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Longitudinal Treatment Outcome of African American and Caucasian Patients with First Episode Psychosis

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Abstract

Our analyses examined the outcome differences between Black and White first-episode psychotic patients over the course of one year, and explored the interactive effects of gender, diagnosis, and race on treatment outcome. A consecutive series of patients who were experiencing a first episode of psychosis ($n = 199$) were recruited into our study from the inpatient and outpatient services at a psychiatric clinic. Global functioning, positive, negative, affective, and depression symptoms and treatment adherence were assessed at baseline prior to treatment and during follow-up up to one year. Linear mixed-effects models with random intercept parameters were employed to compute individual trajectories in symptom and functioning characteristics over the one-year course of the study. Black patients ($n = 62$) were found to experience significantly less improvement in symptoms, bizarre behavior, avolition, anhedonia, and functional performance, and affective symptoms than their White counterparts ($n = 137$). In addition, Black female patients experienced less improvement in affective flattening. Black patients also had significantly lower adherence scores than their White counterparts both at six month and one-year follow-up. While both groups of patients have experienced significant improvement during the one-year treatment, that of the Black patients is less optimal.

Keywords

longitudinal treatment outcome; Black and White first episode patients

Schizophrenia affects all racial/ethnic groups. However, Black patients of in the United States and other countries are more likely to be diagnosed with this disorder than patients of

European heritage (White) (Bresnahan et al., 2007; Fearon et al., 2006; Strakowski et al., 1996a). The rates of schizophrenia diagnosis from both public and private hospitals were consistently higher for Blacks than for Whites of the same sex (Collins, Rickman, & Mathura, 1980). The Prenatal Determinants of Schizophrenia (PDS) study reported that Blacks were about two-fold more likely than Whites to be diagnosed with schizophrenia even after adjusting for family social economic status (SES) at birth (Bresnahan et al., 2007). A study conducted in Florida through in-patient chart review showed that a psychotic disorder diagnosis was 4.3 per 1,000 for Black patients versus 1.3 per 1,000 for Whites, after adjusting for gender and age (Bao, Fisher, & Studnicki, 2008).

Variations in symptoms or levels of severity have also been observed between Black and White patients with psychotic disorders, including schizophrenia. While patients from different ethnic groups appear to share similar rates of experiencing symptoms such as delusions and hallucinations, the content of the symptoms might vary across racial/ethnic groups (Vega & Lewis-Fernández, 2008). Black patients have been found to exhibit paranoia related to persecutory delusions from more generalized rather than specific sources of harm (Yamada et al., 2006). White patients with schizophrenia have been found to display more grandiosity in their delusional content and more severe excitement symptom scores than their Black counterparts, as measured by the Positive and Negative Symptom Scale (PANSS) (Barrio et al., 2003). Chu and colleagues (1985) reported that Black patients with schizophrenia showed more anger, disorientation, asocial behavior, and hallucinations, whereas White patients exhibited more symptoms of irrelevant speech. White patients have been reported to be more symptomatically impaired and show more emotional disturbance, behavioral problems, negative symptoms, and flat affect than their Black counterparts (Barrio et al., 2003; Fabrega, Mezzich, & Ulrich, 1988).

Gender has also been found to interact with race and ethnicity in presenting psychotic symptoms. For example, Arnold and colleagues (2004) report that Black men tend to present with more psychotic and first-rank psychotic symptoms than Black women.

Ethnopsychopharmacological studies have shown significant disparities in prescription practices, adherence rates, dosages, and metabolic side-effects between minority and White patients with psychiatric illnesses, including psychotic disorders (Arnold et al., 2004; Chung, Mahler, & Kakuma, 1995; Kelly et al., 2006; Kuno & Rothbard, 2002; Meyer, Rosenblatt, Kim, Baker, & Whitehead 2009; Perkins et al., 2008; Shi et al, 2007; Van Dorn, Swanson, Swartz, & Elbogen, 2005). To date, however, few studies have examined racial disparities in the outcomes of individuals from the earliest phases of psychosis. A comprehensive search of such studies on PubMed in the past decade yielded very few outcome studies of Black and White patients and the findings have been relatively inconsistent. Specifically, Emsley and colleagues. (2002) examined treatment response of Black, White, and mixed descent participants with schizophrenia and schizophreniform disorder in South Africa. Black patients had greater reductions in both positive and negative symptoms, as measured by PANSS scores than White patients. The authors attributed ethnic treatment response differences to more severe symptoms among Blacks at baseline. A study on treatment response to risperidone in youths with schizophrenia spectrum disorders conducted by Patel and colleagues (2006) showed that both White and Black patients

