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Medication Compliance in Patients with Chronic Schizophrenia: Implications for the Community Management of Mentally Disordered Offenders

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ABSTRACT: The safe and effective management of mentally disordered offenders is a paramount concern in decisions for community placement. Treatment effectiveness is often vitiated by medication noncompliance. In the current study, clinical and sociodemographic correlates of treatment compliance were examined in outpatients with schizophrenia. Level of medication compliance, assessed independently by treatment staff at two outpatient settings, resulted in 40 compliant, 38 noncompliant, and 12 partially compliant patients. Key symptoms associated with medication noncompliance were anger, delusions, and hallucinations. As an initial investigation, a stepwise discriminant analysis was moderately successful at predicting medication noncompliance. The implications of these findings to mentally disordered offenders are explored.

KEYWORDS: medication noncompliance, treatment compliance, mentally disordered offenders, forensic assessment

A critical challenge to forensic psychiatry and psychology is the effective treatment and safe management of forensic patients within the community. Rice and her colleagues (1) provided systematic data on both inpatient and outpatient treatment of forensic patients: most forensic outpatients warrant the diagnosis of schizophrenia and have had extensive involvement in both the mental health and criminal justice systems. With the emphasis on treatment of mentally disordered offenders in the least restrictive setting (2,3), forensic clinicians must address the twin concerns of safety and treatability in the eventual release of nearly all forensic patients (4).

Forensic outpatients are composed primarily of two distinct groups: chronic patients with minor offenses diverted from the criminal justice system, and mentally disordered offenders with major offenses discharged from correctional mental health and inpatient forensic facilities. With the deinstitutionalization of mentally ill and subsequent cutbacks in community services (5), persons with chronic and severe disorders often remain untreated, become homeless, and subsequently are charged with minor offenses (6). One alternative to the rapid cycling of chronic patients with minor charges through the criminal justice, forensic mental health, and social-services systems is the development of community-based diversion programs (7). Steadman and his colleagues (8) researched eight large diversion programs for mentally disordered offenders that were characterized by integrated services and intensive case management. Moreover, Lamb (9) found that the major predictors of arrest for mentally disordered offenders were noncompliance with antipsychotic medication and substance abuse treatment.

The second source of forensic patients are those charged with major offenses and includes mentally disordered offenders in both forensic hospitals (i.e., insanity acquittees and prison transfers) and inpatient correctional facilities. The overriding issue regarding disposition (e.g., discharge, conditional release, or parole) is dangerousness and the effectiveness of mandated outpatient treatment to reduce the risk of dangerousness (10–12). Pivotal issues in the eventual release of forensic inpatients involve dangerousness and concomitant lack of improvement (13). An important factor contributing to this lack of improvement is noncompliance with treatment, especially medication (14,15).

Data on discharged forensic patients suggest that treatment noncompliance is relatively common and often results in rehospitalizations. Wiederlanders and Choate (16) conducted an elaborate follow-up study of 254 forensic patients. The most common diagnosis was schizophrenia (47.2%) in patients with extended hospital stays ($M = 4.44$ years). They found that treatment noncompliance was the principal cause of rehospitalization. For approximately 12 months, the majority of forensic outpatients (52.4%) had their conditional release revoked largely because of two related issues: noncompliance and decompensation.

The high rate of medication noncompliance in patients with schizophrenia extends beyond forensic facilities to most hospital and community settings. In clinical settings, researchers have assessed various aspects of medication noncompliance, such as sociodemographic variables (17–20), social support (21–24), and side effects of the medication (20,25). Most studies have focused generally on treatment variables (26–30). However, one potential risk factor contributing to medication noncompliance is specific psychotic symptoms associated with the diagnosis of schizophrenia; few studies have investigated systematically the role of psychotic symptoms in medication noncompliance.

Several studies have examined positive symptoms of schizophrenia in relation to medication compliance. Van Putten (31) investigated the drug-taking behavior of 85 patients with schizophrenia over a two-year period and found that 46% of the patients were noncompliant with their medications. In addition, he found that patients with paranoid symptoms were especially intolerant of side effects and, therefore, apt to discontinue their medications. In a more recent study of 42 hospitalized patients with schizophrenia, Pristach and Smith (32) found that the diagnosis of paranoid

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schizophrenia was significantly correlated with medication noncompliance while schizophrenia, NOS, was not. This study has limited generalizability because all patients had a comorbid history of substance abuse.

