Characteristics of the Retrospectively Assessed Prodromal Period in Hospitalized Patients With First-Episode Nonaffective Psychosis: Findings From a Socially Disadvantaged, Low-Income, Predominantly African American Population

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Objective: Because many heterogeneous symptoms and substantial psychosocial impairment develop during the prodrome of nonaffective psychosis, it is imperative to further characterize the prodrome, both retrospectively and prospectively. This study describes the prodromal period of 109 hospitalized first-episode patients from an urban, socially disadvantaged, predominantly African American population.

Method: Detailed data were gathered using established measures. Diagnoses of psychotic disorders were determined with the Structured Clinical Interview for *DSM-IV* Axis I Disorders. The prodromal period was described, exploratory factor analysis was conducted to assess the latent structure of 14 prodromal features, and patients with and without a retrospectively determined prodrome were compared on a number of sociodemographic and clinical variables.

Results: Some 76 patients (69.7%) had an identifiable prodrome, and the median duration of the prodrome was 107.7 weeks. The most prevalent prodromal features were deterioration in role function (65.8%), suspiciousness (63.2%), social withdrawal (60.5%), and trouble with thinking (57.9%). Factor analysis revealed 3 factors, termed *depressive/deficit, subthreshold positive*, and *brief, intermittent psychotic symptoms*, which were highly consistent with recently described prodromal syndromes in prospective research efforts. Patients without an identifiable prodrome had higher mean social functioning scores—in social engagement, prosocial, and employment domains—compared to those with an identifiable prodrome. Only 11 participants (14.5%) had sought professional help during the prodrome.

Conclusions: Given the highly variable duration and phenomenology of the prodrome, and the fact that relatively few individuals in this sample had sought professional help during their prodromal period, further research is needed to inform efforts aimed at identification of and intervention during the prodromal period of nonaffective psychosis.

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The term *prodrome* refers to the development of early signs and symptoms prior to the characteristic symptomatology of an acute, full-blown disorder.[1] The schizophrenia prodrome has been conceptualized retrospectively as a prepsychotic state (an attenuated form of psychosis) or prospectively as a syndrome conferring an increased vulnerability to developing psychosis.[2] Prodromal features include nonspecific psychiatric symptoms, early negative symptoms, and subthreshold or attenuated positive symptoms and disorganization. Nonspecific symptoms include anxiety, dysphoria, irritability, and sleep disturbance; early negative symptoms are typified by anhedonia, apathy, asociality, avolition, blunted affect, impaired concentration, low energy, and social withdrawal; and subthreshold positive symptoms include ideas of reference, brief and intermittent hallucinations or delusions, suspiciousness, perceptual abnormalities, unusual thought content, and trouble with thinking.[3–10]

Approximately 80% of patients with schizophrenia remember their prodromal phase.[11] Though traditionally viewed as an inherently retrospective construct, attempts to prospectively identify potentially prodromal adolescents and young adults have begun in recent years. In doing so, the prodrome is conceptualized prospectively as an "at-risk mental state,"[12] indicating that an affected person is at that time more likely to develop psychosis in the near future than someone without such symptoms. If symptoms resolve, then the degree of increased risk may diminish as well.[13] Considerable research has begun attempting to accurately identify which patients with putative prodromal symptoms will later develop schizophrenia.[13,14] In an effort to improve the accuracy of prospective prediction of initial psychosis, attempts to characterize the prodrome include groupings of multiple prodromal symptoms and other known associated risk factors (eg, genetic risk determined by family history of psychotic illness, the presence of schizotypal personality disorder) into clinically relevant syndromes. The Personal Assessment and Crisis Evaluation (PACE) program in Australia, and the Prevention through Risk Identification, Management and Education (PRIME) program in North America, have developed descriptions of 3 types of "ultra-high risk status": an attenuated positive symptom syndrome; a brief, intermittent psychosis syndrome; and a genetic risk and recent deterioration syndrome.[1,10,15–17] Similarly, the Hillside Recognition and Prevention program has delineated a "clinical high risk (CHR) status" that involves categorization into CHR– (attenuated negative or disorganized symptoms)

or CHR+ (attenuated positive symptoms and attenuated negative/disorganized symptoms).[18,19]

Numerous symptoms and a substantial level of disability and deterioration in functioning often develop during the prodromal phase of psychotic disorders.[1,7,13,20–23] That is, the social disability associated with schizophrenia often develops long before formal diagnosis or initiation of treatment.[21,24] Additionally, studies involving individuals at high risk for psychosis have found that neuropsychological deficits in this population are associated with poor social and role functioning.[25] Meaningful levels of symptoms, functional disability, and cognitive impairment suggest a potential point of therapeutic intervention prior to the development of psychotic symptomatology. In fact, in some settings, psychiatric services are sought by some individuals before or during the prodrome,[26] further indicating that these patients form a clinical population deserving of focused research.

