Ethnic Differences in Use of Antipsychotic Medication Among Texas Medicaid Clients With Schizophrenia

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Background: Culture and ethnicity have been suggested to influence the presentation of patients with schizophrenia. These factors are thought to affect the diagnoses, courses of treatment, and medical utilization patterns of patients with schizophrenia. Specifically, the differences between whites, African Americans, and Mexican Americans are of particular importance, as these groups comprise the majority of the population in the United States today. The traditional course of treatment for many patients with schizophrenia is the drug haloperidol. However, research has shown that some ethnic groups (African Americans and Mexican Americans) may respond better to atypical drugs, such as olanzapine, but may be less likely to receive these drugs. A better response to the course of treatment results in improved medical utilization patterns. The purpose of this study was to examine if ethnicity helped predict whether Texas Medicaid patients were prescribed haloperidol versus olanzapine when other factors were controlled for.

Method: The study population consisted of 726 patients whose index drug was haloperidol and 1875 patients whose index drug was olanzapine. Patients had an ICD-9-CM diagnosis of schizophrenia or schizoaffective disorder. Texas medical and prescription claims data were used in a logistic regression analysis to determine significant predictors of the type of antipsychotic (haloperidol vs. olanzapine) patients were prescribed. Variables included in the analysis were ethnicity, gender, age, region, other mental illness comorbidities, and previous utilization of medications and resources. Data were collected from Jan. 1, 1996, to Aug. 31, 1998.

Results: The results show that when other demographic and utilization factors were controlled for, African Americans were less likely than whites to receive olanzapine rather than haloperidol.

Conclusion: Ethnicity is a significant predictor of the type of antipsychotic that is prescribed.

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Culture and ethnicity have been suggested influences on the presentation of patients with schizophrenia.[1–5] These factors are thought to affect the diagnoses, courses of treatment, and medical and prescription drug utilization patterns of patients with schizophrenia. Specifically, the differences between whites, African Americans, and Mexican Americans are of particular importance, as these groups comprise the majority of the population in the United States today. Research has suggested that schizophrenia is overdiagnosed among ethnic minority populations.[6–9] An important issue for clinicians when making diagnoses is understanding cultural and ethnic differences in their patients.

The traditional course of treatment for many patients with schizophrenia is the use of conventional antipsychotics such as haloperidol. However, research has shown that some ethnic groups, namely African Americans and Mexican Americans, may respond better to atypical antipsychotics, such as olanzapine, but may be less likely to receive these drugs.[10] These medications are associated with increased efficacy for negative symptoms and better side effect profiles.[11–13] A better response to the course of treatment results in improved medical and prescription drug utilization patterns. Atypical antipsychotics are more expensive than conventional antipsychotics, but they may be more cost-effective over time, as they may prevent hospitalizations and specialist treatment of patients.[14,15]

Most studies of ethnicity in relation to differences in symptom expression and drug response and side effect profiles have been conducted in white and Asian populations, with fewer studies conducted in African American

Table 1. Patient Characteristics by Type of Antipsychotic Prescribed

Characteristic	Haloperidol (N = 726)	Olanzapine (N = 1875)	p Value
Female, %	48.8	53.9	.019*
Age, mean, y	41.46	41.27	.667
Ethnicity, %[a]			
White	35.1	49.2	< .001*
African American	48.9	35.5	< .001*
Mexican American	16.0	15.3	.671
Region, %[a]			
Austin	5.8	10.1	.001*
San Antonio	13.1	16.7	.021*
Fort Worth	7.3	9.3	.100
Lubbock	2.6	3.5	.272
Houston	39.9	21.2	< .001*
Dallas	14.3	22.5	< .001*
Galveston	5.0	6.7	.105
El Paso	7.6	6.5	.307
Waco	0.3	0.7	.168
Other regions	4.1	2.8	.075
Health conditions, %			
Bipolar	17.4	20.1	.111
Substance abuse/alcohol	33.3	28.5	.015*
Nonorganic	62.3	55.3	.001*
Medication and resource utilization prior to antipsychotic initiation			
Previous clozapine use, %	1.8	6.6	< .001*
Previous depot use, %	6.7	8.4	.156
Previous atypical antipsychotic use, %	17.4	25.8	< .001*
Previous no. of antipsychotic medications, mean[b]	0.48	0.87	< .001*
Outpatient physician visits, mean[b]	3.04	3.32	.229
Emergency department visits, mean[b]	0.13	0.10	.027*
Inpatient hospital days, mean[b]	6.31	4.15	< .001*