Studies of medication compliance could be improved methodologically by the implementation of structured interviews (e.g., SADS and SCID) that improve reliability via standardized symptom ratings (33). In the past, most studies addressing symptoms of schizophrenia associated with medication noncompliance investigated these symptoms as secondary analyses and did not assess them systematically. Additionally, previous studies utilized brief standardized questionnaires to assess compliance; these measures allowed researchers to address only general dimensions of disorders instead of specific symptoms associated with each disorder.

The primary purpose of the present study was to investigate systematically key symptoms that differentiated patients with schizophrenia on the issue of medication compliance. The greatest challenge to the study was the accurate assessment of treatment compliance. In forensic settings, admission of medication noncompliance is likely to carry serious consequences (e.g., revocation of conditional release or judicial hearing on probationary status). Therefore, we chose to investigate medication compliance at two nonforensic sites (public hospital and Veterans Administration (VA) center) under the theory that more accurate data collection would be possible when severe sanctions are not likely to be imposed.

Method

Participants

The study was conducted at two hospitals that serve the Dallas/Fort Worth metropolitan area in Texas. The settings included an outpatient partial hospitalization program at John Peter Smith Hospital in Fort Worth and the outpatient Mental Health Clinic at the Dallas Veterans Administration Medical Center. Participants were selected over a one-year period, based on a preliminary diagnosis of schizophrenia according to the DSM-IV (34) rendered by their primary psychiatrists. A second stipulation was that participants had been receiving outpatient care for at least two weeks.

The participant sample is composed of 61 males and 29 females with comparable numbers recruited from John Peter Smith Hospital ($n = 44$) and the Dallas Veterans Administration Medical Center ($n = 46$). A greater proportion of the sample was male, which was anticipated given the low frequency of female patients at the Dallas Veterans Administration Medical Center. The age range of the participants varied considerably (range from 19 to 75; $M = 43.34$, $SD = 12.36$), as did their education level (range from 7 years to 14 or more years, with most of individuals having at least one year of college). The majority of the participants currently were not married (single = 35, married = 16, widowed = 5, separated = 8, and divorced = 26). Racial composition was White ($n = 55$), African American ($n = 33$), and Hispanic American ($n = 2$). Besides their diagnosis of schizophrenia, mood symptoms played a substantial role. With respect to prior diagnoses, 25 (27.8%) participants had warranted the diagnosis of major depression, and 15 (16.7%) had warranted the diagnosis of schizoaffective disorder, according to their chart diagnoses.

Measures

Classification for antipsychotic medication compliance was based on the definitions of compliance described below. Although five participants were administered injections, they also received oral medications. Therefore, ratings of their compliance were based with the oral medications. Patients who insisted on reducing their medication levels but continued to maintain their dosage thereafter were considered compliant.

Participants were placed into one of three groups based on their current outpatient treatment: non-compliant, mixed, and compliant. Operational definitions employed the following criteria:

1. The compliant group consisted of participants who had taken their antipsychotic medication, as prescribed, more than 80% of the time.
2. The noncompliant group consisted of participants who had not taken their antipsychotic medication as prescribed for at least 50% of the time. Gillum and Barsky (35) identified a compliance failure rate of 50% for outpatients as the minimum figure used by the studies surveyed.
3. The mixed group consisted of participants who did not fall into either of the other two categories (had taken their antipsychotic medication as prescribed more than 50% but less than 80% of the time).

The Schedule for Affective Disorders and Schizophrenia or SADS (36) was administered to all participants. The SADS is a semi-structured diagnostic interview that was developed to improve diagnostic reliability and validity. The SADS is especially suited for the current study for two reasons: First, unlike most Axis l interviews, it provides severity ratings of specific symptoms. Second, the inter-rater reliabilities for individual symptoms is exceptionally high (33). The SADS incorporates a progression of questions and criteria used to obtain information for making a diagnosis, and a detailed description of past psychopathology and functioning necessary for an evaluation of diagnosis, prognosis, and overall severity of disturbance (36).

Staff nurses responsible for medication were utilized to make estimates of medication compliance based on their knowledge and interactions with the participants. The staff was employed because of their close, ongoing contact with participants and knowledge of their medication and medication compliance. As a partial check on reliability of these estimates, file information was reviewed by a psychologist and provided separate but not entirely independent estimates of medication compliance. The degree of agreement between these estimates was moderately high ($r = 0.65$)

Procedure

The study and its informed consent procedures were approved by the Institutional Review Board at the University of North Texas. In addition, the study was also subjected to additional ethical reviews at both John Peter Smith Hospital and the Dallas VA Medical Center. Each participant was given a copy of the consent form and asked to listen as it was read aloud by the examiner. After any questions were answered, each participant included in the study gave their written informed consent.

