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Course of patients diagnosed as having schizophrenia during first episode occurring under age 18 years

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Abstract Of 118 child and adolescent schizophrenic patients (ICD-9: 295.x; mean onset age 16.0 years), 97 (82.2%) could be completely investigated at follow-up (mean interval 7.4 years; mean age 23.1 years). At follow-up 30% of the patients were semidependent or dependent, 72% still required psychiatric treatment, 44% were at least moderately impaired with regard to educational/occupational functions and 58% with regard to social functions; 73% had experienced at least one further schizophrenic episode. Comparison with schizophrenia beginning in adulthood showed that the impairment in social function was much greater in the younger group of patients. These results support the belief that schizophrenic psychoses starting in adolescence have a worse outcome than those beginning in adulthood. The most efficient indicators for a worse outcome were long duration of inpatient treatment at first admission, a high number of symptoms and low social competence at discharge.

Introduction

Various studies on large populations of adult schizophrenic patients have shown that disability following the disorder may be severe and persistent, even when patients manage to remain out of the hospital (Owens and Johnstone 1980; Johnstone et al. 1984, 1986; Macmillan et al. 1986; Leary et al. 1991). Follow-up studies conducted in German-speaking countries found one third with a good outcome, one third with a moderate outcome and one third with a poor outcome (Bleuler 1972; Ciompi and Müller 1976; Huber et al. 1979). Watt et al. (1983) and Biehl et al. (1987) conducted 5-year prospective follow-up studies of adult schizophrenic patients and found roughly similar results: After 5 years there were 23% or 19% with only one episode/no disability, 35% or 37% with more than one episode and no or minimal disability, and 42% or 44% with more than one episode and constant or increasing disability.

However, analyzing studies on smaller samples (by Annesley 1961, Carter 1942, Errera 1957, Masterson 1956 and Warren 1965) Weiner (1982) concluded that the outcome of schizophrenia beginning in adolescence is less favourable than of that starting in adulthood. Only about 25% of the adolescent patients reached full recovery, 25% improved but suffered continuing symptoms or occasional relapses and the remaining 50% made little or no progress and required continuing residential care. In comparison, although schizophrenic adults were not more likely to recover, more of them (about 50%) achieved periods of improvement and fewer (25%) remained permanently hospitalized or socially incapacitated (Bleuler 1978; Stephens 1970; Vaillant 1978).

In a more recent study Werry et al. (1991) followed up 30 schizophrenic children and adolescents (mean onset age 13.9 years; mean follow-up time 5 years). Only 17% of their patients were found to be well at follow-up. The authors concluded, as had already been stated by Westermeyer and Harrow (1988) about schizophrenia in adults, that "the picture of child and adolescent schizophrenia here is disturbing. It is that of a chronic or relapsing disorder accompanied by considerable disability and significant deterioration in adaptive function from often already impaired premorbid levels – all more like Kraepelin's dementia praecox than some modern, more benevolent views of schizophrenia" (Werry et al. 1991, p. 464).

Because of the small number of studies on schizophrenia in adolescence and small sample sizes, very important questions remain about the long-term outcome of the disorder and its predictive factors. The present study reports on first admission and follow-up data, and indicators of outcome, in a sample of 118 patients with schizophrenia beginning before age 18 years.

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Subjects and methods

Original sample

These were all patients consecutively admitted to the Child and Adolescent Psychiatric Inpatient Clinic at the Central Institute of Mental Health, Mannheim, Germany, between July 1976 and June 1990 who were younger than 18 years, treated as inpatients for more than 1 day and who had any ICD-9 classification (World Health Organization 1978) of 295 whatever subgroup. Patients diagnosed as schizoaffective (n = 13) were included, because a comparison with schizophrenic patients did not reveal substantial differences in any of the variables investigated. The few patients treated in the outpatient unit were all ultimately admitted to the inpatient unit within a short time. Seven adolescents treated as inpatients for other psychotic disorders (ICD-9: 296 [n = 5], 297 [n = 1] and 298 [n = 1]) were excluded even when diagnosed as schizophrenic (ICD-9: 295) in a second or further episode, because in our approach – in contrast to using life-time diagnoses and analyzing *antecedents* of disorder/disability in adulthood, as done by Werry et al. (1991) – a first-episode diagnosis of schizophrenia and associated data were the criteria for studying later *outcome*.