[a]$p < .001$ for both ethnicity and region overall.
[b]Mean number in the 12 months before initiation of the index drug.
*$p < .05$.

and Mexican American populations. This demonstrates the need for more research in this area on African Americans and Mexican Americans.

Particular concern arises in research studies today around racial disparities in care found among similarly insured individuals, since health insurance is generally considered to be the "great equalizer" in the health system.[16] The preceding statement lends support to the need for the present study, since it used the Texas Medicaid Database, which is composed of patients who are similarly insured and make similar incomes. Therefore, the results of this study contribute valuable information about the differences surrounding racial disparities in care when individuals are similarly insured.

The purpose of this study was to examine if ethnicity helped predict whether Texas Medicaid patients were prescribed haloperidol versus olanzapine when controlling for the effects of gender, age, region, other mental illness comorbidities, and previous utilization of medications and resources.

METHOD

Data Source

The Texas Health and Human Services Commission was the source of the Medicaid claims data for this study. Medical claims data were extracted from the Texas Medicaid Management Information System, while pharmacy claims data were extracted from the Texas Vendor Drug Program paid prescription claims database. The combined database was the primary source of data for this study. In addition, information related to individual patient enrollment periods was extracted from the eligibility files maintained by the Texas Department of Human Services.

Study Population

Individual patient-level claims records were extracted and analyzed between Jan. 1, 1996, and Aug. 31, 1998, in order to encompass 1 year before the index period (Jan. 1, 1997, through Aug. 31, 1998) for patients who

1. were between 21 and 65 years of age;
2. were initiated on treatment with haloperidol or olanzapine between Jan. 1, 1997, and Aug. 31, 1998, and had no previous use of the index medication for a period of 12 months prior to the dispensing of a prescription for the index drug;
3. had at least 1 recorded inpatient hospital claim or at least 2 recorded outpatient/ambulatory visit claims with an accompanying primary or secondary diagnosis related to schizophrenia or schizoaffective disorder (ICD-9-CM code 295.XX) during a period of 12 months prior to initiation of haloperidol or olanzapine; and
4. were eligible for Medicaid 12 months prior to the date of initiation with haloperidol or olanzapine.

Variables

The variable of interest (dependent variable) was whether the index drug, haloperidol (coded as 0) or olanzapine (coded as 1), was prescribed.

Potential predictive factors may include demographics, comorbidities, medication history, prior service use, and clinical severity. Direct measures of clinical severity were not available in the dataset. Measures of the other predictive factors were available. The independent variables used in the analyses are found in Table 1. They included binomial variables to capture gender, 3 categories of ethnicity, 10 regions, 3 mental illness comorbidities, and 3 independent categories of prior antipsychotic use. In addition, the independent variables included continuous variables representing age, the number of different antipsychotic medications used in the prior 12 months, and the number of outpatient physician visits, emergency department visits, and inpatient hospital days in the prior 12 months.

Statistical Analyses

After the data were collected, they were analyzed for descriptive purposes. In addition, logistic regression analysis was performed on the data, and odds ratios and confidence intervals were interpreted. The Nagelkerke R square value was also interpreted. This value attempts to imitate the interpretation of multiple R square based on likelihood. The logistic regression was repeated in study population subsets that were homogeneous regarding covariates that were strongly associated with medication choice to evaluate whether the association between ethnicity and medication choice was relatively consistent throughout the study population.[17] The statistical analyses were performed using SPSS software[18] with an alpha level set at .05.