Participants were assigned to one of the three conditions on the basis of their medication compliance. Approximately one week following the group assignment, participants were administered the SADS by a research psychologist. The minimum time to complete the interview was one hour. However, many participants who had difficulty following the questions or participating for an extended period of time, were interviewed over several hours with multiple breaks.

Results

Nearly one-half (40 or 44.4%) of the sample met the criteria for medication compliance. Most of the remaining participants were

noncompliant (38 or 42.2%) with a small percentage (12 or 13.3%) of participants in the mixed group. As a preliminary analysis, we examined the sociodemographic variables for the three groups. Table 1 summarizes the basic demographic information. Compliance with medication evidenced a significant relationship with age ($r = 0.31$, $p < 0.01$); this difference was in the predicted direction (i.e., younger were less compliant). Other sociodemographic variables were not associated with medication compliance and produced negligible correlations: gender ($r = 0.06$), race (i.e., white versus non-white, $r = 0.04$), educational level ($r = 0.04$), marital status (i.e., married versus not currently married, $r = 0.09$), and years of employment ($r = 0.07$).

Diagnostic interviews, such as the SADS, pose a statistical quandary regarding Type I and Type II errors, based on the large number (i.e., 72) of individual symptoms. The likelihood of a Type I error (i.e., interpreting a result as significant when it is not) increases with the number of comparisons. One solution is the adoption of a very stringent standard (e.g., $p < 0.0001$) to minimize Type I error, but this increases the likelihood of Type II error (i.e., interpreting a result as nonsignificant when it is actually significant). To address this quandary, we eliminated ten variables that were infrequently observed (<20%) in this population, prior to any analysis. To balance our concern for Type I and Type II errors, we selected $p \leq 0.01$ as the minimum estimate of significance. Symptoms with $p < 0.05$ and > 0.01 are considered to be nonsignificant trends.

The first step was to identify specific symptoms that correlated significantly with medication compliance. We identified three symptoms that were correlated significantly: subjective anger ($r = 0.30$), severity of delusions ($r = 0.29$), and severity of hallucinations ($r = 0.29$). In addition, four nonsignificant trends were observed: lack of energy ($r = 0.24$), overt irritability ($r = 0.22$), psychic anxiety ($r = 0.21$), and bizarre behavior ($r = 0.21$). Importantly, both significant differences and nonsignificant trends were in the predicted direction (i.e., greater impairment was associated with greater level of noncompliance).

The effects of a patient's current and past level of functioning on medication compliance was investigated using Pearson product moment correlations. The participants' compliance percentage was correlated with two variables from the Global Assessment of Functioning Scale of the SADS (current worst period and worst period the week prior to admission) to determine if any significant relationships existed. A nonsignificant trend was noted for worst period the week prior to admission ($r = 0.23$) but the correlation for current worst period was not significant ($r = 0.17$). Notably, the nonsignificant trend was in the predicted direction (i.e., greater impairment with less compliance).

The second step was to test the usefulness of these symptom ratings, combined with age in the classification of medication compliance. Because of the relatively small number in the mixed group, we limited the subsequent analysis to compliant and noncompliant groups. We employed a stepwise discriminant analysis to measure each symptom's relative contribution as well as the overall classification rate. The discriminant model was significant ($p = 0.0002$) with a Wilks' lambda of 0.8213. However, the model accounted for only a modest percentage of the variance (17.9%) with a canonical correlation of 0.42.

The discriminant model correctly classified approximately two-thirds (68.0%) of the two groups and performed equally well for compliant (27 of 40; 67.5%) and noncompliant (26 of 38; 68.4%) groups. Inspection of the discriminant model revealed that three variables contributed the most to the classification; these are listed with standardized canonical coefficients included in parenthesis: younger age (0.51), subjective anger (0.53), and bizarre behavior (0.61). As a one-stage model, future research is needed to cross-validate these results.

