

HEALTHCARE RESOURCE UTILIZATION AND COSTS IN PATIENTS WITH BIPOLAR DISORDER TREATED WITH LURASIDONE OR CARIPRAZINE: A RETROSPECTIVE ANALYSIS OF INSURANCE CLAIMS DATA

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KEY FINDINGS

- Patients with bipolar disorder treated with lurasidone had greater reductions in all-cause and psychiatric-related hospitalizations and hospital length of stay (LOS) from 6 months pre-treatment to 6 months post-treatment than those treated with cariprazine.
- Patients with bipolar disorder treated with lurasidone had a smaller increase in all-cause and psychiatric-related total healthcare costs than those treated with cariprazine.

INTRODUCTION

- Bipolar disorder is a chronic psychiatric mood disorder that affects approximately 2.8% of adults in the United States.¹
- The economic burden of bipolar disorder in the United States is substantial with an annual total cost estimate of over \$195 billion.²
- Lurasidone and cariprazine are the two most recently approved atypical antipsychotics for the treatment of bipolar depression and are both recommended as initial treatments for bipolar depression.³
- There are no published studies comparing lurasidone and cariprazine on healthcare resource utilization (HCRU) and costs among patients with bipolar disorder.

OBJECTIVE

- To evaluate HCRU and costs among adult patients with bipolar disorder treated with lurasidone or cariprazine.

METHODS

Data Source

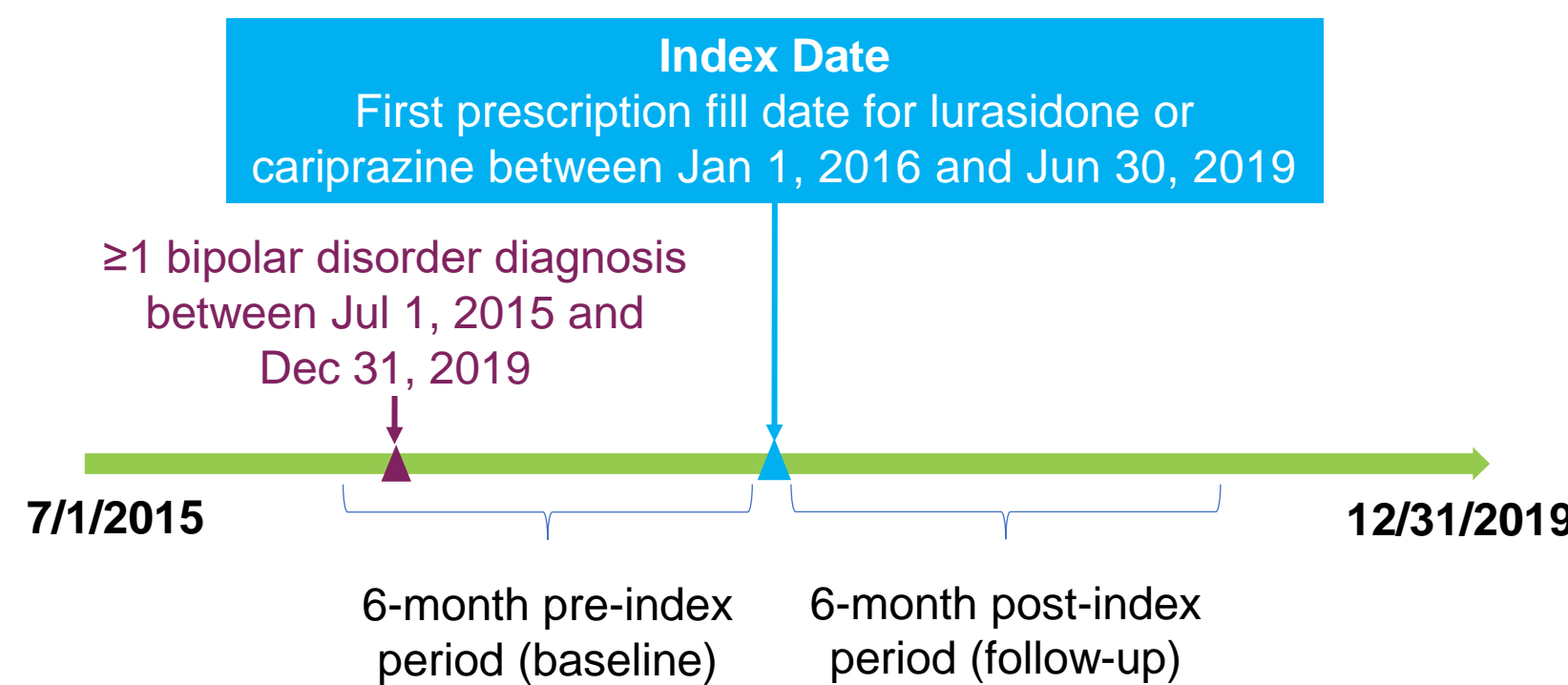
- The study utilized the IBM MarketScan® Commercial and Medicare Supplemental Database from July 1, 2015 to December 31, 2019.

