Prevalence, Factorial Structure, and Clinical Correlates of First Rank Symptoms in Urban, African-American Patients with First-Episode Nonaffective Psychosis

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Abstract

Rationale: Given the dearth of research on the prevalence and clinical correlates of first rank symptoms in first-episode psychosis samples, this study focused on a relatively homogenous sample of hospitalized, first-episode, urban, African-American patients. **Objective:** To determine frequencies of eleven first rank symptoms based on previously published definitions, to conduct correlations and an exploratory factor analysis to reveal any potential latent structure of the eleven symptoms, and to assess associations between first rank symptoms and several select clinical variables. **Methods:** The sample included seventy-three African-American patients hospitalized for a first episode of nonaffective psychosis. A structured inventory was used to rate the presence of first rank symptoms. Additionally, positive, negative, and general psychopathology symptoms were assessed; duration of the prodrome and duration of untreated psychosis were estimated; and depression, insight, and social functioning were rated. **Results:** First rank symptoms were relatively common in this sample—56.2% experienced at least one first rank symptom. Two latent factors were suggested by the factor analysis: one related to Schneiderian hallucinatory experiences and passivity phenomena, and another comprised of the three items on thought control (thought broadcasting, thought withdrawal, and thought insertion). The presence of hallucinatory/passivity first rank symptoms was associated with less impairment in insight, the latter being measured both by patient self-report and researcher ratings. **Conclusions:** In light of these findings from an urban, African-American sample of first-episode patients, additional research on first rank symptoms, especially in terms of factorial structure and clinical correlates, is warranted.

Key Words: First Episode, First Rank, Psychosis, Schizophrenia, Schneiderian Symptoms

Introduction

Kurt Schneider (1) attempted to clarify the diagnosis of schizophrenia by identifying symptoms that are easily perceived by a clinician, agreed upon by observers, and occur only in the context of schizophrenia. Schneider considered these symptoms to be nearly pathognomonic, referring to them as *first rank symptoms*. Although developed based on Schneider's clinical experience rather than theory or formal empirical research (2), first rank symptoms have influenced criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)* (3) and the *International Classification of Diseases, Tenth Edition (ICD-10)* (4).

Empirical studies on the prevalence of first rank symptoms in schizophrenia have yielded variable results. For example, studies utilizing chart reviews to determine rates of first rank symptoms report prevalences ranging from approximately one-third (5) to two-thirds (6) or more (e.g., 88%) (7). Interviewing patients with a checklist of the

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specific symptoms yields prevalence estimates ranging from about one-half of patients (8, 9) to approximately three-fourths (2, 10). The largest prevalence study interviewed 811 patients with a symptom checklist and reported a rate of first rank symptoms in patients with schizophrenia of 57% (11).

Very little research is available on first rank symptoms in first-episode psychosis. González-Pinto and colleagues (12) found that two-thirds of first-episode patients endorsed at least one first rank symptom and 70% of those endorsed at least two symptoms. Tanenberg-Karant and coworkers (13) found the prevalence of first rank symptoms to be 70% among first-episode patient when interviewers used the Structured Clinical Interview for DSM-IV Axis I Disorders (14), which inquires on nine such symptoms.

National, cultural, and ethnic variation in the prevalence of first rank symptoms was widely investigated in the 1970s (5, 11, 15-17) and 1980s (18-22). Two large (n>800) international studies in the mid-1970s yielded prevalence rates of approximately 50% (11, 23); however, rates of first rank symptoms varied substantially between countries despite identical methods of data collection. Interest in national, cultural, and ethnic variation in first rank symptoms has apparently dwindled since the 1980s, with fewer recent reports on culture/ethnicity and first rank symptoms (24-26).

