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The Evolution of Symptoms in Institutionalized Hebephrenic/Catatonic Schizophrenics

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Summary: The charts of 52 hebephrenic/catatonic schizophrenics requiring long-term institutionalization were selected from the Iowa 500 study and reviewed. The presence or absence of 28 different symptoms was noted on a year by year basis over a span of 35 years. Symptoms usually classified as positive symptoms of schizophrenia, such as hallucinations and delusions, were found to have earlier onset and greater tendency to resolve over time than symptoms usually classified as negative such as flat affect, decreased social interaction and sensorium defects.

Any theory about the aetiology of schizophrenia must explain the striking variations in signs and symptoms throughout the course of this debilitating disease. The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders*, 3rd Edition (DSM–III) (1980) describes these successive phases of variation as prodromal, active and residual. An understanding of the longitudinal course of the illness is necessary for researchers exploring biological and psychosocial variables, since it is possible that processes active in one stage may not be detectable during others.

Current knowledge about the course and outcome of schizophrenia has been reviewed in detail by the authors in a previous publication (Pfohl and Winokur, in press). While there have been some studies that attempt to look at global changes in the pathology of schizophrenics over a long period (Ciompi, 1980), there have been few attempts systematically to follow the course of individual symptoms over the duration of an illness which may cover decades.

One of the authors (G.W.) was impressed with the possibility of making a longitudinal study of individual schizophrenic symptoms while reviewing the charts from the Iowa 500 study. This study, which has been extensively described elsewhere (Morrison *et al*, 1972; Tsuang and Winokur, 1974) reviewed the charts of patients admitted to the Iowa City psychiatric hospital between 1935 and 1945. Two hundred patients who met Feighner criteria (Feighner *et al*, 1972) for schizophrenia were identified. One hundred and three of these met research diagnostic criteria for hebephrenic schizophrenia when all chart and follow-up information was considered. The criteria for hebephrenic schizophrenia are listed in Appendix A, and are described in detail elsewhere (Tsuang and Winokur, 1974). This group is referred to as hebephrenic/catatonic to highlight the finding of Tsuang and Winokur that many of these patients had, at times, motor symptoms traditionally associated with catatonic schizophrenia.

In the course of the Iowa 500 research project all four state Mental Health Institutes (MHIs) were visited and records of study patients evaluated. If the patients were chronically institutionalized, there were notes at intervals from six months to a year throughout the period of hospitalization. In cases where the patient was transferred from the MHI to a county home there were notes from the yearly evaluation by the MHI. Symptomatology preceding the first hospitalization was described in the admission notes and in extensive interviews with relatives. (These interviews were typed documents, several pages in length, prepared by psychiatric social workers and psychiatrists).

The value of this sample is enhanced by the fact that they received no psychotropic medication during the first 10 to 20 years after hospitalization.

Method

As already stated, the charts of 103 Iowa 500 hebephrenic/catatonic schizophrenics were reviewed. Of these, 52 charts had sufficiently comprehensive longitudinal information to be included in the study. Information was considered sufficiently comprehensive if annual psychiatric evaluations were documented for at least 12 consecutive years after the first admission. A patient could still be included if written

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evaluations were not available for some of the 12 years so long as the total number missed was five or less.

Each chart that met criteria for comprehensivity was reviewed by one of the authors. All notes from the Iowa City psychiatric hospital and the Mental Health Institute and all correspondence were evaluated. The patient's age at onset of symptoms and age at first hospitalization, the number of hospitalizations and the age at the last follow-up were recorded.

The presence or absence of 28 signs and symptoms was also noted. Operational definitions were devised for each symptom in order to guide interpretation of the chart material. The definitions are presented in Appendix B. Since terminology and thoroughness varied from note to note within the charts, some flexibility was necessary in applying them.

Two numbers were recorded for each of the 28 symptoms. The first number represented the patient's age at the time the symptom began. The second number indicated the age at which that symptom disappeared, if it did disappear. A disadvantage of this coding scheme is that a symptom that was intermittently present for 10 years would be coded similarly to one continuously present for ten years. An advantage is that it is relatively insensitive to cases where a symptom though actually present may have escaped mention by the attending physician during some years.

Results

Fifty-two patients, 33 males and 19 females, out of the original 103 catatonic/hebephrenic schizophrenics met criteria for adequacy of follow-up. Since adequate follow-up meant continued institutionalization, these 52 patients represent those with the worst outcome. Mean age of onset, time to first hospitalization and length of follow-up are summarized in Table I. Thirty-nine of the 52 patients, i.e. three-quarters, had at least 25 years of follow-up after the first hospitalization.