A total of 33 patients came from Mannheim itself, a mid-sized industrial town of 300,000 inhabitants in southern Germany, and 85 patients from the surrounding area. Because the Child and Adolescent Psychiatric Clinic at the Central Institute of Mental Health is the only child and adolescent psychiatric inpatient unit in the city, and because a schizophrenic disorder, at least in its active phase, mostly requires inpatient treatment, it is likely that the sample included nearly all schizophrenic children and adolescents from Mannheim during the 14-year period. A check for patients treated in the adult unit of our center and in surrounding clinics supported the belief that all adolescent patients from Mannheim were included.

Because of the unknown representativeness of the 85 patients from the surrounding area of Mannheim, a comparison between the two samples (n = 33; n = 85) was made. There were no significant differences in positive, negative or total symptoms (for definition see *Symptomatology*), social competence, daily doses of neuroleptics (both at admission and discharge) and duration of first inpatient stay. Only age at first hospital admission was slightly higher in the Mannheim sample than in the other (16.4 years vs 15.9 years; t = 1.98; P = 0.05), and there was a slight preponderance of girls in the Mannheim sample (Mannheim sample: 13 boys, 20 girls; sample of the surrounding area: 51 boys, 34 girls; P = 0.04). Because outcome measures (described in *Follow-up*) also showed no significant differences between the two samples, the two samples were pooled for further analyses.

Follow-up sample

Of the original sample (n = 118), 97 (82.2%) could be completely investigated at follow-up. Of the 21 dropouts, 6 could not be traced, 4 had died (2 suicides and 2 probable suicides), 3 had left Germany and 8 refused to participate. The mean age at first hospital admission of patients seen at follow-up was 16.6 years, that of the dropouts 15.9 years (Mann-Whitney U-test; P = 0.02) and duration of the first inpatient episode 5.7 months (follow-up patients) vs 3.5 months (dropouts; Mann-Whitney U-test; P = 0.02).
However, there were no significant differences between the two groups with regard to positive symptoms, negative symptoms, total symptoms, social competence, daily dose of neuroleptics, (both at admission and discharge), total dose of neuroleptics during first episode and duration of interval between first and second episode. Thus, the patients investigated at follow-up and the dropouts were comparable with regard to the most meaningful variables, except age at and duration of first admission. Both of these may reflect severity of illness, but this was not reflected in the symptom and social competence scores.

First episode

Data capture

Data that contained a lot of descriptive information, including detailed daily statements written by the nursing staff, were extracted retrospectively from patients's records from the years 1976 (July) to 1990 (June). Although a uniform documentation system could be referred to (which documents as a matter of routine basic patient-related data including detailed psychopathological information), certain minor inaccuracies of coding were inevitable. Therefore, a retest was carried out by a second independent rater who found only small discrepancies on the scales.

Diagnoses

All diagnoses in the record were the result of consensus among all child and adolescent psychiatrists and psychologists in a diagnostic conference at discharge. With the careful examinations carried out during the inpatient stay, this would be expected to result in a high reliability of the diagnoses.

Episode

Except for two cases (1.7%; treated for their first episode in another clinic, therefore their first episode data apart from the diagnoses were not available), all patients were admitted to our clinic during their first episode. In these two cases the second episode was taken as the index episode; however, the diagnoses during the first episode had been schizophrenia in both cases.

Symptomatology

Six positive (delusions, hallucinations, thought insertion/withdrawal, formal thought disorder, psychomotor disturbances and aggression), four negative (shallow/inappropriate mood, lack of drive, social withdrawal and attention deficit), and five symptoms not classified as positive or negative (altered state of consciousness, disorientation, compulsions/phobias, excitement and overactivity) were rated on a four-point scale (0 = not present; 1 = equivocal; 2 = moderate; 3 = severe). Note that the database did not allow a coding of the symptomatology following the SANS (Andreasen and Olsen 1982); however, it was attempted to rate symptoms according to their guidelines as far as possible.

