European Child & Adolescent Psychiatry 8:
Suppl. 1, I/9–I/12 © Steinkopff Verlag 1999

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Childhood-onset schizophrenia: A follow-up study

Abstract This paper presents results from the UCLA Follow-Up Study of Childhood-Onset Schizophrenia Spectrum Disorders. Eighteen children with schizophrenia (SZ) were assessed 1 to 7 years following initial project intake. Results demonstrated significant continuity between SZ spectrum disorders in childhood and adolescence. Although not all children who presented initially with SZ continued to meet criteria for SZ spectrum disorder as they progressed through the follow-up period, rates of SZ spectrum disorders ranged from 78–89 % across the first three follow-up years. Rates of continuing SZ ranged from 67 % to 78 % across the three follow-up years and rates of schizoaffective disorder ranged from 11 % to 13 % across the three follow-up years. Variability in levels of functioning were observed with 45 % of the sample showing deteriorating course or minimal improvement and 55 % of the sample showing moderate improvement or good outcomes. This variability in outcome is comparable to that seen in adults with SZ, suggesting that with current treatments childhood-onset does not ensure a more severe disorder.

Key words Schizophrenia – follow-up

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Introduction

This paper presents results from the UCLA Follow-Up Study of Childhood-Onset Schizophrenia Spectrum Disorders. Data are presented on the developmental course of childhood-onset schizophrenia. These data are employed to address questions concerning the nosologic status of schizophrenia (SZ) with childhood-onset as discussed below.

Most cases of SZ have their onsets during late adolescence or early adulthood. Consequently, childhood-onset SZ is atypical by virtue of the early age of onset. Several hypotheses have been offered to explain this atypical early onset, including: 1) Childhood-onset SZ represents a particularly severe and chronic form of the illness with the very early onset reflecting a stronger biological disposition to the illness. 2) Childhood and later-onset SZ represent different illnesses. 3) Childhood-onset has little etiological significance, with childhood-onset cases representing those cases at the early end of the age of onset distribution. The data reported here address these hypotheses by presenting data on functioning as well as the degree of continuity between childhood and later SZ.

Methods

Description of the sample

We report outcome data for a sample of 18 children identified at the time of an acute psychiatric hospitalization. At the point of hospitalization and study enrollment, these 18 children met DSM-III criteria for schizophrenia. Diagnoses were derived using the Schedule for Affective Disorders and Schizophrenia for School-Age Children-Epidemiological Version (K-SADS-E (6)) and the Semi-Structured Kiddie Interview for Personality Syndromes (K-SKIPS (2)) conducted with the child and one parent. The K-SKIPS, based on the Structured Clinical

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Interview for DMS-III Disorders (SCID II (8)) and other interviews designed to assess schizotypal symptoms in childhood (4, 7) covers personality syndromes viewed as falling within the SZ spectrum. Because of controversy regarding the status of personality disorders in childhood, we refer to personality syndromes. In order for a child to be given a personality syndrome diagnosis (e.g., schizotypal) a minimum duration criteria of 1-year was applied. Final diagnoses were derived based on review of the interview results and all other information available on the child, including observation of the child's clinical status during hospitalization and results of other interviews and evaluations conducted during hospitalization. Two experienced clinicians had to agree on the diagnosis for a child to be included in this sample.

Table 1 summarizes the characteristics of the sample. As shown in Table 1, there is a high rate of other non-schizophrenia spectrum diagnoses in this sample. This was due in part to our procedure of suspending hierarchical diagnostic rules in order to provide a fuller description of children's clinical presentations. Thus, if a child met criteria for a diagnosis that diagnosis was given, regardless of whether the child met criteria for another more severe diagnosis. For example, children with schizophrenia (SZ) who met DSM III criteria for attention deficit disorder (ADD) were given the ADD diagnosis. Because ADD by DSM III criteria requires an onset prior to 6 years of age, and SZ typically has a later onset, 44 % of the SZ sample were given a diagnosis of ADD prior to the onset of their SZ. Although these children clearly met criteria for ADD based on interview and collateral information, it is unclear how these symptoms should be viewed in the context of the more severe schizophrenic disorder. For instance, did these early attentional symptoms represent the prodrome or precursor to the full blown schizophrenic syndrome? Or are both illnesses present in some cases?