evidenced significant improvement over a two-year period of time on Child Behavior Checklist (CBCL) total scores. However, the Black patients only showed significant improvement in CBCL total and internalizing scores, but not in externalizing scores. Ciliberto and colleagues (2005) examined the impact of race/ethnicity on treatment response in their 12-week, randomized, double-blind study of patients with schizophrenia or schizoaffective disorder either getting placebo or long-acting risperidone. The authors, however, did not find race a significant factor contributing to treatment response, as all patients who received the long-acting risperidone had a significant reduction of PANSS positive, negative, and anxiety/depression scores. Nevertheless, it was unclear whether the participants in these studies were in their first episode. The mixed results could be because patients were at different stages of their illness.

In summary, substantial research has been conducted to examine the prevalence, manifestations, and prescription disparity among minority patients with psychosis. However, the literature on the impact of race/ethnicity on treatment outcome from the earliest phases of the illness is scarce and the findings are inconsistent. Studies of the early course of psychotic disorders avoid the potential confounds of prior treatment and illness chronicity. Furthermore, few studies have examined the role of gender and diagnosis on outcome among patients with first episode psychosis. Treatment outcome findings could inform both clinical practice and research. Therefore, the purpose of this study and analysis was to examine outcome differences between Black and White first-episode psychotic patients over the course of one year, and explore the interactive effects of gender, diagnosis, and race on treatment outcome.

Methods

Participants

A consecutive series of patients who were experiencing a first episode of psychosis ($n = 199$) and who met screening criteria were recruited into our study from the inpatient or outpatient services at the Western Psychiatric Institute and Clinic, University of Pittsburgh Medical Center. The data was collected between 1996 and 2004. The protocol had been approved by the University of Pittsburgh Institutional Review Board. The patients were diagnosed by DSM-IV criteria (American Psychiatric Association, 1994) at consensus conference meetings of senior diagnostician/clinical researchers approximately one month after entry into the study. All available clinical information was used, including diagnostic data gathered using the Structured Clinical Interview for DSM Disorders (SCID) (Spitzer et al., 1990). Exclusion criteria were age greater than 50 or less than 12, significant head injury or medical illness affecting the central nervous system function, pregnancy, mental retardation, and current diagnosis of substance use disorder. To avoid the confounding effects of sustained medication treatment, we excluded subjects who had received more than 2 weeks (in their lifetimes) of antipsychotic treatment. Patients were followed up and treated with standard antipsychotic medications and supportive individual and/or group psychotherapy in community treatment programs. After a complete description of the study to the participants, written informed consent was obtained.

Measures and Procedure

Duration of Untreated Illness (DUI) was assessed in each case by the same raters using all clinical information, including medical records, reports by family members or significant others, and SCID interviews. The most likely date of illness onset, as defined by the onset of prodromal positive or negative symptoms, was then determined in consensus diagnostic conferences.

Psychopathological ratings were carried out by trained raters who also participated in the diagnostic meetings described above. Illness severity was assessed using the Global Assessment of Function (GAF) scale. GAF scores at 4 weeks, following stabilization of acute psychotic symptoms, were taken to reflect baseline level of functioning. Positive and negative symptoms were measured, respectively, using the Scale for the Assessment of Positive Symptoms (SAPS) and the Scale for the Assessment of Negative Symptoms (SANS) (Andreasen, Flaum, Swayze, Tyrrell, & Arndt, 1990). General psychopathology symptoms were rated using the affective items from the Brief Psychiatric Rating Scale (Overall & Gorham, 1962; Shafer, 2005) and the 24-item Hamilton Rating Scale for Depression (Hamilton, 1960). Scales were scored by averaging across items to produce an average rating for each of the symptom domains assessed. Ratings were conducted by trained and reliable ($Kappa > .5$) raters.

We also did a subset analyses to look at the medication adherence status of Black and White patients. Medication adherence was measured with the Treatment and Medication Compliance Data Scale (TMCDS) (Ira Glick, Unpublished). The TMCDS is rated by a clinician using a scale from 0 (non-compliance) to 100 (excellent compliance). A rating of “0” indicates that the participant is not taking medications, abusing medications, and/or not following treatment plans entirely. A rating of “100” indicates that the participant is taking all medications as prescribed (may forget occasionally) and/or following all treatment plans as best as he or she can. There are 6 anchor descriptions at 20-point intervals and participants can be rated anywhere within intervals based on data obtained regarding compliance. Treatment compliance was measured at two points – 6 months after entry in study and at 12 months. The same raters typically conducted the baseline and follow-up ratings for each patient.