While ongoing prospective prodromal/high-risk research is critical, understandings of the prodrome also can continue to be informed by retrospective prodromal research conducted at the time of the first evaluation and treatment for psychosis. To date, most retrospective research on the prodrome has focused on nonminority populations. For example, although prior studies were commonly conducted in semiurban areas and likely included some minority participants, the authors know of no studies focusing on the prodrome in a predominantly African American population (eg, a MEDLINE search combining the terms *African American* or *African Americans* and *prodrome* revealed no published citations at the time of writing of this report). Despite this lack of research, prior studies indicate that first-episode patients from urban, minority populations,[27–31] including urban African Americans,[32,33] have protracted treatment delays and less than optimal pathways to care. This suggests that the phenomenology and course of their prodromal syndromes also should be characterized.

The current descriptive study—conducted in a sample of urban, socially disadvantaged, low-income, predominantly African American, hospitalized first-episode patients—had 5 objectives. First, the proportion of first-episode patients who had retrospective evidence of a prodrome was determined and the median duration of the prodrome was calculated. Second, the prevalences of 14 retrospectively assessed prodromal signs and symptoms were examined. Third, intercorrelations among these specific prodromal signs and symptoms were computed, and an exploratory factor analysis was conducted. Fourth, participants without a retrospectively determined prodromal period were compared to those with an identifiable prodrome in terms of a number of select sociodemographic and clinical variables. Fifth, the proportion who reported having sought professional help during the prodrome was assessed.

METHOD

Setting and Sample

Participants involved in this analysis—all of whom were hospitalized in a psychiatric unit of a large, university-affiliated, public-sector hospital or an urban county psychiatric crisis center—were enrolled in a study investigating potential determinants of the duration of untreated psychosis. Both settings care for patients who have public-sector insurance (eg, Medicaid) or no health insurance and serve a predominantly low-income, urban, African American population in Atlanta, Georgia. Although the majority of uninsured first-episode patients requiring hospitalization are admitted to these 2 psychiatric units within 2 of the counties of this metropolitan area, patients with public or private insurance may be admitted to private psychiatric units as well. For the baseline portion of the overarching study, patients completed a clinical research assessment during hospitalization, after acute psychosis was stabilized sufficiently to allow for informed consent and research participation. This study was approved by all relevant institutional review boards.

The current study included 109 participants (83 males and 26 females) with first-episode nonaffective psychosis recruited between July 2004 and June 2008. Inclusion criteria required that patients were aged 18–40 years, were able to speak English, had a Mini-Mental State Examination (MMSE)[34,35] score of ≥ 23, and were able to give informed consent after a full explanation of procedures and possible benefits and risks was provided. Exclusion criteria included the presence of a significant medical condition that could compromise ability to participate in the evaluation, known mental retardation (as determined by the patient's, family's, or treating clinician's report of a prior diagnosis), prior outpatient antipsychotic treatment of > 3 months duration, and previous hospitalization for psychosis prior to 3 months before index hospitalization.

This sample was recruited from 281 consecutive referrals. Among the 89 ineligible for participation, 19 had history of > 3 months of prior antipsychotic treatment or a prior hospitalization, 13 were outside the age range of 18–40 years, 12 did not receive a clinical diagnosis of nonaffective psychosis, 11 were referred from a site not participating in the study, 5 were deemed to not be in a first episode of psychosis, 4 were unable to speak English, 3 did not have the capacity to give informed consent, 2 scored < 23 on the MMSE, 2 had a previous diagnosis of mental retardation, and 18 were not eligible for other reasons. Of the 192 eligible patients, 52 did not participate due to refusal and 31 were discharged from the hospital before an assessment could be conducted.

Instruments

Basic sociodemographic data were obtained. Diagnoses of psychotic disorders and substance use disorders were determined with the Structured Clinical Interview for *DSM-IV* Axis I Disorders (SCID-I),[36] using all available sources of data, including the patient assessment, a thorough chart review, and an informant/family member interview when possible. Basic clinical data were collected, including history of treatment-seeking and hospital length of stay. Symptoms were rated with the Positive and Negative Syndrome Scale (PANSS),[37] using data gathered from a chart review and an in-depth semistructured

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Table 1. Sociodemographic Characteristics of Hospitalized Patients With a First Episode of Nonaffective Psychosis (N = 109)