RESULTS

A total of 2601 patients met the study criteria; 726 had haloperidol as their index drug and 1875 had olanzapine as their index drug. Table 1 is a description of the independent variables used in the logistic regression. A series of t tests and chi-square analyses were conducted to construct the table. Table 1 shows that with no control for other factors, there were significant differences between the groups of patients initiated on treatment with haloperidol and olanzapine. Women were significantly more likely to receive olanzapine than haloperidol. Ethnicity and the region of Texas made a significant difference in the type of antipsychotic that was prescribed. Patients with substance abuse/alcohol and nonorganic comorbidities were significantly more likely to receive haloperidol than olanzapine. Patients with previous clozapine use, previous atypical antipsychotic use, and high numbers of previous antipsychotic medications were significantly more likely to subsequently receive olanzapine. In addition, patients with high numbers of emergency department visits and inpatient hospital days were significantly more likely to subsequently receive haloperidol.

Table 2 shows the results of the logistic regression analysis that was performed on the data, adjusting for all available baseline variables. This analysis was done to predict the odds of receiving olanzapine over haloperidol. The table shows that when other variables were controlled for, 11 variables were significant at the $p < .05$ level. The Nagelkerke R square was 0.198. The odds ratios (and corresponding 95% confidence intervals) indicated that African Americans and patients from Houston, El Paso, or the "other" regions; patients with a nonorganic comorbidity; and patients with more previous inpatient hospital days were less likely to receive olanzapine. Being female and having a bipolar comorbidity, previous clozapine use, previous depot use, and a high previous number of antipsychotic medications were all associated with an increased chance of receiving olanzapine.

Table 2. Logistic Regression Results of the Type of Antipsychotic Prescribed Regressed on the Independent Variables[a]

Independent Variable	Odds Ratio (95% confidence interval) of Receiving Olanzapine	p Value
Female	1.339 (1.099 to 1.632)	.004*
Age	0.994 (0.984 to 1.003)	.202
Ethnicity		
African American	0.614 (0.495 to 0.761)	< .001*
Mexican American	0.766 (0.567 to 1.036)	.084
Region		
San Antonio	0.865 (0.557 to 1.344)	.520
Fort Worth	0.887 (0.547 to 1.439)	.627
Lubbock	0.870 (0.457 to 1.657)	.673
Houston	0.408 (0.274 to 0.607)	< .001*
Dallas	1.199 (0.783 to 1.837)	.404
Galveston	0.962 (0.565 to 1.637)	.886
El Paso	0.518 (0.311 to 0.865)	.012*
Waco	1.341 (0.283 to 6.360)	.712
Other regions	0.460 (0.254 to 0.835)	.011*
Health conditions		
Bipolar	1.375 (1.069 to 1.769)	.013*
Substance abuse/alcohol	0.956 (0.771 to 1.184)	.680
Nonorganic	0.782 (0.636 to 0.961)	.020*
Medication and resource utilization prior to antipsychotic initiation		
Previous clozapine use	4.785 (2.620 to 8.737)	< .001*
Previous depot use	1.569 (1.087 to 2.265)	.016*
Previous atypical antipsychotic use	0.814 (0.622 to 1.066)	.135
Previous no. of antipsychotic medications	2.716 (2.282 to 3.232)	< .001*
Outpatient physician visits[b]	1.016 (0.997 to 1.036)	.099
Emergency department visits[b]	0.862 (0.684 to 1.085)	.207
Inpatient hospital days[b]	0.985 (0.976 to 0.994)	.001*

[a]Olanzapine was coded as 1, haloperidol was coded as 0; for ethnicity, white was used as the reference category; for gender, male was used as the reference category; for region, Austin was used as the reference category.
[b]Resource utilization in the 12 months prior to the initiation of an antipsychotic medication.
*$p < .05$.