It has to be considered that only well-documented symptoms and functions could be assessed retrospectively. Social competence (joins daily ward routines without help, contacts other patients, contacts staff members, manages activities of daily living, concentrates continuously, self-initiated activities, can cope with emotional stress, masters tasks independently, manages physical stress, masters group situations) was rated on a five-point scale (0 = social competence completely absent; 1 = insufficient social competence; 2 = equivocal social competence; 3 = moderate social competence; 4 = good social competence). All these ratings were carried out at the beginning and end of the inpatient treatment episode by medical students specially trained in these techniques. These ratings were summed up to the score of positive symptoms (range 0–18), negative symptoms (range 0–12), total symptoms (range 0–45) and social competence (range 0–40).

Follow-up

Interview

The main instrument used was a highly-structured interview (MIS-ABE; Blanz et al. 1989). The interview assessed in detail both the premorbid and the present educational and occupational level by operationalized criteria (see *Outcome measures*). Furthermore, the interview contained the German version of the Disability Assessment Schedule (DAS; WHO 1988; for details see Jung et al. 1989), an interview that assesses social disability using 14 dimensions. The interviews were conducted by the authors of this paper in the years 1990 and 1991. A total of 22 (23%) were conducted with the patients themselves (only in cases without any key person and when the patient's condition allowed to provide reliable information), 39 (40%) with one parent, 32 (33%) with the current therapist and 4 (4%) with spouse/life companion.

Outcome measures

Outcome measures consisted of a series of global and detailed measures of both present social disability and educational/occupational impairment. The global assessment of educational and occupational impairment was based on a comparison (difference) between premorbid and present educational/occupational (school, job training and occupation) level rated on an operationalized six-point scale (0 = no impairment; 1 = no impairment but delayed completion of more than 1 year; 2 = mild impairment was rated if there were only two decreased levels in one field; 3 = moderate impairment, meaning a decrease of either at least two levels in at least two fields or at least three levels in one field; 4 = severe impairment was rated if there was a decrease of at least two levels in all three fields or a decrease of more than three levels in one field; 5 = complete impairment, total loss of competence. For example, mild impairment was rated if educational achievement was lower than premorbidly intended and no other impairment existed; moderate, if a skilled job had been learned, but the adolescent now only worked in a sheltered work place; severe, if premorbidly an advanced school education had been aimed at but not completed, with the adolescent unable to learn a skilled job and now doing occupational work only under therapeutic supervision. Complete impairment was rated if somebody was not able to do anything workwise.

Social disability was assessed by the 14 dimensions (each on a five-point scale: 0 = no disability; 1 = mild disability; 2 = moderate disability; 3 = severe disability; 4 = complete disability) of the German version of the DAS (WHO 1988; Jung et al. 1989). Three dimensions (affective relationship to spouse, sexual relations and care for children) were excluded from the calculations because of low rates (see Fig. 1).

Prediction of outcome

In order to identify indicators for the long-term outcome of the disorder, correlations (Spearman-Correlation) were calculated between first episode and follow-up data.

Results

First episode

Table 1 contains data of the first episode. The youngest patient with a schizophrenic episode was 11 years old. The preponderance of males did not reach statistical significance. Regarding age at first admission, we did not find any difference between males (16.0 years; SD 1.28 years) and females (16.0 years; SD 1.38 years; for further details see Blanz et al. 1993). Of adolescents with schizophrenic psychoses 25 (21%) had had former episodes of psychiatric treatment (as out- or inpatients) for various diagnoses other than schizophrenia. The number of patients with psychiatric diagnoses left untreated is unknown.

Admission scores of positive, negative and total symptoms were significantly ($P < 0.001$) and substantially (at least one SD) reduced at discharge, whereas the score of social competence increased significantly ($P < 0.001$; Table 2).