Two studies have been conducted to determine if greater frequency or severity of first rank symptoms in African-American patients account for a greater proportion of African Americans receiving a diagnosis of schizophrenia compared to Caucasians. Arnold and associates (25) used blinded raters to compare African Americans and European Americans with various psychotic disorders on first rank symptoms with the Scale for the Assessment of Positive Symptoms (SAPS) (27). African Americans were found to have more severe first rank symptoms than European Americans, and African-American men were more likely to experience any first rank symptom than other patients. Strakowski and colleagues (28), utilizing data from the DSM-IV Field Trial for Schizophrenia and Other Psychotic Disorders, rated the frequency and severity of seven first rank symptoms. African-American patients with a psychotic disorder were rated as generally having more severe psychotic symptoms, and specifically having more severe first rank symptoms than Caucasian patients. Both studies suggested that higher rates of psychotic diagnoses may be due in part to more severe ratings of first rank symptoms in some African-American patients. However, Tanenberg-Karant and coworkers (13) found that ethnicity was not related to the presence of first rank symptoms among a sample of ninety-four first-episode patients. To date, no study has specifically reported rates of all eleven first rank symptoms defined in detail by Mellor (2) among African-American first-episode patients.

Several clinical variables may be associated with a greater likelihood of first rank symptoms in patients with schizophrenia, including: left-handedness (29), earlier age at onset (12), language deficits (30, 31), and poorer functioning (13). However, in the context of first-episode psychosis, there is very little information available on associations between demographic and clinical variables and first rank symptoms.

Given the relative dearth of reports on the prevalence and clinical correlates of first rank symptoms in first-episode samples, especially among African Americans, and in light of evidence that the prevalence of first rank symptoms may vary substantially by culture/race/ethnicity, this study focused on a relatively homogenous sample of hospitalized, urban, first-episode, African-American patients. This analysis had a three-fold objective. First, the frequencies of eleven first rank symptoms were determined using previously published definitions (2). Second, correlations and an exploratory factor analysis were conducted to reveal any potential latent structure of the eleven symptoms. Third, associations between the presence of first rank symptoms and several select clinical variables were assessed, including: positive symptoms, negative symptoms, general psychopathology symptoms, duration of the prodrome, duration of untreated psychosis (DUP), depression, insight, and social functioning. As an exploratory analysis, these same clinical variables were examined in relation to latent dimensions, or subscales, of first rank symptoms uncovered in the exploratory factor analysis. Although attempts to elucidate the symptomatology of schizophrenia have generally moved beyond Schneiderian first rank symptoms (and substantial research has investigated three- and five-factor domains of symptoms), the current study assessed frequencies, correlations, factorial structure, and clinical correlates of first rank symptoms specifically because little research has characterized first rank symptoms in this way, beyond simply reporting frequencies. Additionally, because phase of illness, chronicity, and antipsychotic treatment may affect symptom structure (32), a relatively homogeneous group of first-episode patients was studied. Recent research has called into question the specificity and diagnostic value of first rank symptoms (33, 34), and the aim of the current study was to describe and explore first rank symptoms in this sample, without attempts to evaluate validity, specificity, predictive value, or clinical usefulness of these symptoms.

Methods

Setting and Sample

Participants were hospitalized in one of three psychiatric units: 1) the crisis stabilization unit of a large, urban, public sector hospital, which has a typical length of stay of five to seven days (n=13); 2) the extended-stay inpatient unit of this

same hospital, where patients usually stay seven to fourteen days, or longer if needed for stabilization (n=53); and, 3) a county psychiatric crisis center in an adjacent urban county, which has an average length of stay of approximately seven days (n=7). All three inpatient units care for patients who have public-sector insurance (e.g., Medicaid) or no health insurance. The population served by these public-sector units is comprised predominantly, though not exclusively, of low-income, urban, African Americans.

The sample included seventy-three African-American participants (fifty-six males and seventeen females) who were hospitalized for a first episode of nonaffective psychosis. All patients were admitted between July 2004 and September 2007, and were recruited as part of an ongoing study of determinants of treatment delay and DUP. Exclusion criteria included: 1) age younger than 18 years or older than 40 years; 2) inability to speak English; 3) known mental retardation; 4) Mini-Mental State Examination (35, 36) score of <23; 5) the presence of a significant medical condition that could compromise ability to participate in the evaluation; and, 6) inability to give informed consent for any reason. Additionally, though some patients had previous outpatient treatment contacts, two other exclusion criteria were: 7) prior outpatient antipsychotic treatment lasting less than three months; and, 8) any prior hospitalization for psychosis that occurred more than three months before the current admission.

Procedures

Patients underwent a clinical research assessment as part of the larger project. All evaluations were conducted during hospitalization, after acute psychosis was stabilized sufficiently to allow for informed consent and research participation. The research was approved by all relevant institutional review boards. The following constructs were assessed.