Characteristic	Value[a]
Age, mean ± SD, y	23.1 ± 4.7
Gender, male	83 (76.1)
Race/ethnicity	
Black/African American	98 (89.9)
White/European American	7 (6.4)
Asian American	2 (1.8)
Level of educational attainment	
Did not graduate high school	48 (44.0)
High school graduate	21 (19.3)
Trade or vocational school	6 (5.5)
Some college	23 (21.1)
College graduate	10 (9.2)
Marital status	
Single and never married	100 (91.7)
Married or living with a partner	5 (4.6)
Divorced	4 (3.7)
Employed during the month prior to hospitalization	42 (38.5)
Who the patient lived with prior to admission	
Alone	10 (9.2)
With family members	76 (69.7)
With boyfriend, girlfriend, partner, or spouse	5 (4.6)
With friends	8 (7.3)
Homeless	4 (3.7)
Other	6 (5.5)
History of incarceration	63 (57.8)

[a]Values are shown as n (%) unless otherwise stated.

interview focused on the patient's recent (past-month) symptoms.

To address the complexities involved in pinpointing exact dates for the onset of prodromal and psychotic symptoms, conventions were employed as described previously,[32,38] such as extensive cross-referencing with milestones and memorable anchoring events (eg, birthdays, holidays). Consensus-based best estimates of the onsets of prodrome and psychosis were derived using both patient and informant/family member data (when available) from the Symptom Onset in Schizophrenia (SOS)[39] inventory and select items from the semistructured Course of Onset and Relapse Schedule/Topography of Psychotic Episode[40] interview. These instruments were selected to provide 2 approaches to deriving dates of onset using structured, standardized techniques. Dating the onset of the prodrome was operationalized as the date of first prodromal symptom(s), from among 14 provided in the SOS, contiguous (without clearly discernible periods of wellness intervening) with subsequent onset of psychosis.[41] Duration of prodrome was defined as the number of weeks from onset of prodromal symptoms to onset of psychosis. Regarding the latter time point, dating the onset of psychosis was operationalized as the date at which hallucinations or delusions were estimated to have crossed a PANSS threshold of ≥ 3 for either or both of those items.

Social behaviors and functioning were assessed with the Social Functioning Scale (SFS),[42] a reliable and valid 71-item questionnaire specifically developed for assessing individuals with schizophrenia. Items inquire into abilities and performance in 7 areas: social engagement/withdrawal, interpersonal behavior, independence-performance, recreation, prosocial, independence-competence, and employment. Higher scores indicate higher levels of social competence.

Data Analysis

Basic descriptive statistics were examined for sociodemographic and clinical variables. Correlations among the SOS items (14 prodromal signs and symptoms) were calculated. Principal components analysis was conducted, followed by exploratory factor analysis with varimax rotation. Correlations between derived "subscale" scores then were assessed. Independent samples Student *t* tests were used to compare patients with and without a retrospectively determined prodrome on a number of variables. All analyses were conducted using SPSS 15.0 (SPSS Inc, Chicago, Illinois).

RESULTS

Among the 109 patients, the most common diagnosis was schizophrenia, paranoid type (n = 48, 44.0%), followed by schizophreniform disorder (n = 22, 20.2%), other schizophrenia subtypes (n = 14, 12.8%), psychotic disorder not otherwise specified (n = 12, 11.0%), schizoaffective disorder (n = 8, 7.4%), brief psychotic disorder (n = 4, 3.7%) and delusional disorder (n = 1, 0.9%). Sociodemographic characteristics of the sample are shown in Table 1. The mean ± SD age was 23.1 ± 4.7 years (range: 18–39), 83 (76.1%) of the patients were male, and 98 (89.9%) self-identified as African American. Despite the fact that all patients were ≥ 18 years of age, nearly half of the sample (n = 48, 44.0%) had not graduated from high school.[43] Almost all of the participants (n = 100, 91.7%) were single and never married, only 42 (38.5%) had been employed during the month prior to hospitalization, and 76 (69.7%) had been living with family members prior to admission. Remarkably, the majority of the patients (n = 63, 57.8%) had been incarcerated at least once (C.E. Ramsay, MPH, unpublished data, 2010), further attesting to the sample's level of psychosocial adversity.

Thirty-three patients (30.3%) were assessed to have no evidence of a prodrome. Among the 76 (69.7%) patients with an identifiable prodrome, the median duration was 107.7 weeks (mean ± SD: 148.6 ± 140.7; range: 4.0–482.1). Prevalences of specific prodromal signs and symptoms meeting the SOS-defined prodromal threshold are shown in Table 2. Among the patients having had a prodrome, 50 (65.8%) reported deterioration in role function, 48 (63.2%) described suspiciousness, 46 (60.5%) endorsed social withdrawal, and 44 (57.9%) had trouble with thinking during the prodromal period. Among the 74 patients with ratings on all 14 prodromal symptoms, the numbers of prodromal symptoms that were endorsed are shown in Table 3. The majority (n = 60, 81.1%) reported ≥ 4 signs and symptoms, and 13 (17.7%) reported ≥ 8.