To assess whether there was a change over time in the effect of ethnicity on which medication was received, the study period was divided into two 10-month segments (Jan. 1–Oct. 31, 1997, and Nov. 1, 1997–Aug. 31, 1998), and the effect of ethnicity was computed in each half. The African American result was consistent in magnitude and statistical significance (odds ratio for the first 10 months: 0.624, $p = .001$; odds ratio for the last 10 months: 0.592, $p = .003$). However, the Mexican American result was statistically significant in the first 10 months of the study period (odds ratio = 0.607, $p = .010$), but was not significant in the last 10 months of the study period (odds ratio = 1.150, $p = .601$).

During this study period, haloperidol was available in both oral and long-acting depot forms. To test whether the depot formulation of haloperidol made a difference in use, the analysis was run again excluding the depot haloperidol users. The additional analysis resulted in no substantial effect on the race variables. Before the 147 depot haloperidol users were excluded, the odds ratios and cor-

responding p values were as follows: African American, 0.614, p < .001, and Mexican American, 0.766, p = .084. After the depot haloperidol users were excluded, the odds ratios and corresponding p values were as follows: African American, 0.568, p < .001, and Mexican American, 0.728, p = .068.

An additional logistic regression analysis was conducted without the 68 patients that were simultaneously covered under both Medicaid and Medicare. This analysis did not result in any changes in significant findings. In addition, 3 analyses were performed on the data to verify that the ethnic effect persists in homogeneous subsets of the patient sample. When only the largest region of Texas, Houston, was analyzed, both African Americans (odds ratio = 0.372, p < .001) and Mexican Americans (odds ratio = 0.459, p = .001) were significantly less likely to receive olanzapine than haloperidol. For those patients who had a bipolar comorbidity, both African Americans (odds ratio = 0.423, p = .001) and Mexican Americans (odds ratio = 0.335, p = .002) were significantly less likely to receive olanzapine. Lastly, among female patients, both African Americans (odds ratio = 0.633, p = .003) and Mexican Americans (odds ratio = 0.619, p = .035) were significantly less likely to receive olanzapine.

DISCUSSION

As can be seen in Table 1, without controlling for other factors, significant differences did exist among the groups for ethnicity, gender, region, other mental illness comorbidities, and previous utilization of medications and resources. As can be seen in Table 2, when controlling for other variables, 11 of the 23 independent variables entered into the logistic regression analysis for haloperidol versus olanzapine resulted in significant findings.

The regional differences in medication choice may be due to differences in physician prescribing practices in different regions of Texas. The greater likelihood that patients with bipolar disorder, prior depot use, prior clozapine use, and higher numbers of previous antipsychotic medications would use olanzapine may reflect the fact that these patients may have been more severely ill or treatment resistant. When patients are experiencing less-than-optimal outcomes with conventional antipsychotics, a trial of one of the atypical antipsychotics may be appropriate, as the pharmacokinetic profiles of these drugs are very distinct from those of the conventional antipsychotics.[11–13]

The odds ratio of receiving olanzapine for African Americans was 0.614, indicating that African Americans were about a third less likely to receive an atypical antipsychotic than whites were. The effect was consistent in homogeneous subsets of the population. This finding supports the claim that African Americans are less likely to receive atypical antipsychotics.[19] One possible explanation for the observed differences is the variation in the content of the symptoms that are presented by the patients. Studies have shown that mental health problems may exhibit different patterns of expression and treatment response among different ethnic groups.[5] Subtle differences in the presentation of symptoms between African Americans and whites often cause clinicians to interpret the symptoms differently.[4] This could influence the type of antipsychotic that a physician prescribes.

Conventional antipsychotics such as haloperidol are proven to be effective when treating the positive symptoms of schizophrenia. Olanzapine is proven to be effective in treating both positive and negative symptoms.[12] Some studies have found African American patients with schizophrenia to have more paranoia and more positive symptomatology such as hallucinations and delusions than other ethnic groups.[2] Others have found that African American patients were less symptomatically impaired and had fewer negative symptoms than white patients.[1] If physicians tended to reserve olanzapine for patients in whom they find predominantly negative symptoms, some relatively lower use of olanzapine in African Americans might be expected. However, the magnitude of the difference found in this study in use of olanzapine versus haloperidol in African Americans versus whites seems to be larger than what would be expected due to differences in symptomatology alone.