Clinical Diagnoses

Nonaffective primary psychotic disorders were diagnosed using the appropriate modules of the SCID-I (14). The test-retest reliability of the SCID-I for *DSM-III-R* Axis I diagnoses has been determined in a variety of nations and populations, and the overall weighted kappa has been reported to be 0.61 in patient samples (37). In the present study, clinician-researchers administering the SCID-I were trained and received supervision by the lead investigator. All available sources of information about the patient were used, including the patient interview, data gleaned from a chart review, and informant/family member collateral information when available. Other clinical data were collected, including: mode of onset of psychosis, who had brought the patient to the hospital, the presence of alcohol or cannabis-use disorders based on SCID-I criteria, voluntary versus involuntary hospital admission, and hospital length of stay.

First Rank Symptoms

First rank symptoms were rated using an inventory based on detailed definitions provided by Mellor (2). This inventory assessed for the presence of the eleven hallucinatory and delusional experiences. The internal consistency reliability coefficient for the eleven-item instrument in this sample was α=0.76.

Symptoms of Schizophrenia

Severity of symptoms of schizophrenia-spectrum illnesses was determined with the widely used Positive and Negative Syndrome Scale (PANSS) (38). The PANSS is a thirty-item scale that uses a seven-point rating scheme, and is completed by clinically trained research staff at the conclusion of a chart review and a semistructured interview that focuses on patients' reports of recent symptoms. Items are grouped into three categories: positive symptoms (seven items), negative symptoms (seven items), and general psychopathology symptoms (sixteen items), such as anxiety and depression. Good internal consistency of the three subscales has been demonstrated in several studies, and research comparing the subscales with similar symptom measures has consistently demonstrated good concurrent validity (37). Several studies of the PANSS have provided evidence of criterion-related and predictive validity (38).

Duration of the Prodrome and DUP

These two preadmission durations were estimated using information from the Symptom Onset in Schizophrenia inventory (SOS) (39) and the Course of Onset and Relapse Schedule/ Topography of Psychotic Episode (CORS/TOPE) (40). Duration of the prodrome was defined as the number of weeks from the onset of illness/prodromal symptoms until the onset of psychosis. The first prodromal symptoms of the illness that were contiguous (without clearly discernible periods of wellness intervening) with subsequent onset of psychosis (41) were used to operationalize the dating of the onset of the prodrome, following the scoring instructions of the SOS. Select items from the semistructured CORS/TOPE also were used to probe for information related to early-course characteristics and dating of the onset of the prodrome and onset of psychosis. The DUP was considered to be the number of weeks from the onset of positive psychotic symptoms until first hospital admission, based on previously reported operationalizations (42).

Depressive Symptoms

Depressive symptomatology was rated using the Calgary Depression Scale for Schizophrenia (CDSS) (43) and the depression item from the PANSS (38). The CDSS is a reliable,

sensitive, and valid questionnaire designed specifically to measure depression in patients with schizophrenia (43). Composed of nine items defined according to operational criteria and rated on a four-point scale ranging from 0 (absent) to 3 (severe), total scores >6 suggest the presence of a major depressive episode. The internal consistency reliability value for the nine-item CDSS in the present sample was α=0.80. The depression item from the PANSS is rated on a seven-point scale of severity ranging from 1 to 7 based on descriptive anchors that draw upon the self-report of depressed mood by the individual and observation of its influence on his or her attitude and behavior during the interview. Higher scores indicate greater severity of depression. In the present sample, the correlation between the CDSS and the PANSS depression item was ρ=0.75, p<0.001.

Insight

Insight was measured using the Birchwood Insight Scale (BIS) (44) and the insight/judgment item from the PANSS (38). The BIS is a widely used, eight-item self-report measure of insight. Each item is a statement to which the participant responds "agree," "disagree," or "unsure." Items are summed to determine a total score, with a higher score indicating greater insight. Satisfactory internal consistency (α=0.75) and test-retest reliability (r=0.90) have been reported, and construct and concurrent validity have been demonstrated (44). The internal consistency for the BIS in the present sample was α=0.81. Scores on the insight item from the PANSS range from 1 to 7 with lower scores indicating greater insight. According to the PANSS, a lack of judgment and insight is defined as an impaired awareness or understanding of one's own psychiatric condition and life situation. This is evidenced by a failure to recognize past or present psychiatric illness or symptoms, denial of a need for psychiatric hospitalization, or treatment decisions characterized by poor anticipation of consequences, as well as unrealistic short-term and long-range planning. This item has been used extensively as a measure of insight in patients with psychosis (45-48). In the present sample, the correlation between the BIS and the PANSS insight/judgment item was ρ=-0.62 (p<0.001). That is, poorer insight is indexed by lower scores on the BIS and higher scores on the PANSS.