Table 4 displays statistically significant correlations between the 14 prodromal signs and symptoms, which were generally modest to moderate in magnitude. The strongest

Table 2. Prevalences of Specific Prodromal Signs and Symptoms Meeting the Symptom Onset in Schizophrenia–Defined Prodromal Threshold (n = 76)

Sign/Symptom	n (%)
Dysphoric mood	26 (34.2)
Sleep disturbance	37 (48.7)
Ideas of reference	27 (35.5)
Suspiciousness	48 (63.2)
Unusual thought content	31 (40.8)
Trouble with thinking	44 (57.9)
Perceptual abnormalities	22 (28.9)
Brief, intermittent hallucinations	25 (32.9)
Brief, intermittent delusions	14 (18.4)
Deterioration in role function	50 (65.8)
Social withdrawal	46 (60.5)
Avolition	28 (36.8)
Decreased expression of emotion	13 (17.1)
Decreased experience of emotion	11 (14.5)

correlations were between suspiciousness and ideas of reference (0.48), decreased experience of emotion and decreased expression of emotion (0.41), avolition and ideas of reference (0.38), and unusual thought content and ideas of reference (0.38). All other correlations were ≤ 0.32. These modest to moderate positive coefficients indicated that the correlation matrix was factorable.

An initial principal components analysis revealed 5 factors with eigenvalues > 1.0, accounting for 59.0% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.62. Examination of initial eigenvalues, cumulative proportion of variance explained, and the scree plot revealed that 3 factors were relevant for further analysis (with initial eigenvalues of 2.80, 1.90, and 1.33). The factor analysis was then limited to these 3 factors, which accounted for 43.1% of the variance. Extraction communalities of the 14 items (which represent the proportion of variance in the item accounted for by the factors) ranged from 0.05 for social withdrawal to 0.56 for brief and intermittent hallucinations.

The factor solution, after varimax rotation, revealed the factor loadings shown in Table 5, based on the a priori decision that items with factor loadings ≥ 0.30 would be deemed meaningful, and that only the highest factor loading for each item would be considered. The first factor, which hereafter is referred to as *depressive/deficit*, included 6 items: dysphoric mood, sleep disturbance, deterioration in role function, avolition, decreased expression of emotion, and decreased experience of emotion. The second factor, called *subthreshold positive*, included 4 items: ideas of reference, suspiciousness, unusual thought content, and perceptual abnormalities. The third factor, called *brief, intermittent psychotic symptoms*, included 2 items: brief and intermittent hallucinations, and brief and intermittent delusions. Cronbach α internal consistency coefficients for these 3 factors were .63, .56, and .55, respectively, indicating an adequate level of internal consistency (though the limited number of items in each factor must be recognized). "Subscale" scores were derived by summing the number of items endorsed from among those items in each factor with loadings ≥ 0.30. The correlation between the depressive/deficit and subthreshold positive domain scores was $r = 0.14$ (not significant), the correlation between the depressive/deficit and brief, intermittent psychotic symptoms domain scores was $r = 0.10$ (not significant), and the correlation between the subthreshold positive and brief, intermittent psychotic symptoms domain scores was $r = 0.33$ ($P = .05$), indicating that the factor analysis resulted in 3 quite distinct factors, though the latter 2 were modestly correlated.

Table 3. Number of Prodromal Signs and Symptoms Endorsed (n = 74)

No. of Signs/Symptoms	n (%)
1	3 (4.1)
2	4 (5.4)
3	7 (9.5)
4	14 (18.9)
5	8 (10.8)
6	10 (13.5)
7	15 (20.3)
≥ 8	13 (17.7)

The 33 participants without evidence of a prodrome were compared with the 76 with an identifiable prodrome in terms of the following variables: age, gender, years of education completed, history of incarceration, the presence of alcohol abuse or dependence, the presence of cannabis abuse or dependence, duration of untreated psychosis, PANSS subscale scores, SFS subscale scores, and hospital length of stay. Among these variables, only 3 were significantly different between the 2 groups. Specifically, first-episode patients without an identifiable prodrome had a higher mean ± SD SFS social engagement subscale score (9.9 ± 2.4) compared to those who had experienced a prodrome (8.4 ± 3.1; $t_{94} = 2.61$, $P = .01$). Similarly, those without an identifiable prodrome had a higher mean ± SD SFS prosocial subscale score (25.7 ± 10.3) compared to those who described having had a prodrome (19.4 ± 11.2; $t_{94} = 2.49$, $P = .02$). Of note, these 2 SFS subscale scores, which reflect social competence prior to hospitalization, were modestly, though not strongly, correlated ($r = 0.29$, $P = .004$). Finally, those without an identifiable prodrome had a higher mean ± SD SFS employment subscale score (6.3 ± 2.7) compared to those who endorsed having experienced a prodrome (5.0 ± 2.4; $t_{92} = 2.42$, $P = .02$).