The mean number of hospitalizations for the sample was 2.8. A number of these reflected minor changes in symptomatology which resulted in transfer from a county home to a mental health hospital. If transfer from one form of institutional care to another was excluded, the patients averaged 1.6 hospitalizations before becoming chronically institutionalized. Three or more years of continuous institutionalization was defined as chronic. Twenty of the 52 patients had at least a partial remission after the initial onset of symptoms, during which they were able to return to some form of independent living, and six of these 20 were described by family and professionals during remission as being completely back to normal. The remissions almost always occurred within a year after the onset of symptoms. These figures are interesting, given that all 52 patients were eventually chronically institutionalized and that none had the benefit of psychotropic medication.

TABLE I
*Sample characteristics**

	Mean ± standard deviation (years)
Age of onset	21.3 ± 4.8
Number of years from onset to hospitalization	2.5 ± 3.6
Duration of follow-up (years)	30.0 ± 8.0
Age at last follow-up	53.8 ± 10.1
Number of hospitalizations	2.8 ± 1.7
Number of hospitalizations until chronic institutionalization	1.6 ± 1.2
Number of episodes	1.7 ± 1.3

*Sample size: 33 males; 19 females.

Table II reports on the longitudinal course of individual symptoms and reads as follows. Column 1 shows how many of the 52 patients had the given symptom at some time during their course of illness. Column 2 indicates how long on average, after the time of first hospitalization the symptom appeared. A negative number here indicates that it tended to occur before the first hospitalization. Column 3 indicates the number and percentage of patients showing the symptom who eventually lost it. (Thus, only 16 of the 37 patients who developed moderately impaired self-care ever returned to a normal level of self-care). Column 4 indicates the average number of years after first hospitalization at which the symptom was lost.

It should be noted that, for instance, moderately impaired self-care was scored as also present if the patient met criteria for severely impaired self-care, and this convention was used for all symptoms which were scorable at more than one level.

It can be noted from Table II that certain symptoms were particularly likely to be present during or before the year of first hospitalization. Productivity less than 50 per cent, lack of volition, inappropriate affect, loose association in speech, persecutory delusions, other delusions and auditory hallucinations fell into this category. These symptoms were all common; they were individually present in from three-quarters to all of the patients at some time during the illness.

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TABLE II

Numbers and percentage equivalents of 52 hebephrenic schizophrenics developing and losing symptoms and mean number of years from time of first hospitalization to symptom onset and resolution respectively

Symptom	Onset		Resolution		
	No. and % of patients	Mean no. of years since first hospitalized	No. and % of patients	Mean no. of years since first hospitalized	Symptom type: positive or negative
Social performance:					
Moderately impaired self-care	37 (71)	8.4	11 (30)	20	−
Severely impaired self-care	23 (44)	8.2	16 (70)	12	−
Moderately impaired social interaction	49 (94)	1.6	9 (18)	12	−
Severely impaired social interaction	32 (61)	7.9	11 (34)	20	−
Productivity less than 50%	52 (100)	−1.1	3 (5)	13	−
No ability to do any work	36 (69)	6.5	13 (36)	16	−
Lack of volition	49 (94)	0.2	2 (4)	22	−
Motor symptoms:					
Hypoactive or catatonic	40 (77)	5.5	18 (45)	11	−
Waxy flexibility	8 (15)	7.4	7 (87)	12	?
Bizarre behaviour	38 (73)	3.3	22 (58)	13	+
Mannerisms	31 (60)	5.9	15 (48)	9	?
Tics and grimaces	24 (46)	2.6	17 (72)	18	?
Affect and mood:					
Elevated mood	4 (8)	4.7	3 (75)	10	+
Depressed mood	16 (31)	1.8	15 (94)	7	+
Flat affect	49 (94)	5.0	3 (6)	23	−
Inappropriate affect	45 (86)	−0.3	19 (42)	15	+
Speech-form:					
Decreased speech	31 (60)	5.7	9 (29)	18	−
Blocking	27 (52)	1.8	7 (26)	9	−
Loose association	43 (83)	0.6	7 (16)	10	+
Incoherence	41 (79)	5.5	7 (17)	10	+
Speech-content:					
First rank symptoms	21 (40)	2.5	13 (62)	13	+
Persecutory delusions	44 (85)	0.2	27 (61)	11	+
Grandiose delusions	17 (33)	2.6	11 (65)	7	+
Other delusions	32 (61)	−0.3	15 (47)	9	+
Auditory hallucinations	40 (77)	0.8	25 (62)	12	+
Sensorium:					
Orientation problems	37 (71)	8.4	11 (30)	20	−
Memory deficits	24 (46)	10.6	2 (8)	18	−
Cognitive deficits	18 (35)	7.3	1 (6)	2	−

The frequency of some of them may be artificially inflated, due to the criteria by which the original 103 hebephrenic schizophrenics and subset of 52 chronic cases were chosen.