Table 1 Description of follow-up sample

	Schizophrenia (n = 18)
% Male	72 %
Length of Follow-up	1-7 years
Age at Follow-up	11;7 – 19;10
Age > 12 yrs. at Follow-up	83 %
Follow-up > 3 yrs.	77 %
Other Diagnoses	
Attention Deficit Disorder (ADD)	44 %
Conduct/Oppositional Disorder	33 %
Depressive Disorder	55 %

Follow-up procedures

As shown in Table 1, follow-up assessments were conducted between 1 and 7 years following the initial assessment. Age at final follow-up was between 19 years 10 months and 11 years 7 months. The majority of the sample was followed up for a period exceeding 3 years and was over 12-years of age at the end of the follow-up interval. The child's diagnosis, symptomatology, and general functioning during the follow-up period was assessed using the Schedule for Affective Disorders and Schizophrenia for School-Age Children (K-SADS-E), the K-SKIPS, and the Social Adjustment Inventory for Children and Adolescents (SAICA (5)). As described elsewhere (1), these measures were administered both individually with the child and with one parent or caretaker. Clinical and school records were requested and available information reviewed. Diagnoses were derived independently by two diagnosticians, one of whom was always blind to the initial diagnosis. The reliability of diagnoses was excellent, kappa = 0.92, $p < 0001$. In two cases direct interviews with the child were not available. However, in both cases the parent interview information was supplemented by school and clinical records.

Results

Treatment

This is a sample of children who were receiving treatment in their communities. Because the sample is relatively recent (recruited during the 1980s), children were receiving relatively modern treatments. Outcomes were likely affected by the type, quality, timing, and amount of treatment children received. As shown in Table 2, all but one child, 95 % of the sample, were treated with antipsychotic medications. In four children with SZ, antipsychotic medications were supplemented or replaced with other medications. All children received some form of psychosocial intervention.

Table 2 Summary of treatment

	Schizophrenia (n = 18)	
Medication	f	%
Antipsychotic	13	72
Antipsychotic + Mood Stabilizer	4	22
No Medication	1	6

Table 3 Clinical outcomes for schizophrenia sample

	Follow-Up Year					
Diagnosis	Year 1		Year 2		Year 3	
	f	%	f	%	f	%
Schizophrenia	14	78	12	67	11	73
Schizo-Affective	2	11	2	11	2	13
Other	2	11	2	11	1	7
None	0	0	2	11	1	7
Total	18		18		15	

Table 4 Description of global adjustment and psychosocial functioning

Outcome Classification	Schizophrenia Sample (n = 18)
Deteriorating Course	17 %
Minimal Improvement	28 %
Moderate Improvement	28 %
Good Outcome	28 %

Clinical outcomes

Table 3 presents information concerning clinical outcomes. As shown in Table 3, the majority of these children continued to meet criteria for SZ over the course of the follow-up. SZ was diagnosed in 78 % of the sample at year 1, 67 % of the sample at year 2, and 73 % of the sample at year 3. Two children showed a more schizo-affective course, representing 11 % of the sample at years 1 and 2, and 13 % of the sample at year 3 due to a reduction in the number of children available for follow-up. No signs of SZ were evident for 2 children at year 1 (11 % of the sample). However, both of these children continued to present with mental health problems. At year 2, 2 children (11 % of the sample) presented with no evidence of psychiatric disorder. At year 3, 2 of the 4 children with nonschizophrenic outcomes were not available for follow-up, but one child with remission of SZ and no mental health problems continued to show no signs of SZ. Another child who showed remission of SZ but continuing ADD and conduct disorder, showed this same picture at year 3.