Of the 76 patients describing a prodromal period, only 11 (14.5%) had sought professional help during the prodrome: 3 saw a primary care/family physician, 6 visited a mental health professional, and 1 had contact with a police officer specifically due to psychiatric symptoms.

DISCUSSION

A variety of symptoms and a substantial amount of disability commonly develop during the prodrome. This, along with the need for improved accuracy in the prospective prediction of initial psychosis, suggests that ongoing research, both retrospective and prospective, on the prodromal phase of schizophrenia is critical. This study described the retrospectively assessed prodromal period in a sample of urban, socially disadvantaged, low-income, predominantly African American, hospitalized first-episode patients. Just

Table 4. Correlations Between Prodromal Signs and Symptoms[a]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Dysphoric mood														
2. Sleep disturbance														
3. Ideas of reference														
4. Suspiciousness	0.24*		0.48**											
5. Unusual thought content			0.38**											
6. Trouble with thinking				0.31**	0.27*									
7. Perceptual abnormalities				0.32**										
8. Brief, intermittent hallucinations							0.32**							
9. Brief, intermittent delusions								0.32**						
10. Deterioration in role function							0.31**							
11. Social withdrawal														
12. Avolition			0.38**											
13. Decreased expression of emotion												0.23*		
14. Decreased experience of emotion		0.26*								0.27*		0.30*	0.41**	

[a]Only statistically significant correlations are shown.
*The correlation is statistically significant at the $P < .05$ level.
**The correlation is statistically significant at the $P < .01$ level.

Table 5. Rotated Factor Loadings for the 14 Prodromal Signs and Symptoms[a]

Item	Factor 1, "Depressive/Deficit"	Factor 2, "Subthreshold Positive"	Factor 3,"Brief, Intermittent Psychotic Symptoms"
Dysphoric mood	0.31		
Sleep disturbance	0.51		
Ideas of reference		0.53	
Suspiciousness		0.58	
Unusual thought content		0.39	
Trouble with thinking[b]			
Perceptual abnormalities		0.48	
Brief, intermittent hallucinations			0.72
Brief, intermittent delusions			0.50
Deterioration in role function	0.52		
Social withdrawal[b]			
Avolition	0.57		
Decreased expression of emotion	0.43		
Decreased experience of emotion	0.52		

[a]Only factor loadings ≥0.30 are shown.
[b]These items did not load onto any of the 3 factors.

under three-fourths of these patients (approximately 70%) had evidence of a prodromal period, and, consistent with prior findings in which the prodrome was shown to last approximately 2–5 years,[1] the median duration of the prodrome among these patients was just over 2 years.

Furthermore, findings demonstrated that the most commonly endorsed prodromal symptoms were comparable to those found to be predictive of transition to a psychotic disorder.[4–6,8–10,23] Specifically, among those with an identifiable prodrome, more than half endorsed deterioration in role function, suspiciousness, social withdrawal, or trouble with thinking during the prodromal period, while greater than one-third endorsed sleep disturbance, unusual thought content, avolition, ideas of reference, or dysphoric mood. Although it would have been interesting to compare prodromal characteristics across diagnostic groups, this was not feasible given the relatively small sample sizes within individual diagnoses (eg, only 4 patients were diagnosed with brief psychotic disorder). Similarly, it would be beneficial to examine characteristics of the prodrome in relation to socioeconomic status and race/ethnicity; however, this was not possible due to the homogeneity of the sample in terms of these demographic characteristics.

Results from the exploratory factor analysis of retrospectively assessed prodromal features revealed interesting similarities to categories that have been developed for the prospective assessment of prodromal syndromes. For example, the first factor (depressive/deficit) included attenuated negative and depressive symptoms such as deterioration in role function, decreased expression of emotion, and dysphoric mood, which are part of the criteria for the CHR–prodromal syndrome in Cornblatt's high-risk classification.[18] The depressive/deficit factor may also be consistent with the PACE and PRIME UHR criteria for the genetic risk and recent deterioration prodromal syndrome. The second factor (subthreshold positive) included attenuated positive symptoms such as perceptual abnormalities, suspiciousness, and unusual thought content, which are characteristic of the

attenuated positive symptom prodromal syndrome classification in the PACE and PRIME criteria. The third factor (brief, intermittent psychotic symptoms) included brief, intermittent hallucinations and delusions, which are reflective of the brief, intermittent psychotic symptoms prodromal syndrome also defined by PACE and PRIME for prospective prodromal research.