A second group of symptoms was remarkable for the fact that their average time of onset was 5 or more years after the first hospitalization. Impaired self-care, severely impaired social interaction, inability to do any work, hypoactivity, waxy flexibility, mannerisms, flat affect, decreased speech, incoherent speech and defects of sensorium fell into this category.

A third category of symptoms overlapped with the first two. This comprised symptoms which had disappeared by the time of the last follow-up in over

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50 per cent of the patients who had originally had them. It included severely impaired self-care, waxy flexibility, bizarre behaviour, tics and grimaces, elevated mood, depressed mood, persecutory delusions, grandiose delusions, auditory hallucinations and first rank symptoms. In most cases these symptoms had disappeared before the dawning of the phenothiazine era.

The symptom of depressed mood was not rated as present unless it continued for at least one month. It is interesting that while 16 of the 52 patients had this symptom, usually early in the course, all but one subsequently lost it. Inappropriate affect was found in 45 of the 52 patients. Nineteen of these eventually lost it and usually flatness of affect was noted as replacing it. All the patients had either flat affect or inappropriate affect at some time during the course of their illness, since at least one of these is required for the diagnosis of schizophrenia of hebephrenic/catatonic subtype (Tsuang and Winokur, 1974).

Discussion

Chart review studies must always be suspect, since the original method of data collection is not controlled or standardized by the investigator. In a study which reviews charts covering a span of 35 years it is always possible that changes in clinical fashion may have influenced the frequency with which certain symptoms were noted. It is possible that symptoms such as moderately impaired self-care and tics and grimaces never really improved, but rather that clinicians no longer recorded them if they were the norm among chronically institutionalized mental patients.

The findings in this study regarding symptoms such as hallucinations and delusions are in agreement with previous studies. Bridge *et al* (1978) summarize several studies which show that hallucinations and delusions are much less frequent after the first decade in chronically hospitalized schizophrenics. Flat affect, which we found to have a relatively late onset but high frequency among our sample, has been previously noted to correlate with chronicity (Strauss and Carpenter, 1974; Knight *et al*, 1979).

It has been suggested that the various symptoms of schizophrenia can be categorized as positive or negative, and that the negative symptoms are less responsive to medication, more often present in chronic cases and more often associated with enlarged cerebral ventricles (Strauss *et al*, 1974; Johnstone *et al*, 1978; Andreasen, 1982). In looking at the data from the present study it appears that symptoms usually considered negative are likely to have a later onset and to be persistent. Since there is no universal agreement as to which symptoms are conceptually positive and which are negative, we asked Nancy Andreasen, who was blind to our data, to classify each of the symptoms defined in Appendix B. Her classification was based in part on her own study of another set of 52 schizophrenics admitted to the Iowa City psychiatric hospital over the past two years (Andreasen, 1982), and is presented in the fifth column of Table II. (A question mark indicates that the symptom was not clearly positive or negative).

TABLE III

Association of positive vs. negative classification with onset and persistence of 25 symptoms

		Onset		Persistence	
		Early	Late	No	Yes
Symptom classification	Positive	10	1	7	4
	Negative	4	10	1	13
Significance level (Fisher's exact)		P = .004		P = .007	

Table III displays the association between positive/negative classification and onset and persistence of symptoms. Symptoms that developed, on the average, 5 or more years after the first hospitalization were considered to have a late onset. All others were classified as early onset. A symptom was classified as persistent if it was present until the last follow-up in more than half of all patients who had ever had it. The symptoms on each side of Table III sum to 25 since this is the number that were clearly classified as positive or negative.

A Fisher's exact test was used, since both two-by-two tables produced expected values that summed to less than 5. This represents a conservative test of association, since no assumption is made about the distribution of times of onset or percentages of patients with continuing symptoms. Both tests were significant at less than the 0.01 level.