TABLE 1—*Descriptive characteristics of medication compliant (*n = *40), mixed (*n = *12), and noncompliant (*n = *38) patient groups with schizophrenia.*

Characteristics	Groups		
	Compliant	Mixed	Noncompliant
Age (years)			
Range	30–75	19–69	19–69
Mean (SD)	47.0 (11.7)	44.3 (12.5)	39.2 (12.0)
Sex, *n* (%)			
Male	28 (45.9)	10 (16.4)	23 (37.7)
Female	12 (41.4)	2 (6.9)	15 (51.7)
Education (years)			
Range	<7–20	7–12	7–16
Mean (SD)	12 (1.36)	12 (1.02)	12 (0.95)
Racial Composition, *n* (%)			
White	24 (43.6)	5 (9.1)	26 (47.3)
African American	14 (42.4)	7 (21.2)	12 (36.4)
Hispanic American	2 (100)	0	0
Marital Status, *n* (%)			
Single	14 (40.0)	3 (8.6)	18 (51.4)
Married	6 (37.5)	4 (25.0)	6 (37.5)
Widow	3 (60.0)	1 (20.0)	1 (20.0)
Separated	3 (37.5)	1 (12.5)	4 (50.0)
Divorced	14 (53.8)	3 (11.5)	9 (34.6)

Discussion

Medication compliance is an enduring problem in the effective treatment of outpatients with schizophrenia. Consistent with previous research (31,32), the present study found that a substantial percentage (42.2%) were noncompliant with medication and that a smaller percentage (13.3%) were variable in their compliance. Among persons diagnosed with schizophrenia, these percentages are even more alarming when we realize that they constitute a subgroup that complies with major components of treatment but resist medication. In other words, patients involved in the study were actively involved in treatment; if anything, their participation in the study signifies a greater rather than lesser involvement in their treatment program. We suspect that the magnitude of medication noncompliance would be substantially higher, if we took into account patients with schizophrenia that either decline involvement in such research or resist all forms of treatment.

We failed to find empirical support for most sociodemographic variables that other investigators linked with medication noncompliance. The sole exception was age with younger participants evidencing less compliance. Interestingly, age was a significant predictor, independent of psychopathology, when employed in the stepwise discriminant analysis.

The main thrust of the study was the exploration of specific symptoms and their association with medication noncompliance. Of considerable interest, it was found that the severity of hallucinations and delusions were correlated positively with noncompliance. Several nonexclusive hypotheses must be entertained. These results could suggest that more impaired persons have a decreased ability to comply with medications (i.e., impairment impedes compliance). Alternatively, noncompliant patients may manifest greater impairment on these symptoms because of their noncompliance (i.e., noncompliance impedes treatment gains). Finally, lack of past improvement with medication coupled with troublesome

side effects may contribute to noncompliance (i.e., lack of treatment gains impedes compliance). Only longitudinal studies will enable researchers to disentangle these hypotheses and identify specific patterns underlying noncompliance. In addition, comparisons of forensic and nonforensic samples are likely to prove useful to test the possible effects of severe sanctions on medication compliance. In comparing our results to Wiederlanders and Choate (16), the presence of such sanctions did not appear to diminish problems with treatment compliance.

Given the methodological improvements in both the classification of medication compliance and the systematic assessment of symptom severity, what are the implications of the current study for medication noncompliance in chronic patients with schizophrenia? By extension, what are implications of the study for the outpatient management of mentally disordered offenders? These implications are detailed below.

1. The severity of psychotic symptoms, especially hallucinations and delusions, appears to be central to medication compliance. Especially when these psychotic symptoms influence substantially patient behavior, the likelihood of medication compliance diminishes.

2. Depressive and manic symptoms do not appear to be associated with medication compliance.

3. Of particular concern to the management of forensic patients is the continued assessment and treatment of anger and aggression. The current results suggest that anger and overt irritability are also related to medication noncompliance.

4. Previous research by Rogers and his colleagues (38) suggests that general functioning (e.g., GAF ratings) is likely to predict forensic patients that are likely to have difficulty with community adjustment and require rehospitalization. In the present study, we also found a nonsignificant trend between overall severity and noncompliance.

Most forensic practices do not allow the luxury of full SADS administrations. One practical alternative would be the implementation of the SADS-C (39), which provides for the rapid assessment of 45 key symptoms. Of relevance to the current investigation, the SADS-C assesses each of the significant correlates and nonsignificant trends found in this study. In this way, forensic mental health professionals could assess periodically treatment response, past treatment compliance, and targeted symptoms, all of which are likely to contribute to current medication noncompliance.

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