raised about whether recovery from schizophrenia is possible. Given that relapses occur, the length of follow-up becomes a key factor. It is difficult to determine whether the illness is in remission or if the patient has permanently recovered. In a follow-up study of Rund[34] and Torgalsboen and Rund,[35] half of recovered patients relapsed after 10 years. These results suggest that recovery from schizophrenia may take the form of time-limited remission. It is likely that our results may change in the

future; recovered patients may experience relapse or new recovered patients may emerge.

Recovery is a multidimensional concept, involving different areas of functioning, such as clinical symptoms, social functioning, working ability, and the patient's satisfaction with life. In the beginning of the recovery process, a patient's clinical outcome may start improving first, and recovery in social and functional abilities may come later.[36] When defining individual recovery, a person's premorbid level of functioning should be considered. What is the level of functioning that we require for recovery? Should a patient return to the pre-illness level or instead to the age-specific level of functioning in terms of education, occupation, and mature adult identity? All of these are usually developing rapidly between ages 20 and 30. For example, in Finland, nearly all adolescents attend secondary school. Most people—even those with adult psychosis—complete at least vocational training; approximately 62% to 70% of schizophrenia cases, compared to 62% of the general population without psychiatric hospitalizations, have attained upper secondary education or vocational training.[37] This is why we considered occupational status as a recovery criterion. However, the rate of unemployment in Finland is relatively high, and it is not unusual that "healthy" persons are without occupation and receive unemployment benefit from the state. This is why we did not consider unemployment as a sign of nonrecovery. It should be noted that, while we report that 53% of schizophrenia patients are not on disability pension or unemployment at follow-up, this is a crude measure of occupational functioning and we do not know the precise proportion of patients working full- or part-time.

The recovery criteria that we used assessed both the clinical condition (CGI, PANSS, hospitalizations, antipsychotic medication) and social abilities (SOFAS, working ability) of study subjects. In addition, healthy external appearance of subjects was required (assessed using CGI and PANSS). Because of various criteria and the use of CGI—which all were rated by experienced clinicians—recovery in this study was defined by widely eliminating the functionally and clinically relevant signs of the illness.

Nonparticipant potential source of bias. It is possible that missing cases may contain both extreme variations of outcome: recovered cases (e.g., wanting to seal over their psychotic experience) and cases having very poor outcome (e.g., very sick, paranoid persons avoiding all contacts). It is often assumed that patients with poor prognosis are more often lost to follow-up,[10,38] but there are studies showing no difference in variables with prognostic significance between examined and lost cases.[8,9] According to Fenton and McGlashan,[39] there are schizophrenia patients who do very well without any medication. Because these patients do not necessarily need any treatment, they may more often be lost to follow-up.

In this study, it was not possible to assess recovery among nonparticipants. Instead, we excluded subjects with indicators of nonrecovery. It is also possible that there were subjects who recovered among those about whom we did not receive any information (N = 9), or among those about whom we received information that was not adequate to exclude recovery (N = 10). However, because there were no differences in the commonly used sociodemographic or treatment variables that may predict outcome, we may assume that studied subjects and nonparticipants without enough information are similar to each other, and thus our results can be generalized to the whole Northern Finland 1966 Birth Cohort.

We analyzed missing data as extensively as Finnish legislation allows. Most of the final missing subjects (N = 9) denied the delivery of their addresses or phone numbers, which may have been due to paranoid thoughts. However, the outcome among these subjects is probably heterogeneous.

Comparison With Other Studies

The extent of recovery in schizophrenia is controversial, and different follow-up studies have yielded widely different estimates of the probability of recovery. The results of our study are slightly more pessimistic when compared to other follow-up studies. This is probably due to our strict criteria when defining recovery. Many other studies have used fewer or more lenient criteria when defining recovery (e.g., lack of psychotic symptoms, no further hospitalizations after first admission, ability to work). Studies using moderately strict criteria for recovery show rates of 6% to 17% as fully recovered.[4,8–10,12]

Our results are similar to those of McGlashan,[12] Tsuang and Coryell,[13] and Opjordsmoen.[21] These studies used similar diagnostic criteria as our study. These studies measured mainly clinical recovery, however, and the results might have been worse if they had included personal and social aspects. When we loosened our criteria for recovery, the number of recovered cases increased among schizophrenia to 15%, which is close to many other studies with rather similar recovery criteria.[4,9,10]

Our results for recovery in schizophrenia spectrum disorders are similar to earlier findings.[10,13,21] In our study, over 40% of cases experienced recovery, which is very close to the study of Opjordsmoen[21] in which 37% of delusional disorder patients had complete recovery. In contrast, Tsuang and Coryell[13] found no recovered schizoaffective subjects.