Social Functioning

Social functioning prior to hospitalization was rated using the Social Functioning Scale (SFS) (49) and the Social and Occupational Functioning Assessment Scale (SOFAS) (50). The SFS is a reliable and valid seventy-one-item questionnaire developed to assess the social behaviors and functioning of individuals with schizophrenia in community settings. Inquiring about abilities and performance in seven areas (social engagement/withdrawal, interpersonal behavior, independence–performance, recreation, prosocial, independence–competence, and employment/occupation), each item is rated on a four-point scale of frequency or ability. Higher scores indicate a higher frequency or competency. Subscale scores are the sum of items in each area and the total score is the sum of all items. The SOFAS is a reliable and valid instrument used to measure social functioning along a one-hundred-point continuum divided into ten-point intervals relying on descriptive anchors. The higher the score, the more competent the individual is with regard to social functioning. The SOFAS assesses social and occupational functioning in a manner that is not directly influenced by severity of psychiatric symptoms, while taking into consideration the effects of general medical conditions (37, 51, 52). The correlation between the SFS total score and the SOFAS score was ρ=0.31 (p=0.02).

Data Analysis

Distributional properties and basic descriptive statistics for the variables of interest were assessed. Frequencies of the eleven first rank symptoms were calculated. Intercorrelations among the various first rank symptoms were examined using the phi correlation. For the exploratory factor analysis, extraction was conducted using the principal axis factoring method, followed by an orthogonal (varimax) rotation. This rotational procedure provides a simpler and more easily interpreted solution than is possible from the principal (unrotated) components, by reducing the number of factors on which the variables have high loadings. Items with factor loadings ≥.30 on these components were deemed meaningful, and only the highest factor loading for each item was considered. Subscale scores were computed by summing the appropriate items, and correlations between the derived factors were assessed. Associations between the presence of first rank symptoms and the select clinical variables were assessed using independent samples Student's t-tests and Mann-Whitney U tests depending on the distributional properties of the dependent variable. Similar tests were conducted to explore these same clinical variables in relation to the latent dimensions of first rank symptoms revealed in the exploratory factor analysis. All analyses were conducted using the SPSS 14.0 statistical software package.

Results

Sociodemographic and Clinical Characteristics

Sociodemographic characteristics of the sample (n=73) are shown in Table 1. The mean age was 23.3±5.0 years (range: 18–39 years), and 56 (76.7%) of the patients were men. Nearly half of the sample (32, 43.8%) had not graduated from high school, despite the fact that all patients

Table 1 Sociodemographic Characteristics of Hospitalized African-American Patients with a First Episode of Nonaffective Psychosis (n=73)

Age, years (SD)	23.3±5.0
Gender, male	56 (76.7%)
Level of educational attainment:	
Did not graduate high school	32 (43.8%)
High school graduate	15 (20.5%)
Trade or vocational school	5 (6.8%)
Some college	12 (16.4%)
College graduate	9 (12.4%)
Marital status:	
Single and never married	67 (91.8%)
Married or living with a partner	3 (4.1%)
Divorced	3 (4.1%)
Employed during the month prior to hospitalization	28 (38.4%)
Who the patient lived with prior to admission:	
Alone	6 (8.2%)
With family members	49 (67.1%)
With boyfriend/girlfriend, partner, or spouse	4 (5.5%)
With friends	3 (4.1%)
Homeless	3 (4.1%)
Other	8 (11.0%)
Ever incarcerated	46 (63.0%)

SD=standard deviation

were ≥18 years of age. Almost all of the participants (67, 91.8%) were single and never married, only 28 (38.4%) had been employed during the month prior to hospitalization, and 49 (67.1%) had been living with family members prior to admission. Alarmingly, the majority of the sample (46, 63.0%) had been incarcerated at least once.