Individuals with a prodrome had significantly lower scores on the social engagement, prosocial, and employment subscales of the SFS compared with those who did not report having had prodromal symptomatology, supporting recent literature demonstrating that substantial social dysfunction accumulates during the prodromal phase.[20,25,44] Difficulties in the areas of social engagement and prosocial interactions lead to increasing levels of social isolation, indicating an important area warranting further investigation as a potential point of psychosocial intervention within the prodromal period. It is likely that impaired social functioning during the prodrome has an adverse effect on treatment-seeking behaviors due to deficits in communicative and interpersonal abilities.

Surprisingly, only 14.5% of patients had sought professional help during the prodromal period, though this finding was consistent with an earlier report on pathways to care for first-episode psychosis from the same setting.[32] It would have been interesting to compare the present findings to those of prior research on early care during the prodromal period in other samples predominantly consisting of African Americans; however, such studies are presently lacking. Delays in obtaining appropriate treatment in the early course of psychotic illnesses occur both between the onset of illness and first help contact[45] and between the first help contact and successful initiation of treatment,[46] and future research on pathways to care should address help-seeking contacts during the prodromal period as well as during the initial period of untreated psychosis. Further research on help-seeking in first-episode psychosis is particularly important in light of reports suggesting that African Americans are less likely to access psychiatric services.[47–49]

Several methodological limitations of the current study should be recognized. First, generalizability of the findings from this sample to dissimilar populations is restricted given the sample's particular demographic characteristics. For example, the public-sector setting in which this study was conducted provides care for a socially disadvantaged, predominantly low-income population, and this group likely experiences difficulties accessing care more than other groups. Yet, the relatively homogeneous sample (hospitalized African American first-episode patients treated in urban, public-sector settings) enhances internal validity of these findings. Generalizability may also be limited, or biases introduced, by the specific inclusion and exclusion criteria of the study. For example, excluding patients who did not receive a clinical diagnosis of nonaffective psychosis may have biased the sample toward a greater severity of psychopathology of first-episode psychosis.

Second, in addition to the recognized limitations of recall bias that complicate the retrospective assessment of the prodromal period (eg, ascribing importance to irrelevant events when describing significant events leading up to a psychotic episode, selective memory, forgetting pertinent information, and recency effects), the fact that patients were not required to be fully recovered from positive symptoms and cognitive impairments to participate in the study may have affected their ability to provide accurate retrospective self-report information. However, as mentioned previously, patients were required to have a MMSE score of ≥ 23, as well as demonstrate their ability to complete the informed consent process, and family members available to participate in the study served as an additional information source regarding symptom onset and the level of severity required to reach the threshold for onset of the prodrome and psychosis. Third, also related to the difficulty of retrospective measurement, although the SOS and the Course of Onset and Relapse Schedule/Topography of Psychotic Episode interview were used to standardize the determination of onset dates, more information is needed on the psychometric properties of these and related instruments.

The results of this study highlight the importance of greater public awareness about the prodrome. In this specific sample, the majority of first-episode patients had experienced police contact and incarceration prior to first hospitalization for psychosis (C. E. Ramsay, MPH, unpublished data, 2010), whereas only a small subgroup had any contact with mental health professionals during the prodromal period. Thus, assuming that these incarcerations occurred in the months to years prior to onset of psychosis (ie, during the prodrome), or during the period of untreated psychosis, educational efforts focused on law enforcement personnel could aid in the earlier identification and treatment of prodromal or psychotic individuals. In particular, liaison programs that link law enforcement agencies with prodromal and first-episode clinics could prove to be highly efficient for channeling patients into early treatment or preventive interventions.

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REFERENCES

1. Tully EM, McGlashan TH. The prodrome. In: Lieberman JA, Stroup TS, Perkins DO, eds. *The American Psychiatric Publishing Textbook of Schizophrenia*. Washington, DC: American Psychiatric Publishing, Inc; 2006:341–352.
2. Yung AR, McGorry PD, McFarlane CA, et al. Monitoring and care of young people at incipient risk of psychosis. *Schizophr Bull*. 1996;22(2):283–303.
3. Compton MT, McGlashan TH, McGorry PD. Toward prevention approaches for schizophrenia: an overview of prodromal states, the duration of untreated psychosis, and early intervention paradigms. *Psychiatr Ann*. 2007;37:340–348.
4. Johnstone EC, Ebmeier KP, Miller P, et al. Predicting schizophrenia: findings from the Edinburgh High-Risk Study. *Br J Psychiatry*. 2005;186(1):18–25.
5. Klosterkötter J, Hellmich M, Steinmeyer EM, et al. Diagnosing schizophrenia in the initial prodromal phase. *Arch Gen Psychiatry*. 2001;58(2):158–164.