Global adjustment and psychosocial functioning

Children's levels of global adjustment and psychosocial functioning were classified into the following four categories based on their Global Adjustment Scale (C-GAS) scores at the end of their individual follow-up intervals: 1) Deteriorating course, with GAS scores that were lower at the end of follow-up than at initial entry into the project and fell below 40 at final follow-up indicating major impairment, 2) Minimal improvement cases, whose GAS scores were between 30 (Major impairment, unable to function) and 50 (Moderate impairment), 3) Moderate improvement cases, with GAS scores between 50 and 60 (Variable functioning with sporadic difficulties or symptoms in several areas), and 4) Good outcome cases, whose GAS scores were 60 or above. Table 4 presents the percentage of children falling within each of these categories.

These data highlight the variability in the level of functioning shown by children with SZ. Of the SZ sample, 45% showed deteriorating course or minimal improvement, underscoring the severe levels of impairment shown by some children with SZ. The rest of the sample showed more substantial improvement. Twenty-eight percent of the SZ sample received GAS scores of between 50 and 60 at their last follow-ups and were classified as showing moderate improvement. Finally, 28 % of the SZ sample were classified as showing good outcomes based on GAS scores of 60 or above at the final follow-up.

Discussion

The present results provide support for the hypothesis of continuity between SZ spectrum disorders in childhood and adolescence. Although some children did not present with continuing SZ spectrum disorders as they progressed through the follow-up period, rates of SZ spectrum disorders ranged from 78–89 % across the three follow-up years for children initially presenting with SZ. Over two thirds of the sample showed continuing schizophrenia across the three follow-up years (67 %–78 %), and rates of schizoaffective disorder ranged from 11 % to 13 % across the three follow-up years.

There was substantial variability in the levels of functioning observed among children with SZ, with 45 % of the SZ sample showing deteriorating course or minimal improvement and 55 % of the SZ sample showing moderate improvement or good outcomes. This variability in outcome is comparable to that seen in adults with SZ, suggesting that in terms of clinical outcomes, with current treatments childhood-onset does not ensure a more severe disorder.

Our data indicating that subgroups of children initially presenting with SZ developed other psychiatric disorders over time highlights the need for further work aimed at identifying the phenotypic boundaries of the SZ spectrum among children. The observation that roughly 11 % of our SZ sample devel-

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oped schizoaffective disorders is consistent with results of other follow-up studies that have found subgroups of children who initially presented with SZ but later developed bipolar or schizoaffective disorders (3, 9).

The results of the present study add to the relatively scant data base on childhood-onset SZ. It is important to note, however, that our sample is relatively small and additional follow-up studies of youth with childhood-onset SZ are needed. Additionally, the present data were based on DSM-III diagnoses and future work is needed to determine whether comparable findings would be obtained if had diagnoses were made using DSM-IV or ICD-10 criteria. As new medications and treatment strategies develop and are applied, outcomes may be enhanced and results of follow-up studies may differ.

In conclusion, our results are consistent with the hypothesis that childhood- and later-onset SZ represent the same illness, or set of illnesses, if etiologic heterogeneity within the broad category of SZ disorders is assumed. Our data showing variability in outcome do not provide strong support for the hypothesis that SZ with childhood-onset is a particularly severe and chronic form of the illness with a strong biological basis. However, we do not at this stage have data on biological and genetic variables. Outcomes may also have been enhanced by virtue of the fact that this was a relatively recent sample of children who were receiving modern pharmacologic and psychosocial treatment. Further research is needed to clarify the significance of childhood-onset and whether this atypical early onset reflects chance variation or a more severe variant of the illness with a stronger biological vulnerability.

Acknowledgment This research was supported by a grant from the John D. and Catherine T. MacArthur Foundation as part of their Network on Risk and Protective Factors in the Major Mental Disorders. This paper is dedicated to Michael J. Goldstein whose wisdom inspired and nurtured this work and whose friendship is dearly missed.

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