Basic clinical characteristics are provided in Table 2. The modal diagnosis was schizophrenia, paranoid type (32, 43.8%), followed by schizophreniform disorder (18, 24.7%), other schizophrenia subtypes (10, 13.7%), schizoaffective disorders (6, 8.2%), and psychotic disorder not otherwise specified (7, 9.6%). Nearly three-quarters of the patients (53, 73.7%) had experienced an acute or subacute onset of psychotic symptoms. Whereas 27 patients (37.0%) were brought to the hospital by family members or friends, 23 (31.5%) were brought to the hospital by police officers. Based on the SCID-I, alcohol abuse or dependence was present in 12 patients (16.4%) and cannabis abuse or dependence was present in 33 (45.2%). Most participants (61, 83.6%) were admitted to the hospital involuntarily, and the average length of stay was 12.1±5.6 days (range: 2–27 days).

Frequencies of First Rank Symptoms and Intercorrelations

Frequencies of the eleven first rank symptoms are shown in Table 3. The most commonly endorsed symptoms were: voices commenting on one's actions (19, 26.0%), diffusion or broadcasting of thoughts (18, 24.7%), and thought withdrawal (14, 19.2%). As shown in Table 4, nearly half of the sample (32, 43.8%) endorsed no first rank symptoms, 12 patients (16.4%) endorsed one first rank symptom, 8 (11.0%) endorsed two first rank symptoms, and 21 (28.7%) endorsed three or more first rank symptoms.

Significant correlations between the eleven first rank symptoms are given in Table 5. In general, item-item correlations were modest to moderate. The highest correlations were found between thought withdrawal and thought insertion (r=0.63), audible thoughts and voices commenting on one's actions (r=0.54), thought withdrawal and diffusion or broadcasting of thoughts (r=0.53), made impulses/drives and voices commenting on one's actions (r=0.44), made volitional acts and made

Table 2 Basic Clinical Characteristics of Hospitalized African-American Patients with a First Episode of Nonaffective Psychosis (n=73)

Diagnosis:	
Schizophreniform disorder	18 (24.7%)
Schizophrenia, paranoid type	32 (43.8%)
Schizophrenia, disorganized type	7 (9.6%)
Schizophrenia, residual type	2 (2.7%)
Schizophrenia, undifferentiated type	1 (1.4%)
Schizoaffective disorder, bipolar type	3 (4.1%)
Schizoaffective disorder, depressive type	3 (4.1%)
Psychotic disorder not otherwise specified	7 (9.6%)
Mode of onset of psychotic symptoms (n=72):	
Acute (<1 week)	23 (32.0%)
Subacute (1 week to 1 month)	30 (41.7%)
Chronic (>1 month)	19 (26.4%)
Who brought the patient to the hospital:	
Self	2 (2.7%)
Family members or friends	27 (37.0%)
Emergency medical services/ambulance	7 (9.6%)
Mobile crisis unit	4 (5.5%)
Police	23 (31.5%)
Court-issued order to apprehend	2 (2.7%)
Other	8 (11.1%)
Presence of alcohol abuse or dependence	12 (16.4%)
Presence of cannabis abuse or dependence	33 (45.2%)
Involuntarily admitted to the hospital	61 (83.6%)
Hospital length of stay, days (SD)	12.1±5.6

SD=standard deviation

Table 3 Prevalence of Specific First Rank Symptoms among Hospitalized African- American Patients with a First Episode of Nonaffective Psychosis (n=73), Listed by Order of Frequency

Voices commenting on one's actions	19 (26.0%)
Diffusion or broadcasting of thoughts	18 (24.7%)
Thought withdrawal	14 (19.2%)
Thought insertion/thoughts ascribed to others	12 (16.4%)
Audible thoughts	11 (15.1%)
Delusional perception	11 (15.1%)
Voices arguing	9 (12.3%)
"Made" impulses/drives	9 (12.3%)
Somatic passivity/influence playing on the body	8 (11.0%)
"Made" volitional acts	7 (9.6%)
"Made" feelings	5 (6.8%)

Table 4 Number of First Rank Symptoms Endorsed

0	32 (43.8%)
1	12 (16.4%)
2	8 (11.0%)
3	6 (8.2%)
4	6 (8.2%)
5	3 (4.1%)
6	4 (5.5%)
7	2 (2.7%)

impulses/drives (r=0.44), and thought insertion and diffusion or broadcasting of thoughts (r=0.43). All other correlations were <0.40, though in general, the results suggested that the correlation matrix was factorable given that numerous pairs were significantly correlated.