Data Analysis

Cross-sectional differences in demographic and illness characteristics between Black and White participants were analyzed using descriptive measures of frequency, central tendency, and dispersion; and their statistical significance tested using two-tailed *t*-tests for continuous data and χ^2 tests for categorical data. Linear mixed-effects models with random intercept parameters were employed to compute individual trajectories in symptom and functioning characteristics over the one-year course of the study. Random effects for slope parameters were not included, as initial analyses revealed little heterogeneity in individual slopes beyond the substantial variability observed at baseline. Differences in baseline levels and rates of change of symptom and functioning characteristics between races were assessed by examining the main effects of race and race by time interaction effects, respectively. In addition, interactions between race, gender, and diagnosis of the presence of schizophrenia/

schizoaffective disorder versus other psychotic disorders were also investigated to examine possible differences in racial trajectories by gender and diagnostic status. All mixed-effects models were adjusted for the potential confounding effects of age, gender, socioeconomic status, diagnosis, and IQ, and made use of autoregressive error structures most appropriate for longitudinal data (Raudenbush & Bryk, 2002). All parameters were estimated using restricted maximum-likelihood, and missing data were estimated using the expectation maximization approach (Dempster, Laird, & Rubin, 1977). Mann-Whitney U tests were used to examine medication adherence levels of Black and White patients.

Results

Sample Characteristics

Table 1 presents baseline demographic and clinical characteristics for Black and White first-episode patients. Overall, the sample was young and predominantly male. Most individuals had completed high-school, 100 (50%) were diagnosed with schizophrenia or schizoaffective disorder, 61 (31%) with another psychotic disorder (e.g., psychosis not otherwise specified, schizophreniform disorder or delusional disorder), and 38 (19%) with affective psychosis. The average length of untreated illness was 2.02 years ($SD = 3.61$). There were no significant differences between racial groups with regard to age, education, or duration of untreated illness. However, Black participants were significantly more likely to be diagnosed with schizophrenia/schizoaffective disorder and had lower socioeconomic status. In addition, a non-significant trend suggested the recruitment of fewer Black participants who were male.

Racial Differences in Symptom and Functional Outcomes

We examined differences between these participants in symptom and functional outcomes over the course of 1 year. As can be seen in Table 2, after adjusting for baseline clinical and demographic characteristics, there were few significant baseline differences between Black and White first-episode patients with regard to symptomatology and global functioning. Only BPRS affective and HAM-D depression ratings proved to be significantly different between racial groups, with White patients demonstrating significantly greater levels of affective symptoms at baseline compared to Black patients. No other significant symptom or functioning differences were observed at baseline. When examining general rates of improvement across the total study sample, patients demonstrated significant levels of improvement (see Table 2).

Despite a general trend toward improvement in both White and Black first-episode patients, with the baseline differences adjusted, a number of significant differences emerged between the two groups with regard to symptom and functional improvement in the year following their onset of psychosis (see Table 2). While no significant differences emerged in rates of improvement in hallucinations and delusions, Black patients experienced significantly less improvement in thought disorder symptoms ($d = .44$), and a trend indicated the same pattern of results for bizarre behavior ($d = .32$). The disadvantage of Blacks across both of these domains was medium in magnitude. Inspection of interactions with diagnostic status

indicated that Black patients with a diagnosis of schizophrenia were particularly less likely to show improvement in thought disorder symptoms (see Figure 1).

Black patients also showed significantly less improvement in the negative symptoms over the course of the study, with a particularly large disadvantage in avolition improvement ($d = .78$), and medium-sized differences in improvements in anhedonia ($d = .47$). Furthermore, inspection of interactions with gender demonstrated that affective flattening symptoms were significantly less likely to improve in Black female patients (see Figure 2). Affective symptoms on the BPRS ($d = .60$) and HAM-D ($d = .45$) depression scores in the year following the onset of psychosis also medium-sized disparities between Black and White participants, with Black patients showing less improvement even after adjusting for the sizable baseline differences in general psychopathology between Blacks and Whites. Changes in depressive symptomatology were highly significantly related to negative symptom change ($p < .0001$), and when accounted for, racial differences in anhedonic improvement were no longer apparent ($p = .457$), although a robust Black-White difference in improvement in avolition symptoms remained ($p = .011$). Finally, large disparities existed between Black and White first-episode patients in functional improvement ($d = -.84$), with Black participants showing less functional improvement over the course of the year compared to their White counterparts. Together, these findings highlight broad and substantial disadvantages in symptom and functional improvement in Black patients experiencing a first-episode of psychosis.