Table 3 shows the correlations between the essential features of the disorder at admission and discharge. (Note

Table 1 Schizophrenic psychoses beginning in adolescence: premorbid and first-admission data ($n = 118$)

	N	%
Former ICD-9 diagnosis before index episode		
No known disorder	93	79
Schizophrenia (295.x)	2	2
Neurotic disorders (300.x)	6	5
Personality disorders (301.x)	2	2
Enuresis (307.6)	1	1
Conduct disorders (312.x)	2	2
Specific emotional disorders (313.x)	5	4
Unknown diagnosis	7	6
Sex		
Male/female (*n*)	64	54
	Mean	SD
Age at admission (years)	16.0	1.3
Duration of inpatient treatment (months)	5.3	4.3
Daily dose of neuroleptics[a]		
Admission	9.8	8.3
Discharge	5.3	8.2
Total dose of neuroleptic during first episode[a]	1131.3	990.2

[a] Neuroleptics in equivalents of haloperidol (1 mg haloperidol means 23.2 chlorpromazine equivalents according to Jahn and Mussgay 1989)

Table 2 Schizophrenic psychoses beginning in adolescence: symptoms and social competence at first admission and at discharge ($n = 118$)

	Range	Mean	SD
Positive symptoms	(0–18)		
Admission		7.3	4.3
Discharge***		1.7	2.5
Negative symptoms	(0–12)		
Admission		6.6	2.7
Discharge***		3.1	2.5
Total symptoms	(0–45)		
Admission		17.9	7.3
Discharge***		5.7	5.1
Social competence	(0–40)		
Admission		25.0	5.9
Discharge***		32.2	5.8

*** $P < 0.001$ (Wilcoxon test)

Table 3 Schizophrenic psychoses beginning in adolescence: correlations between essential features of the disorder at admission and discharge ($n = 118$)

Admission	Discharge			
	Positive symptoms	Negative symptoms	Total symptoms	Social competence
Positive symptoms	–	–	–	–
Negative symptoms	–	0.27**	–	– 0.21*
Total symptoms	–	0.15 *	0.16 *	– 0.27**
Social competence	–	–	–	0.34***

* $P < 0.05$
** $P < 0.01$
*** $P < 0.001$

that high scores in symptoms indicate impairment, whereas high scores in social competence indicate good functioning.) As expected, the score of negative symptoms at admission was significantly correlated with the score of negative symptoms at discharge, as were scores of total symptoms (admission/discharge) and social competence (admission/discharge). Total and negative symptoms scores at admission were significantly negatively correlated with social competence at discharge; total symptoms score at admission was correlated with negative symptoms at discharge. All other correlations failed to reach statistical significance. However, the explained variance is below 12%.

Follow-up

Stability of diagnoses

The mean number of all psychiatric episodes since index admission was 2.5 episodes (SD 3.0; range 0–17). Between first episode and follow-up 10 (8.5%) of the 118 patients were also treated for diagnoses other than schizophrenia: 2 patients for bipolar affective disorders (ICD-9: 296), 6 patients for personality disorders (ICD-9: 301), 1 patient for a transient organic psychotic condition (ICD-9: 293) and 1 patient for a disturbance of emotions specific to childhood and adolescence (ICD-9: 313).

Independence

The time interval between first episode and follow-up was 7.3 years (range 0.8–15.0 years; SD 4.4 years). The mean age of the probands at follow-up was 23.1 years (SD 4.3 years). Only a quarter ($n = 26$; 26.8%) of the sample had no further schizophrenic episodes. A high number (54.%; Table 4) of former patients were still living with their parents. More than a quarter of the sample was not able to live independently and needed institutional support (semidependent or dependent; Table 4). Less than a fifth of the sample was financially independent; the other four fifths were financially supported by their parents, spouses/life companions or public assistance. Three quarters still required psychiatric treatment at follow-up (Table 4). Comparing males and females, differences did not reach statistical significance.

Educational/occupational impairment and social disability

Although about a quarter (23; 24%) of the adolescents with schizophrenic psychoses beginning before age 18 years had no global educational/occupational impairment, 44% (43) of them had at least moderate impairment (Table 4). In detail, 49% did not achieve the school grades

Table 4 Schizophrenic psychoses beginning in adolescence: outcome adjustment and global assessment of educational/occupational impairment and of social disability at follow-up