While the cohort of patients examined here predated the antipsychotic drug era, it may not be entirely correct to assume that our findings represent the natural history of hebephrenic schizophrenia. Wing and Brown (1970) have suggested that various features of institutionalization may result in secondary handicaps which are not part of the illness itself. They support this conclusion with data from a large multicentre study in which chronically instituionalized schizophrenics were provided with a more normal social environment and greater opportunity for productive employment of time. The patients were significantly improved at the end of five years, on measures of both florid (positive) and negative symptoms.

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Conclusions

The distribution of symptoms in schizophrenia is not static, but changes with the passage of time. The data and statistics in the present study support the conclusion that symptoms often conceptualized as negative have a later onset and greater persistence over time than those conceptualized as positive, at least among chronically institutionalized, generally unmedicated, hebephrenic/catatonic schizophrenics. Systems for subclassifying schizophrenia must take into account the fact that the symptoms exhibited in a given patient may change dramatically over time even when pharmacological intervention is excluded.

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Appendix A

Criteria for hebephrenic schizohprenia

A. Feighner criteria (for a diagnosis of definite schizophrenia)
B. Dominant feature:
   (1) Disorganized thought
C. Other manifestations:
   (1) Affect changes: (one of two)
      (i) Inappropriate affect
      (ii) Flat affect
   (2) Behavioural symptoms (one of two)
      (i) Bizarre behaviour
      (ii) Motor symptoms with hebephrenic or catatonic traits
   (3) Age of onset and sociofamilial data (one of three)
      (i) Onset before age 25 years.
      (ii) Unmarried or unemployed.
      (iii) Family history of schizophrenia.

Appendix B

Definitions of symptoms rated in chart review

Social performance

Moderately impaired self-care
—Tends to dress in a sloppy manner, uncombed hair, etc.

Severely impaired self-care
—Does not adequately feed self or eliminate bodily excretions in bathroom without help; must be present at least one month to score as present.

Moderately impaired social interaction
—Initiates interaction with others less than twice a week.

Severely impaired social interaction
—Ignores or walks away from attempts by others to interact most of the time.

Productivity less than 50 per cent
—Productivity is less than one-half what it was at highest level.

No ability to do any work
—Unable to do even simple housekeeping-type chores.

Loss of volition (avolition)
—Loss of interest, withdrawal, aversion, seclusion, lack of motivation, inertia.

Motor symptoms

Hypoactive or catatonic
—If left to self spends at least half of waking hours in one place.

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Waxy flexibility
—Does not resist changes in body position on manipulation by examiner, but maintains whatever position left in for at least one minute.

Bizarre behaviour
—e.g. arranges all objects in a room in shape of triangles; walks in a circle around anyone he or she passes.

Mannerisms
—Spends more than half an hour per day with some simple repetitive movement, e.g. tapping knee with hand.

Tics and grimaces
—Sudden muscle contractions followed by immediate relaxation.

Affect and mood

Elevated mood
—Elated: smiling, laughing, displaying enthusiasm without evidence of depressive symptoms for at least four consecutive weeks.

Depressed mood
—Depressed: crying, frowning, expressing dissatisfactions for at least four consecutive weeks without evidence of symptoms of elation.

Flat affect
—Reference in chart to decreased range of emotion or flat facies.

Inappropriate affect
—Expressing a definite emotional reaction which is contrary to what the situation should logically elicit.

Speech-form

Decreased speech
—Less than 10 words per day, or mute.

Blocking
—Sudden pause without finishing the thought after which patient never does finish the thought he/she was leading towards.

Loose association
—Ideas slip off one track on to another that may or may not be related.

Incoherence
—Unable to express ideas comprehensibly at least a quarter of the time.

Speech-content

First rank symptoms
—Thought broadcasting or withdrawal or thoughts heard as if spoken aloud; made to have feelings, impulses, thoughts or actions; voices keep a running commentary on actions.

Persecutory delusion
—Persecutory delusions

Grandiose delusions
—Grandiose or religious delusions

Other delusions
—Other delusions

Auditory hallucinations
—Auditory hallucinations

Sensorium

Orientation problems
—Present if more than five days out on date or more than one day out on day of week.

Memory deficits
—Remembers fewer than two out of three objects after five minutes, or does not know what activity he/she pursued the day before, or does not know name of own home town.

Cognitive deficits
—Cannot calculate change from a dollar, misses more than 25 per cent of serial seven subtractions or cannot say how an orange is like an apple.

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