With the results showing significantly less improvement in negative symptoms among Black patients, we suspected if lack of medication adherence could contribute to these results. Therefore, we did analyses with a subset of the participants using Mann-Whitney U tests to examine if medication adherence was different between the two groups of patients at six-month and one-year time points. There were 59 White patients and 18 Black patients at the six-month assessment (38.7% of total patients at baseline) and 50 White and 17 Black patients at the one-year follow-up assessment (33.7% of total patients at baseline). The results show that Black patients had significantly lower adherence score than their White counterparts both at sixth month (White patients: $M = 88.30$, $SD = 15.0$; Black patients: $M = 71.39$, $SD = 27.75$; $U = 293$, $df = 1,76$; $P = .009$; $d = -.53$) and at one year follow-up (White patients: $M = 92.29$, $SD = 15.27$; Black patients: $M = 79.12$, $SD = 26.59$; $U = 269$, $df = 1,66$; $P = .009$; $d = .60$).

Discussion

To our knowledge, this was one of the few longitudinal studies to examine the impact of race on outcome in patients with first-episode psychosis. Our study demonstrates that both Black and White participants had significant symptom reductions and functional improvement over the one-year follow-up. However, important racial and ethnic differences were seen in treatment outcome in first-episode patients one year after their development of psychosis. Specifically, Black participants experienced significantly less improvement in thought disorder, negative, and general psychopathology symptoms, as well as functioning, even after adjusting for the baseline differences in clinical and sociodemographic characteristics.

Several explanations may account for the lack of symptomatic and functional improvement in Black participants in our study. First, there is evidence that psychiatric disorders including psychosis have greater stigma attached to them in the Black population. Stigma is the “most formidable obstacle to future progress in the arena of mental illness and health” (UDHHS, 2001). Blacks with psychiatric disorders are more likely to be viewed as morally inferior which may result in a lessened tendency to adhere to treatment (Alvidrez, 1999). Furthermore, stigma may reduce Black patients’ access to resources and increase their isolation and hopelessness, thereby decreasing or slowing down their recovery (Gary, 2005).

Secondly, psychopathological symptoms may be regarded as weaknesses in character among minority populations, and therefore, may not get well-deserved support at home or in the community for engagement in treatment. For example, Young, Griffith, and Williams, (2003) found low rates of referral for depressive symptoms from pastors of Black background. These pastors believed that people with a mental illness could cure themselves if they “put their mind to it.”

In addition, there may be differential manifestations of negative symptoms in Black and White patients. It is possible that symptoms in Black patients are misinterpreted, misdiagnosed, or underdiagnosed, due to “social cultural distance between clinicians and minority patients or stereotyping in the clinical encounter” (William & Earl, 2007). However, this is unlikely since diagnostic assessments in this study were carried out by a highly experienced multicultural group of researcher-clinicians using structured interviews as well as all clinical data.

Thirdly, researchers have reported lower rates of medication adherence in Black patients with schizophrenia and schizoaffective disorder (Opolka, Rascati, Brown, & Gibson, 2003). Our study also points to the possibility that a lower level of medication adherence among Black participants could be one reason for the lack of improvement in symptoms among Black first episode participants, thereby hindering their improvement in daily functioning. Financial burden, access difficulties, and stigma might account for the lower level of medication adherence among Black patients. Further studies should be conducted to explore possible reasons for the lack of medication adherence in Black patients, thereby reducing disparity in this perspective.

Lastly, regarding gender-by-race interaction in the outcome, our results show that White males showed less improvement in affective flattening over a course of one year than White female patients, whereas Black females evidenced less improvement than Black males. More studies should be conducted to examine gender-by-race interaction effect on affective flattening. There was no race effect on hallucination and delusional symptoms, except on thought disorder, where Black participants had less improvement even though there were no significant differences at baseline between Black and White patients.

Our results should be interpreted in light of some methodological limitations and characteristics of our sample. Since this was a naturalistic study, the wide variation in treatment settings across the sample and our inability to control for medication differences because of its availability in only a small subset of the sample might be limitations. In

addition, the paucity of treatment outcome studies involving non-White patients makes it difficult to compare our findings with existing literature and draw conclusions about our findings. Nevertheless, our observations point to the need to pay particular attention to the management of Black patients early in psychotic illness, since they may be either less responsive or less accepting of treatment. However, our study had a 70% retention at 6 months, and a 62% retention at 1 year, which provided enough power in data analyses, thereby reliable results. Further longitudinal research using well controlled treatment approaches is needed to replicate our research.