Cultural bias and miscommunication can have an influential impact on the diagnosing and prescribing patterns of physicians.[5,20] Some physicians may give disproportionate weight to the presence of positive symptoms in ethnic minority patients, leading to a conventional antipsychotic prescription rather than an atypical antipsychotic prescription. Research has shown that African Americans are more likely than whites to be treated with high doses of older antipsychotic medications, sometimes unnecessarily.[8,21] The lack of a good physician-patient relationship in which both parties easily understand one another may be a contributing factor, especially when the physician and patient are of different ethnic backgrounds. Miscommunication can lead to misdiagnosing, which may result in prescriptions for antipsychotics when they are not needed.[3,6,9] African Americans tend to be diagnosed more often as suffering from schizophrenia than any other ethnic group.[22]

Knowledge of the ethnic differences in pharmacodynamics, pharmacokinetics, and pharmacogenetics could be beneficial to physicians. The dose needed to attain a similar level of response in the treatment of schizophrenia appears to be similar for whites and African Americans.[22] However, as mentioned previously, African Americans often receive higher doses of neuroleptics than whites.[8,21,22] Studies have shown that Mexican Americans, on the other hand, may require lower doses than their white counterparts.[22,23] This additional knowledge, along with improved cultural communication and elimination of bias, may help physicians optimize individual treatment regimens for ethnic minority patients.

The available literature surrounding prescribing patterns of physicians for Mexican American patients with schizophrenia is limited. The results of the present study show that they were less likely to receive olanzapine than haloperidol (odds ratio = 0.766). Although this value was not significant, the odds ratios for Mexican Americans were significant in subanalyses of the largest region (Houston), among women, and among subjects with comorbid bipolar disorder. In all instances, the direction indicated that they were less likely to receive the atypical antipsychotic versus the typical antipsychotic. Access to the newer antipsychotics appeared to improve for Mexican Americans over the study period. When the first and last 10 months of the study period were analyzed separately, Mexican American ethnicity was associated with a significantly decreased likelihood of receiving olanzapine in the first half, but was associated with a slight, nonsignificant increase in likelihood of receiving olanzapine in the second half.

Certain study limitations must be considered when interpreting these study results. Texas Medicaid patients with schizophrenia may not be representative of all patients with schizophrenia for 2 primary reasons. First, the socioeconomic status of Medicaid patients is not representative of the general population. Second, Texas Medicaid patients may not be representative of other states' Medicaid patients. Since these data were based on claims data, diagnostic codes, rather than formal diagnostic assessments, were used to identify patients with schizophrenia. In addition, there may be unmeasured sociodemographic factors that are at least partly responsible for the effect, such as differences in providers' own ethnicities or differences in their specialty training.

Suggested possible future research investigations include performing similar analyses on other ethnic patient populations such as Native Americans and Asians. Examination of gender differences may also contribute interesting information. The generalizability of these results could be bolstered if they were replicated using multi-state patient populations or study populations other than Medicaid. In addition, analyses examining the type of physician, primary care physician versus specialist, prescribing antipsychotic medications might provide a deeper understanding of differential prescribing by patient ethnicity. A study investigating whether ethnic matching of prescribers and patients affects the types of antipsychotics prescribed justifies future research attention. Lastly, the multivariate analyses performed in this study resulted in various regions of Texas being significant predictors. It may be valuable to explore this finding with targeted studies.

In conclusion, the purpose of this study was to examine ethnic differences in the prescribing of antipsychotic medication among Texas Medicaid clients with schizophrenia. Results indicated that when other factors are controlled for, ethnicity is a significant predictor of the type of antipsychotic that is prescribed. African Americans were consistently less likely than whites to receive olanzapine in all analyses. Mexican Americans were less likely than whites to receive olanzapine in specific subsets, including women, patients with comorbid bipolar disorder, patients from the largest region, and across all subjects in the first half of the study.

Drug names: clozapine (Clozaril and others), haloperidol (Haldol and others), olanzapine (Zyprexa).

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