The age at onset of illness among our sample varies (from 16 to 31 years, mean = 23.5 years), and thus the follow-up period for each case differs (from 3 to 18 years, mean = 10.2 years). Different length of follow-up in different studies may vary from a few years to over 3 decades and may also influence reported recovery rates. Although decreased functioning in certain dimension of

outcome is found to be stable,[39] the outcome of patients may change and become more favorable[10] over time, and, even after years of illness, recovery or remission is possible.[7]

The population of our study is different than in many earlier follow-up studies. For many of our subjects, the age at the illness onset was still rather low, which is related to difficult clinical symptomatology and poor prognosis[10] and may to some extent explain our results. Follow-up has been very short for subjects who became ill recently, and only cases having early onset have had follow-up long enough to assess full or partial recovery in the long term. Earlier studies were usually based on unselected, first admission patient cohorts in hospitals, admitted in certain time periods. These patients are not fully representative of those in the general population. Presently, there are few outcome studies of unselected epidemiological samples.[10,14]

Variations between treatment systems in different countries should be considered. In Finland, it has been very common that a patient suffering a first episode of schizophrenic psychosis is hospitalized.[24] Thus, it can be assumed that an outcome study based on a Finnish Hospital Discharge Register includes schizophrenia patients with various prognoses. This study included only 3 schizophrenia patients who were treated solely as outpatients.

In Finland, there are few earlier studies about outcome in schizophrenia. In Achte's study[11] of 2 different samples of typical schizophrenia cases, complete recovery occurred in 2% and, after 5-year follow-up, in 8%. In schizophreniform psychoses, the recovery rates were 62% and 83%. Recovery was defined as absence of psychotic symptoms, ability to work at the same level as before getting ill, and being employed. Apparently, structured diagnostic criteria were not used in this study, but the criteria for recovery and the results concerning schizophrenia are quite similar to ours; in schizophrenia spectrum, our recovery rate is somewhat smaller. According to Salokangas,[5] with wider criteria of recovery, approximately 19% of schizophrenia and 29% of schizophreniform patients were without psychotic symptoms after a 7.5-year follow-up. When comparing these results to ours, we had poorer results in schizophrenia. However, the criteria for recovery were rather different.

Strengths and Limitations of Our Study

The sample of this study is population based, which is important to estimate the true prognosis and outcome in schizophrenic psychosis. Our diagnostics should be accurate; the diagnoses for the entire sample were rechecked twice by professionals.[23,24] Due to tracking of nonparticipants, the number of missing subjects with schizophrenic psychosis was finally rather low.

Our study has some limitations. The reliability of measures other than diagnosis was not formally assessed. Subjects in the cohort are young (35 years), and length of follow-up differs among subjects, which may affect the comparability of our results to those presented earlier. Some subjects have been ill for a short time (minimum 3 years) and have a potentially better prognosis than cases with an earlier onset. At that point, it was not possible to determine if they were recovered. Population-based samples have an advantage, but compared to nonepidemiologic studies, sample size tends to be quite small, as it was in this study. For the nonparticipants, we knew the psychiatric diagnosis only by hospital discharge registers and medical records, and we did not receive all the desired information for all cases. We could not assess recovery for nonparticipants and for subjects who had died, although it was possible to exclude recovery for most cases. We used a rather strict definition of full and partial recovery, which is an advantage because we wanted to study explicit global recovery, or even "normal health" and "cure."

CONCLUSIONS

When considering only recovery, our results are somewhat closer to those reported by Kraepelin[1] than to results from more recent studies. According to our study, recovery from DSM-III-R schizophrenia in an epidemiologic sample is uncommon, at least until early middle age. In milder schizophrenic psychosis, recovery is more likely, as has been presented in earlier studies. The data indicate that at least until age 35, DSM-III-R schizophrenia has a far more serious prognosis than suggested by some follow-up studies.

The results of our study have significance when planning health care systems. If recovery from schizophrenia is unlikely, then how will this impact health care? Is the treatment for schizophrenia patients optimal and effective? Could and should we do something differently? Has the prognosis worsened during the last decades?

The results of this study also have importance when informing patients and relatives about the prognosis of schizophrenic psychosis. Of course, consideration should be used when reporting results like these. It should be noted that criteria in this study were strict, focusing on full and complete recovery. In addition, our results do not exclude the possibility of a substantially good outcome in schizophrenia and related disorders, particularly over longer follow-up periods.

Drug name: chlorpromazine (Thorazine, Sonazine, and others).

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