Conclusion

The purpose of this analysis was to examine the treatment outcome differences between Black and White first-episode psychotic patients over the course of one year, and explore the interactive effects of gender, diagnosis, and race on treatment outcome.

This study demonstrates both White and Black patients with first-episode psychosis experienced significant improvement over a one-year period of time. However, a less optimal recovery picture of Black patients was observed. Future studies are warranted to explore possible reasons for the lack of more optimal improvement among Black patients with first episode psychosis.

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Figure 1.
Racial Differences in Thought Disorder Symptoms Between Black and White First-Episode Psychotic Patients By Diagnosis.

Figure 2.
Racial Differences in Affective Flattening Between Black and White First-Episode Psychotic Patients By Gender.

Demographic and Clinical Characteristics Among Black and White Patients Experiencing a First Episode of Psychosis (N = 199)

Table 1

Variable	Black (N = 62)		White (N = 137)		Combined (N = 199)		df	p ^a
	M	(SD)/N (%)	M	(SD)/N (%)	M	(SD)/N (%)		
Age	24.57	(7.36)	24.15	(7.55)	24.28	(7.47)	197	.712
Male	34	(55%)	95	(69%)	129	(65%)	1	.068
Education (yrs)	12.24	(2.73)	13.01	(3.12)	12.77	(3.02)	195	.098
Socioeconomic status	35.02	(12.86)	43.20	(13.93)	40.65	(14.09)	197	< .001
Schizophrenia diagnosis	45	(73%)	72	(53%)	117	(59%)	1	.012
Duration of untreated illness (yrs)	2.47	(4.16)	1.82	(3.35)	2.02	(3.61)	191	.256

^a χ^2 or independent *t*-test, two-tailed, for significant differences between Black and White participants.

Table 2
One-Year Symptom and Functional Outcomes Among Black and White Patients Experiencing a First Episode of Psychosis (N = 199)

Variable	Black			White			Analysis (<i>F</i>)			
	Baseline (N=62)		12 Months (N=17)	Baseline (N=137)		6 Months (N=59)	12 Months (N=50)			
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	Time ^{<i>a</i>}	Race ^{<i>b</i>}	Race × Time ^{<i>d</i>}
Positive Symptoms										
Hallucinations	.95 (.94)	.55 (.52)	.15 (.44)	.91 (.92)	.49 (.50)	.06 (.27)	138.32**	.24		.02
Delusions	.92 (.84)	.56 (.46)	.20 (.57)	.95 (.69)	.54 (.37)	.13 (.33)	157.57**	.13		.34
Bizarre Behavior	.45 (.56)	.32 (.32)	.19 (.36)	.54 (.61)	.30 (.26)	.06 (.25)	81.36**	.29		3.07 [†]
Thought Disorder	.76 (.66)	.48 (.49)	.20 (.64)	.78 (.70)	.46 (.36)	.13 (.40)	107.53**	.16		4.73*
Negative Symptoms										
Affective Flattening	2.00 (.94)	1.97 (.77)	1.94 (.71)	1.99 (.84)	1.85 (.72)	1.71 (.72)	5.57*	.04		.05
Alogia	1.77 (.65)	1.59 (.45)	1.40 (.55)	1.77 (.72)	1.50 (.38)	1.23 (.40)	63.59**	.41		3.52 [†]
Avolition	2.34 (.93)	2.39 (.94)	2.43 (1.06)	2.74 (.96)	2.33 (.87)	1.93 (.97)	45.82**	2.48		10.78**
Social Anhedonia	2.54 (1.01)	2.37 (.87)	2.21 (1.11)	2.66 (.93)	2.37 (.92)	2.07 (.92)	28.81**	.47		4.26*
General Symptoms										
BPRS Affective	2.90 (1.22)	2.54 (.84)	2.19 (.90)	3.60 (1.17)	2.88 (1.01)	2.16 (.93)	131.65**	7.73**		5.72*
Depression	.76 (.39)	.57 (.26)	.37 (.35)	1.03 (.43)	.74 (.39)	.44 (.36)	174.65**	11.01**		5.64*
Global Assessment of Functioning	37.05 (11.06)	47.72 (14.67)	58.39 (16.59)	32.31 (10.08)	44.97 (13.93)	57.62 (14.52)	333.23**	1.21		4.84*

Note. Numerator *df* = 1 for all analyses. BPRS = Brief Psychiatric Rating Scale

^aDenominator *df* ranges from 253 to 259

^bDenominator *df* = 190

[†]*p* < .10

**p* < .05

***p* < .01