	Males	Females	Total	
	($n = 53$)	($n = 44$)	($n = 97$)	%
Schizophrenic episodes since index				
None	14	12	26	26.8
1–2	16	16	32	33.0
2+	23	16	39	40.2
Living situation				
Alone	4	5	9	9.3
Spouse/life companion	2	5	7	7.2
With parents	29	23	52	53.6
Semidependent	4	4	8	8.2
Dependent	14	7	21	21.6
Means of maintenance				
Occupation	10	7	17	17.5
Parents, spouse	25	25	50	51.6
Public assistance	18	12	30	30.9
Psychiatric care				
No treatment	16	11	27	27.8
Outpatient treatment	30	26	56	57.8
Inpatient treatment	7	7	14	14.4
Educational/occupational impairment				
None	4	8	12	12.4
No impairment, but 1–2 years delay	7	4	11	11.3
Mild	16	15	31	32.0
Moderate	14	8	22	22.7
Severe	9	7	16	16.5
Complete	3	2	5	5.2
Social disability				
None	10	10	20	20.6
Mild	13	8	21	21.6
Moderate	12	13	25	25.8
Severe	17	12	29	29.9
Complete	1	1	2	2.1

aimed for, 58% began an occupational training below that corresponding to their school grades, 55% did not achieve the occupation they initially intended to, and 32% were employed at a lower level than before.

Social disability presented almost the same picture: About a fifth (20; 21%) had no social disability, about a fifth (21; 22%) were mildly disabled and more than half (56; 58%) were at least moderately socially disabled (Table 4). Regarding global assessment of educational/occupational impairment and social disability, at follow-up males and females did not differ significantly.

Comparison between schizophrenia beginning in adolescence and adulthood

Figure 1 shows a comparison of the single variables of the DAS between the group of patients with schizophrenic psychoses beginning in adolescence and a sample of patients with schizophrenic psychoses beginning in adulthood investigated seven times within 5 years after first admission (Jung et al. 1989). For this comparison the data of the 5-year interval follow-up of the adult patients were used; in both samples all ratings were divided into two groups: 0 = no or mild disability; 1 = moderate, severe or complete disability. The results show the generally greater social disability of the patients with schizophrenic disorders beginning in adolescence, especially for the variables self-care, underactivity, slowness, social contacts, participation in household duties and interest in current affairs, reaching statistical significance (*at least* $P < 0.05$; χ^2 tests). This result cannot be attributed to a high proportion of patients with severe impairments due to a recent psychotic episode, because there were only 13 patients with a follow-up time interval under 2 years (2.0–5.0 years: n = 28; 5.1–10.0 years: n = 23; > 10.0 years: n = 33).

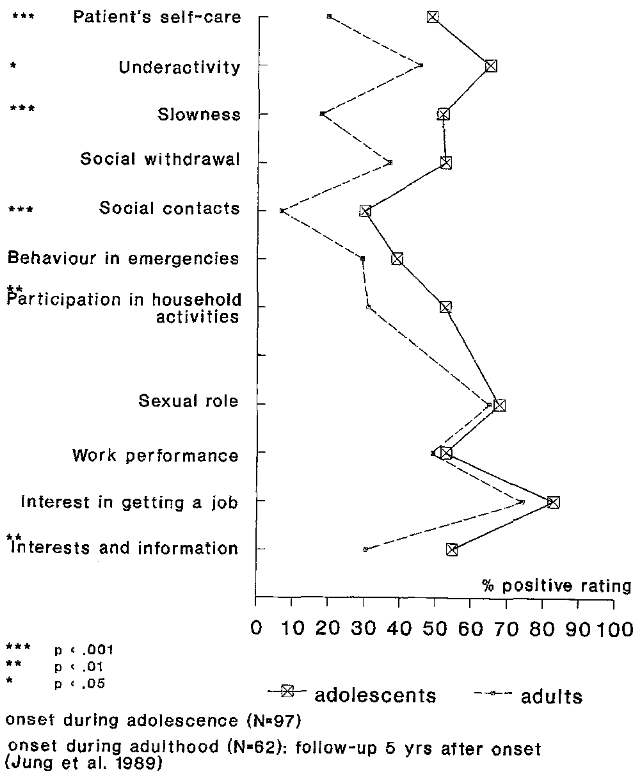

Fig. 1 Schizophrenic psychoses beginning in adolescence and adulthood: comparison of Disability Assessment Schedule (DAS)-scores

As the different follow-up time interval in the two samples (adolescents: 7.4 years; adults: 5.0 years) is a possible objection to this comparison in that the greater disability in the adolescent sample could be caused by their longer follow-up time interval, a further comparison was calculated with a follow-up time interval of no more than 5 years in the adolescent sample (n = 41; mean follow-up time 3.1 years; not shown in the figure). This comparison again demonstrated the generally greater social disability of the adolescents with schizophrenic psychoses compared with the adult sample. Self-care, slowness and social contact reached statistically significant differences.