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6. Mason O, Startup M, Halpin S, et al. Risk factors for transition to first episode psychosis among individuals with 'at-risk mental states.' *Schizophr Res*. 2004;71(2-3):227–237.
7. Yung AR, McGorry PD. The initial prodrome in psychosis: descriptive and qualitative aspects. *Aust N Z J Psychiatry*. 1996;30(5):587–599.
8. Yung AR, Phillips LJ, Yuen HP, et al. Psychosis prediction: 12-month follow up of a high-risk ("prodromal") group. *Schizophr Res*. 2003;60(1): 21–32.
9. Yung AR, Yuen HP, McGorry PD, et al. Mapping the onset of psychosis: the comprehensive assessment of at-risk mental states. *Aust N Z J Psychiatry*. 2005;39(11–12):964–971.
10. Yung AR, Stanford C, Cosgrave E, et al. Testing the ultra high risk (prodromal) criteria for the prediction of psychosis in a clinical sample of young people. *Schizophr Res*. 2006;84(1):57–66.
11. Häfner H, Maurer K. The prodromal phase of psychosis. In: Miller T, Mednick SA, McGlashan TH, et al, eds. *Early Intervention in Psychotic Disorders*. Amsterdam: Kluwer Academic; 2001:71–100.
12. McGorry PD, Singh BS. Schizophrenia: risk and possibility. In: Raphael B, Burrows GD, eds. *Handbook of Studies on Preventive Psychiatry*. Amsterdam: Elsevier; 1995:492–514.
13. Yung AR. Identification and treatment of the prodromal phase of psychotic disorders: perspectives from the PACE clinic. *Early Interv Psychiatry*. 2007;1(3):224–235.
14. White T, Anjum A, Schulz SC. The schizophrenia prodrome. *Am J Psychiatry*. 2006;163(3):376–380.
15. Hawkins KA, McGlashan TH, Quinlan D, et al. Factorial structure of the Scale of Prodromal Symptoms. *Schizophr Res*. 2004;68(2–3):339–347.
16. Miller TJ, McGlashan TH, Rosen JL, et al. Prodromal assessment with the structured interview for prodromal syndromes and the scale of prodromal symptoms: predictive validity, interrater reliability, and training to reliability. *Schizophr Bull*. 2003;29(4):703–715.
17. Yung AR, Phillips LJ, McGorry PD, et al. Prediction of psychosis: a step towards indicated prevention of schizophrenia. *Br J Psychiatry suppl*. 1998;172(33):14–20.
18. Cornblatt B, Lencz T, Obuchowski M. The schizophrenia prodrome: treatment and high-risk perspectives. *Schizophr Res*. 2002;54(1–2): 177–186.
19. Cornblatt BA, Auther AM. Treating early psychosis: who, what, and when? *Dialogues Clin Neurosci*. 2005;7(1):39–49.
20. Dworkin RH, Lewis JA, Cornblatt BA, et al. Social competence deficits in adolescents at risk for schizophrenia. *J Nerv Ment Dis*. 1994;182(2): 103–108.
21. Häfner H, Löffler W, Maurer K, et al. Depression, negative symptoms, social stagnation and social decline in the early course of schizophrenia. *Acta Psychiatr Scand*. 1999;100(2):105–118.
22. Niendam TA, Bearden CE, Zinberg J, et al. The course of neurocognition and social functioning in individuals at ultra high risk for psychosis. *Schizophr Bull*. 2007;33(3):772–781.
23. Yung AR, McGorry PD. The prodromal phase of first-episode psychosis: past and current conceptualizations. *Schizophr Bull*. 1996;22(2):353–370.
24. Compton MT, Goulding SM, Broussard B, et al. Treatment delay in the early course of schizophrenia and the duration of untreated psychosis. *Psychiatr Ann*. 2008;38(8):504–511.
25. Niendam TA, Bearden CE, Johnson JK, et al. Neurocognitive performance and functional disability in the psychosis prodrome. *Schizophr Res*. 2006;84(1):100–111.
26. Preda A, Miller TJ, Rosen JL, et al. Treatment histories of patients with a syndrome putatively prodromal to schizophrenia. *Psychiatr Serv*. 2002; 53(3):342–344.
27. Burnett R, Mallett R, Bhugra D, et al. The first contact of patients with schizophrenia with psychiatric services: social factors and pathways to care in a multi-ethnic population. *Psychol Med*. 1999;29(2):475–483.
28. Commander MJ, Cochrane R, Sashidharan SP, et al. Mental health care for Asian, black and white patients with non-affective psychoses: pathways to the psychiatric hospital, in-patient and after-care. *Soc Psychiatry Psychiatr Epidemiol*. 1999;34(9):484–491.