Exploratory Factor Analysis

Exploratory factor analysis was conducted based on these correlational results. The initial principal component analysis yielded five factors with eigenvalues >1.0, accounting for 73.9% of the variance. The Kaiser-Meyer-Olkin measure of sampling adequacy (which ranges from 0 to 1, with values of >0.6 being recommended) was 0.64. The number of factors relevant for further consideration was determined by examining initial eigenvalues, the cumulative proportion of variance explained, and by visual inspection of the scree plot (which plots ordered eigenvalues against factors). This assessment suggested the importance of the first two factors (with initial eigenvalues of 3.2 and 1.6). The factor analysis was then limited to these two factors, which alone accounted for 43.4% of the total variance. Initial extraction communalities (which represent the proportion of variance in the item accounted for by the factors) of the eleven items ranged from 0.17 for delusional perception to 0.54 for thought withdrawal. The factor solution, after varimax rotation, revealed the factor loadings (i.e., the correlation coefficients between the items and the factors) shown in Table 6, 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 here is referred to as the "hallucinations/passivity" factor, included seven items: voices commenting on one's actions, audible thoughts, voices arguing, made impulses, somatic passivity, made volitional acts, and made feelings. The second factor, called the "thought control" factor, included three items: thought broadcasting, thought withdrawal, and thought insertion. Cronbach's alpha internal consistency coefficients for these two factors were 0.69 and 0.81, respectively, indicating an acceptable level of internal consistency. The correlation between the two factors was 0.41, which suggests that the factor analysis resulted in two moderately correlated subscales.

Associations between First Rank Symptoms and Clinical Variables

There were no associations between the presence of first rank symptoms and age or gender. As shown in Table 7, the thirty-two participants without first rank symptoms did not differ from the forty-one with first rank symptoms with regard to PANSS subscale scores, duration of the prodrome, DUP, depression scores, or social functioning scores. However, patients with first rank symptoms had a significantly lower median score on the PANSS impaired insight item compared to those without first rank symptoms (indicating that the presence of first rank symptoms is associated with better insight: z=2.47, p=0.01). Similarly, patients with first rank symptoms had a numerically higher mean BIS total score than those without first rank symptoms, and this difference approached statistical significance (t[71]=1.80, p=0.08).

Relationships between latent dimensions of first rank symptoms and clinical variables were investigated as an exploratory analysis. First, based on findings from the above factor analysis, patients with and without first rank symptoms from the "hallucinations/passivity" domain were compared on clinical variables. The twenty-nine patients with "hallucinatory/passivity" first rank symptoms had a higher mean BIS score (7.0±3.2) than the forty-three without these symptoms (4.9±3.2; t[70]=2.73, p=0.008). As well, the patients with "hallucinatory/passivity" symptoms had a lower median PANSS impaired insight item score (4.0) than those without these symptoms (6.0; z=3.44, p=0.001). Second, patients with and without first rank symptoms from the "thought control" domain were compared. The twenty-

Table 5 Correlations between First Rank Symptoms (only significant correlations are shown, p<.05.)

	1	2	3	4	5	6	7	8	9	10	11
1. Voices commenting on one's actions											
2. Diffusion or broadcasting of thoughts	.24										
3. Thought withdrawal		.53									
4. Thought insertion/thoughts ascribed to others	.24	.43	.63								
5. Audible thoughts	.54										
6. Delusional perception											
7. Voices arguing	.35		.24								
8. "Made" impulses/drives	.44			.28	.31						
9. Somatic passivity/influence playing on the body							.27				
10. "Made" volitional acts	.23							.44	.33		
11. "Made" feelings	.33			.32	.34			.39	.25		

four patients with first rank "thought control" symptoms had a higher mean PANSS positive symptom score (25.7±4.2) than the forty-nine without these symptoms (22.8±4.4; t=2.74, df=71, p=0.008).