Predictors of outcome

A further analysis was performed in order to identify predictors of outcome as measured by educational/occupational impairment and social disability. Included were symptomatology, social competence, daily dose of neuroleptics, all at admission and at discharge, age at first admission, duration of first episode, total dose of neuroleptics during first episode and number of episodes. The results are shown in Table 5: The prediction of the educational/occupational impairment was the same as the prediction of social disability. As expected, a longer duration of first episode, lower social competence and more symp-

Table 5 Schizophrenic psychoses beginning in adolescence: significant correlations between features of first admission and follow-up measurements (n = 97)

	Educational/ occupational impairment	Social disability
	r	r
Duration of first episode	0.36***	0.36***
Status at discharge:		
Social competence	−0.28**	− 0.32***
Positive symptoms	0.28**	0.35***
Negative symptoms	0.29**	0.32***
Total symptoms	0.31**	0.35***
Number of episodes	0.29**	0.21*

* $P < 0.05$
** $P < 0.01$
*** $P < 0.001$

NOTE: No significant correlation was found regarding symptomatology at admission (total, positive and negative symptoms, social competence); dosage of neuroleptics (at admission, discharge, total dose during first episode); age at first admission toms at discharge, as well as a higher number of episodes, were found to be associated with a poorer outcome. Age at first admission, symptomatology and social competence at admission and daily dose of neuroleptics at admission, as well as at discharge, were of no significant value for the outcome measurements.

Discussion

Some methodological shortcomings of the study require comment:

1. All initial data were retrospective and thus limited in accuracy and scope (although the study design was not strictly retrospective, because the data used had been gathered already at the time of hospitalization of the patients).
2. Measures and methods are evaluative in the areas of symptomatology or social competence.
3. The patients from Mannheim who were probably representative, and those from the surrounding area who were probably biased towards more severe schizophrenic disorders and more numerous, were pooled. This could lead to some over-representation of more severely affected cases. Although not dismissable, this is not likely, because the two groups of patients did not differ with regard to meaningful first admission and follow-up data, except in older age of onset, gender distribution and longer stay.
4. Although the dropout rate of 17.8% was only moderate, and there were no meaningful differences between the dropouts and the investigated sample, it is possible that the patients with better outcome of the schizophrenic disorder were lost, so that the results were biased towards the negative direction. This is not likely, because 4 of the 21 dropouts died (2 suicides and 2 probable suicides), and all calculations were done without their data (which reflects the worst possible outcome of the disorder).

   Because the age at first admission did not influence the outcome, the younger age of the dropouts is also not important in this connection. The dropouts had a shorter first inpatient episode than the follow-up patients (3.5 vs 5.7 months). However, this is not meaningful, because a longer duration of the first episode was correlated with a poorer outcome, so that only patients with a better outcome might have been missed.
5. In the present study first episode diagnoses were used. Eggers (1989) and Werry et al. (1991) demonstrated that patients with bipolar affective disorders were often misdiagnosed as schizophrenic in their first episode. However, in our sample only 2 (1.7%) patients were treated for a bipolar affective disorder in a further episode, but both had later schizophrenic episodes as well.
6. Comparing the two samples (adolescent and adult sample) the interpretation of the results is not without problems, because the design the two studies are based on is different: Each patient of the control group had an exact follow-up time interval of 5 years, whereas the assessment in the study group had a very wide range. However, for the sake of the first approach (to the knowledge of the authors) to compare the course of schizophrenia beginning in adolescence and adulthood, this shortcoming should be tolerated. Clearly, further research with regard to this point is necessary.