- The MarketScan database includes complete medical, outpatient pharmacy, and enrollment data for over 40 million individuals annually and is representative of the commercially insured population in the US.

Study Population

- The study included adult patients with ≥1 prescription claim for lurasidone or cariprazine (index treatment) between January 1, 2016 and June 30, 2019 and ≥1 bipolar disorder diagnosis (ICD-9-CM: 296.0X, 296.1X, 296.4X, 296.5X, 296.6X, 296.7X, 296.80, 296.81, 296.89; ICD-10-CM: F30.XX, F31.0, F31.1X, F31.2, F31.3X, F31.4, F31.5, F31.6X, F31.7X, F31.89, F31.9) between July 1, 2015 and December 31, 2019.
- The first prescription fill date for lurasidone or cariprazine was defined as the index date. Patients were followed for 6 months pre- and 6 months post-index date (Figure 1).

Figure 1. Study Schematic



- Patients were continuously enrolled; did not have a diagnosis of schizophrenia during pre-index period or index date; did not have a prescription claim for lurasidone (for cariprazine cohort) or cariprazine (for lurasidone cohort) during pre-index period; and did not have a prescription claim for both lurasidone and cariprazine on index date.

Outcomes and Statistical Analyses

- All-cause and psychiatric-related HCRU and costs were calculated during the pre- and post-index periods for each cohort.
- Healthcare costs were inflated to 2019 US dollars using the annual medical care and drug costs components of the Consumer Price Index.
- A difference-in-difference (DID) analysis was conducted to compare the changes in HCRU and costs across the 6-month pre- and post-treatment periods and between the lurasidone and cariprazine cohorts.

- DID can mitigate bias related to observed and unobserved factors by using each cohort as its own control.⁴
- A propensity score weighted regression model with normalized inverse probability of treatment weighting (IPTW) was used to compare HCRU and costs between the lurasidone and cariprazine cohorts.⁵
- The regression models controlled for age, sex, geographic region, payer type, bipolar diagnosis type, comorbidities, and atypical antipsychotic use during the pre-index period.