Discussion

In light of the relative dearth of research on first rank symptoms in the context of first-episode psychosis, especially among African-American patients, several interesting findings emerged from this cross-sectional, descriptive study. First, first rank symptoms are relatively common in this population. For example, over half of participants experienced at least one first rank symptom, and over one-quarter endorsed the presence of auditory hallucinations in which voices were commenting on one's actions (the most common first rank symptom in this sample). The former finding is remarkably similar to the median rate of 51 to 52% across ten studies of patients with schizophrenia reviewed by Tanenberg-Karant and associates (13). It is also similar to other samples of patients with psychosis in the United States (8, 9), but it is somewhat less than the rate of 70% reported by Tanenberg-Karant and associates (13) among first-episode American patients with nonaffective psychosis. The reason for the apparent difference between the rate in the current sample (56.2%) and this rate of 70% is unclear, but may be due to methodological differences. Whereas Tanenberg-Karant and associates (13) assessed nine first rank symptoms with the SCID-I, interviewers in the current study rated eleven first rank symptoms using a structured inventory. Alternatively, the prevalence of first rank symptoms may be lesser in African-American samples compared to broader American samples. However, research by Arnold and colleagues (25) suggests that African-American men, who comprised 77% of the current sample, are more likely than other groups to experience any first rank symptoms, at least when assessed using the SAPS. Given findings that there may be substantial cross-cultural differences in symptom expression in schizophrenia (53, 54), further research in this area is needed to establish more reliable prevalence estimates of first rank symptoms in first-episode African-American samples.

Second, the current study was one of few to investigate the latent structure of first rank symptoms. The factor analysis suggested a two-factor solution with the first factor related to Schneiderian hallucinatory experiences and passivity phenomena, and the second factor comprised of the three items pertaining to thought control. The delusional

Table 6 Rotated Factor Loadings for the 11 First Rank Symptoms (only factor loadings ≥.30 are shown.)

Item	Factor 1 "Hallucinations/ Passivity"	Factor 2 "Thought Control"
Voices commenting on one's actions	.69	
Diffusion or broadcasting of thoughts		.59
Thought withdrawal		.86
Thought insertion/thoughts ascribed to others		.64
Audible thoughts	.52	
Delusional perception*		
Voices arguing	.31	
"Made" impulses/drives	.63	
Somatic passivity/influence playing on the body	.34	
"Made" volitional acts	.48	
"Made" feelings	.60	

* This item did not load onto either factor.

perception item (defined by Mellor [2] as "a delusion that arises from a perception which to the patient possesses all the properties of a normal perception, and which he/she acknowledges would be regarded as such by anyone else; however, the perception has a private meaning for him/her, and a delusional system follows") did not load substantially onto either of these factors. Because of the facts that the first rank symptom concept has uncertain validity, that far from all patients have any first rank symptoms, and that there are only eleven symptoms, it could be questioned as to whether or not further subdivision is justified. However, the present findings resemble those of Peralta and Cuesta (33) who reported two factors (that explained 53% of the variance and were moderately correlated, r=0.45), one comprised of the delusional symptoms and the second containing the hallucinatory symptoms, audible thoughts, and delusional perception. Additional research should examine the latent structure of first rank symptoms to determine whether or not consistent subscales are detectable within this ostensibly multidimensional construct. Also, future research using this specific list of eleven items would benefit from confirmatory factor analyses to test the factors found in the present study. If additional research supports the factor structure reported here, there may be value in subdividing first rank symptoms for future studies that examine sociodemographic and clinical correlates of first rank symptoms, as well as the diagnostic significance of these subsets of symptoms.

Third, the presence of hallucinatory/passivity first rank symptoms was associated with less impairment in insight, the latter being measured both by self-report of patients (BIS) and by an objective researcher rating (PANSS insight/judgment item). Although additional research is needed, it could be that patients are more able to recognize the pathological nature of some of these symptoms, such as voices arguing and somatic passivity, as opposed to more mundane auditory hallucinations and other symptom types that are associated with poor insight, such as negative symptoms and disorganization. Additionally, the presence of thought control first rank symptoms was associated with a higher PANSS positive symptom score, which is not surprising. Few studies have examined clinical correlates of the presence of first rank symptoms. Most studies have not found consistent associations between the presence of first rank symptoms and demographic variables, clinical characteristics, or outcomes (13), though a very recent critical review suggested that some first rank symptoms appear to be related to good outcome and some to poor outcome (34). Mellor (2) reported that the mean number of admissions to the hospital was less in patients with schizophrenia and first rank symptoms than in those without. From the results of this study, one could postulate that the presence of hallucinatory/passivity first rank symptoms, and the higher level of insight associated with these symptoms, may lead to a higher level of medication compliance and fewer hospital admissions.