There are only few studies on schizophrenia in adolescence, particularly on the long-term outcome. In comparison with other studies dealing with schizophrenic psychoses starting in adolescence, our study had a much larger sample size. As Weiner (1982) and Werry et al. (1991) have found, our results underscore that the long-term outcome of schizophrenia starting in adolescence is generally less favourable than in adults.

Indeed, the relatively poor outcome of schizophrenic psychoses starting in adolescence was shown by several different variables: At follow-up 54% (52) of the patients still lived with their parents (that is an unusually high rate for 23-year-olds in Germany), 30% (29) of the patients lived semidependent or dependent, maintenance was still being provided in 82% (80) by parents, spouse or public assistance, 72% (70) were being treated as out- or inpatients, on evaluative measures 44% (43) were at least moderately impaired with regard to educational/occupational function, 58% (56) were at least moderately disabled with regard to social function and 73% (71) had at least one further schizophrenic episode. Interpreting these data it has to be considered that the evaluative measures (global assessment of social disability and of educational/occupational impairment) refer to impairments due to psychosis, whereas other measures, such as living situation and means of maintenance, also reflect living circumstances of healthy people at the same age (e.g. students living at home and financially dependent on parents). Unfortunately, precise data of healthy young people are not available.

Finally, the described comparison between the patients with schizophrenic psychoses beginning in adolescence and those beginning in adulthood revealed that the former group was more disabled with regard to social function. All this supports the worse outcome of schizophrenic psychoses starting in adolescence.

The best indicators for a worse outcome were a long duration of inpatient treatment at first admission and a high number of symptoms and a low social competence at discharge. This is in agreement with the results of Werry and McClellan (1992), who found that the state after first admission is one of the two best indicators of outcome in child and adolescent schizophrenia. The other indicator was premorbid personality. Abnormal premorbid personality was not assessed in the present study, but overinvolvement of family was found in 41% of the investigated schizophrenic patients, and this could indicate premorbid abnormalities.

What are the possible reasons for the poor outcome of schizophrenia in adolescence? Strangely, this topic is poorly addressed in the adolescent as well as in the adult literature. The following possible explanations can be considered:

1. The immaturity and the greater vulnerability of the central nervous system in childhood may cause a worse impact of the disorder compared with adults.
2. Agreement that there is a high frequency of premorbid personality abnormalities in schizophrenia beginning in adolescence (Werry 1992). Poor premorbid adjustment predicts an early age at first admission (Foerster et al. 1991) and can influence the course of the disorder negatively (Werry and McClellan 1992).
3. Numerous studies have demonstrated that obstetric complications are more common in schizophrenics than in normal subjects and in other psychiatric patients. Furthermore, schizophrenics with obstetric complications are more likely to exhibit ventricular enlargement and present earlier than those without such a history (see Castle and Murray 1991). The characteristics most frequently associated with increased ventricular size have been cognitive impairment, poor premorbid adjustment, more negative symptomatology, poor clinical outcome, poor employment record and poor response to neuroleptics (Castle and Murray 1991; Crow 1985; Pearlson et al. 1989). From this follows that early onset and poor outcome could be mediated by obstetric complications and ventricular enlargement.

4. Adolescents are to a high degree dependent on adults, especially on parents, possibly due to their immaturity. This means that familial adversities (Blanz et al. 1991) and negative interactions might influence early onset and promote a poor prognosis.
5. A severe illness like schizophrenia interrupts or negatively influences school/occupational and personality development. Thus, important developmental steps, such as finishing school education and financial independence, cannot be reached or can only be reached on a lower level. These impairments then can work as additional risk factors in the further course of the disorder.

Given limited current knowledge and the limited number of adolescents with schizophrenia seen by most child and adolescent psychiatrists, it is necessary to pool patients for further research (Werry and McClellan 1992). This means that, as suggested, multicenter studies are indicated and some uniformity of methodology (including the use of standardized instruments such as the DAS) is basic. A further aim is to conduct studies that test the hypotheses discussed herein, e.g. the meaning of obstetric complications and ventricular enlargement in adolescents and adults with schizophrenia.

Our results suggest that the treatment of schizophrenic psychoses starting in adolescence should begin as early as possible, because of the impact on social development. It is important not only to reduce the symptoms as quickly as possible (e.g. with medication), but to include the training of social skills in treatment programs.

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