29. Morgan C, Mallett R, Hutchinson G, et al. Negative pathways to psychiatric care and ethnicity: the bridge between social science and psychiatry. *Soc Sci Med*. 2004;58(4):739–752.
30. Morgan C, Mallett R, Hutchinson G, et al. ÆSOP Study Group. Pathways to care and ethnicity. 1: Sample characteristics and compulsory admission. Report from the ÆSOP study. *Br J Psychiatry*. 2005a;186(4):281–289.
31. Morgan C, Mallett R, Hutchinson G, et al. ÆSOP Study Group. Pathways to care and ethnicity. 2: Source of referral and help-seeking. Report from the ÆSOP study. *Br J Psychiatry*. 2005b;186(4):290–296.
32. Compton MT, Esterberg ML, Druss BG, et al. A descriptive study of pathways to care among hospitalized urban African American first-episode schizophrenia-spectrum patients. *Soc Psychiatry Psychiatr Epidemiol*. 2006; 41(7):566–573.
33. Merritt-Davis OB, Keshavan MS. Pathways to care for African Americans with early psychosis. *Psychiatr Serv*. 2006;57(7):1043–1044.
34. Cockrell JR, Folstein MF. Mini-Mental State Examination (MMSE). *Psychopharmacol Bull*. 1988;24(4):689–692.
35. Folstein MF, Folstein SE, McHugh PR, et al. *Mini-Mental State Examination: User's Guide*. Odessa, Florida: Psychological Assessment Resources, Inc; 2001.
36. First MB, Spitzer RL, Gibbon M, et al. *Structured Clinical Interview for DSM-IV Axis I Disorders*. New York, NY: New York State Psychiatric Institute, Biometrics Research Department; 1998.
37. Kay SR, Fiszbein A, Opler LA. The Positive and Negative Syndrome Scale (PANSS) for schizophrenia. *Schizophr Bull*. 1987;13(2):261–276.
38. Compton MT, Chien VH, Leiner AS, et al. Mode of onset of psychosis and family involvement in help-seeking as determinants of duration of untreated psychosis. *Soc Psychiatry Psychiatr Epidemiol*. 2008;43(12):975–982.
39. Perkins DO, Leserman J, Jarskog LF, et al. Characterizing and dating the onset of symptoms in psychotic illness: the Symptom Onset in Schizophrenia (SOS) inventory. *Schizophr Res*. 2000;44(1):1–10.
40. Norman RM, Malla AK, Verdi MB, et al. Understanding delay in treatment for first-episode psychosis. *Psychol Med*. 2004;34(2):255–266.
41. Keshavan MS, Haas G, Miewald J, et al. Prolonged untreated illness duration from prodromal onset predicts outcome in first episode psychoses. *Schizophr Bull*. 2003;29(4):757–769.
42. Birchwood M, Smith J, Cochrane R, et al. The Social Functioning Scale: the development and validation of a new scale of social adjustment for use in family intervention programmes with schizophrenic patients. *Br J Psychiatry*. 1990;157(6):853–859.
43. Goulding SM, Chien VH, Compton MT. Prevalence and correlates of school drop-out prior to initial treatment of nonaffective psychosis: further evidence suggesting a need for supported education. *Schizophr Res*. 2010;116(2-3):228–233.
44. Cornblatt BA, Auther AM, Niendam T, et al. Preliminary findings for two new measures of social and role functioning in the prodromal phase of schizophrenia. *Schizophr Bull*. 2007;33(3):688–702.
45. Addington J, Van Mastrigt S, Hutchinson J, et al. Pathways to care: help seeking behaviour in first episode psychosis. *Acta Psychiatr Scand*. 2002;106(5):358–364.
46. Johannessen JO, Larsen TK, McGlashan TH. Duration of untreated psychosis (DUP): an important target for intervention in schizophrenia? *Nord J Psychiatry*. 1999;53(4):275–283.
47. McMiller WP, Weisz JR. Help-seeking preceding mental health clinic intake among African-American, Latino, and Caucasian youths. *J Am Acad Child Adolesc Psychiatry*. 1996;35(8):1086–1094.
48. Snowden LR. Barriers to effective mental health services for African Americans. *Ment Health Serv Res*. 2001;3(4):181–187.
49. Wells K, Klap R, Koike A, et al. Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. *Am J Psychiatry*. 2001;158(12): 2027–2032.