Several methodological limitations of the current study should be recognized. First, the relatively small sample size may have limited the precision of prevalence

Table 7 Comparisons between Patients with and without First Rank Symptoms on Select Clinical Variables (n=73)

Variable	First Rank Symptoms Absent (n=32)	First Rank Symptoms Present (n=41)	Test Statistic (df)	p
PANSS Subscale Scores:				
Positive symptoms	23.6±4.4	23.8±4.7	.22 (71)	.83
Negative symptoms	23.0±6.5	22.1±7.2	.52 (71)	.61
General psychopathology symptoms	41.8±8.4	42.4±9.0	.29 (71)	.77
Duration of prodrome, weeks*	8.71	35.0	1.61	.11
Duration of untreated psychosis, weeks*	26.3	24.3	.00	1.00
Calgary Depression Scale total score	4.1±5.1	4.4±3.3	.32 (69)	.75
PANSS Depression item*	3.0	3.0	1.40	.16
Birchwood Insight Scale total score	4.9±3.3	6.3±3.3	1.80 (71)	.08
PANSS Impaired Insight item*	6.0	4.0	2.47	.01
Social Functioning Scale total score	125.5±28.2	126.7±28.9	.17 (60)	.87
Social and Occupational Functioning Assessment Scale score	38.2±12.6	40.0±10.4	.67 (69)	.50

*Due to non-normal distributions of these variables, the Mann-Whitney U test was used. Medians (rather than mean±SD) are shown, and the Mann-Whitney U z-value is shown as the test statistic.
PANSS=Positive and Negative Syndrome Scale

estimates and clearly restricted the complexity of analyses that could be conducted. However, very few studies are available focusing on first-episode patients, and the investigative team knows of no other research on first rank symptoms specifically involving African-American first-episode patients. Second, the generalizability of findings from this sample to dissimilar populations is limited given the sample's particular characteristics. For example, the sample included hospitalized patients only, and this may imply that only cases with relatively severe psychopathology were analyzed. Additionally, 63% of the sample had been incarcerated at least once, and 84% was admitted involuntarily, further demonstrating the unique features of this particular sample, which limit generalizability. Yet, the relatively homogeneous sample (hospitalized African-American first-episode patients in an urban, public-sector treatment setting) enhances internal validity of the findings. Third, measurement of first rank symptoms was limited by a lack of available scales with proven psychometric properties. However, to enhance validity to the extent possible, detailed definitions provided by Mellor (2) were used in the rating of first rank symptoms. Fourth, in conducting exploratory factor analysis it is suggested that the ratio of participants to variables (test items) be at least 5:1, and the sample size (n=73) used in this study was just above this preferred ratio (6.6:1). Further research on the factorial structure of first rank symptoms would benefit from even larger samples in order to enhance the precision of factor analysis results. Another inherent limitation of this factor analysis is the potential effect of low base rate frequencies of some first rank symptoms (e.g., made volitional acts and made feelings) on the reliability of the factor structure (55).

Although the concept of first rank symptoms is of great interest in relation to the historical evolution of the schizophrenia diagnostic construct, additional modern research on first rank symptoms may be informative. Neuroimaging findings have suggested an association between Schneiderian symptoms and increased regional cerebral blood flow or hyperactivation in the right parietal cortex (56-58) and provide support for the notion that such symptoms are related to an impairment in the mechanisms underlying the recognition of originators of actions (57). This, along with notions that first rank symptoms may be linked to a loss of normal cerebral asymmetry (29), suggests that first rank symptoms may be distal phenotypic markers of key abnormal physiologic processes of psychosis. Given the well-replicated prevalence of first rank symptoms across a number of studies in different settings with various diagnostic distributions and demographic characteristics, Schneiderian symptoms are worthy of further focused research attention.

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