RESULTS

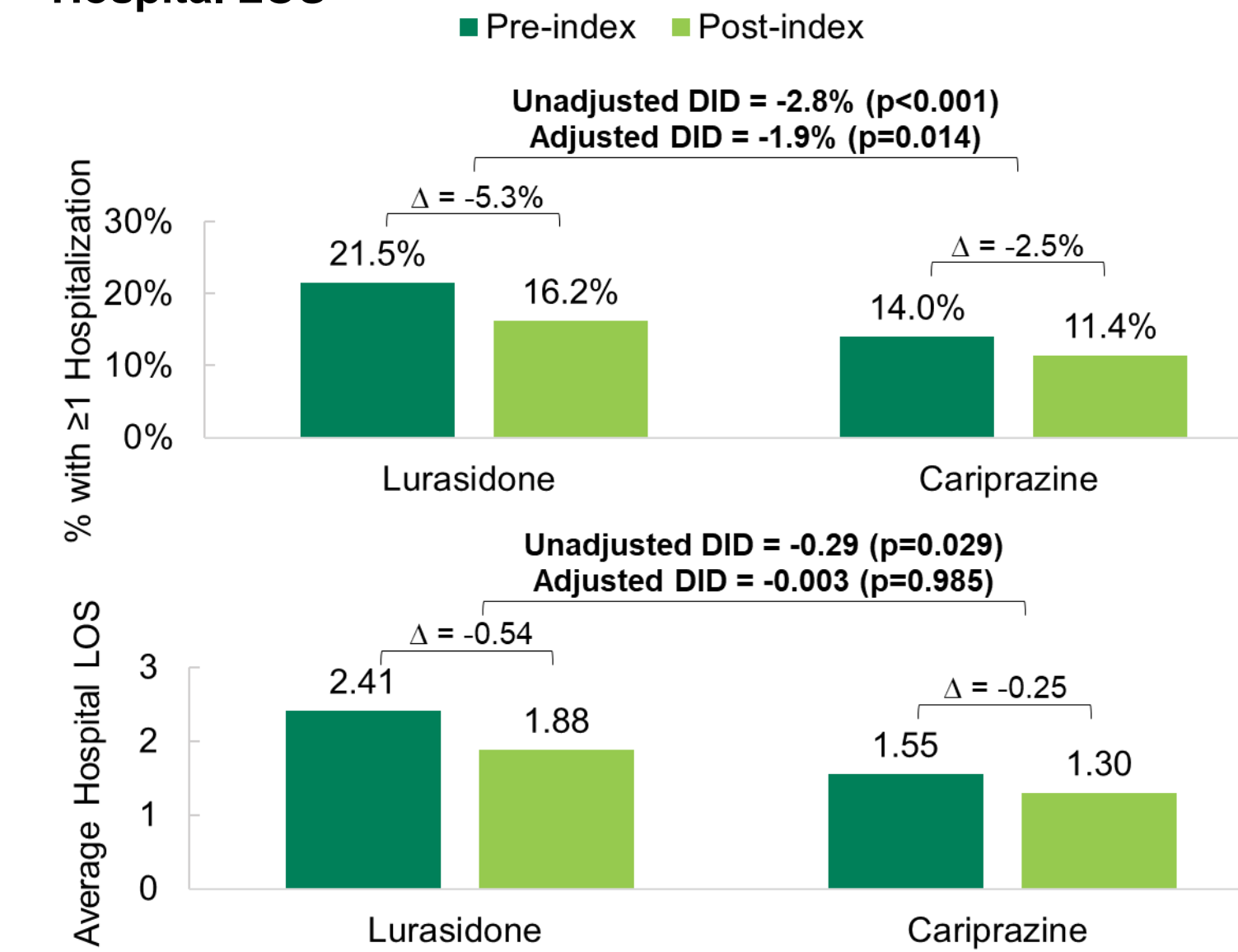
- Demographics and clinical characteristics were clinically similar across the lurasidone (N=16,683) and cariprazine (N=4,128) cohorts (Table 1).
- The proportion of patients with all-cause and psychiatric-related hospitalizations and hospital LOS decreased between baseline and follow-up in both cohorts, but the decrease was significantly greater for lurasidone vs. cariprazine (Figure 2 and Figure 3).
- The average number of overall outpatient visits increased in both cohorts, but the increase was significantly greater for lurasidone vs. cariprazine (1.94 vs. 0.87; unadjusted DID=1.07, p<0.001; adjusted DID=1.18, p<0.001).

Table 1. Demographic and Pre-Index Clinical Characteristics

Patient Characteristics	Lurasidone (N=16,683)	Cariprazine (N=4,128)	P-value
Age, mean (SD)	39.4 (14.4)	40.0 (13.6)	0.015
Female, N (%)	11,791 (70.7%)	2,818 (68.3%)	0.002
CCI Score, mean (SD)	0.5 (1.1)	0.4 (1.0)	0.238
Bipolar Diagnosis Type, N (%)			
Bipolar depression	9,306 (55.8%)	2,093 (50.7%)	<0.001
Bipolar mania	2,248 (13.5%)	674 (16.3%)	<0.001
Bipolar mixed	1,183 (7.1%)	446 (10.8%)	<0.001
Bipolar unspecified	3,946 (23.7%)	915 (22.2%)	0.043
Psychiatric Comorbidities, N (%)			
Anxiety	9,231 (55.3%)	2,371 (57.4%)	0.015
Major depressive disorder	7,526 (45.1%)	1,814 (43.9%)	0.177
Substance abuse disorders	4,196 (25.2%)	958 (23.2%)	0.010
Cardiometabolic Comorbidities, N (%)			
Hypertension	3,483 (20.9%)	896 (21.7%)	0.243
Hyperlipidemia	2,935 (17.6%)	798 (19.3%)	0.009
Obesity	2,876 (17.2%)	784 (19.0%)	0.008
Type 2 diabetes mellitus	2,282 (13.7%)	568 (13.8%)	0.892
Concomitant Medication, N (%)			
Antidepressants	11,382 (68.2%)	2,863 (69.4%)	0.162
Mood stabilizers	10,069 (60.4%)	2,495 (60.4%)	0.919
Atypical antipsychotics	9,802 (58.8%)	2,109 (51.1%)	<0.001
Anxiolytics	8,100 (48.6%)	2,197 (53.2%)	<0.001

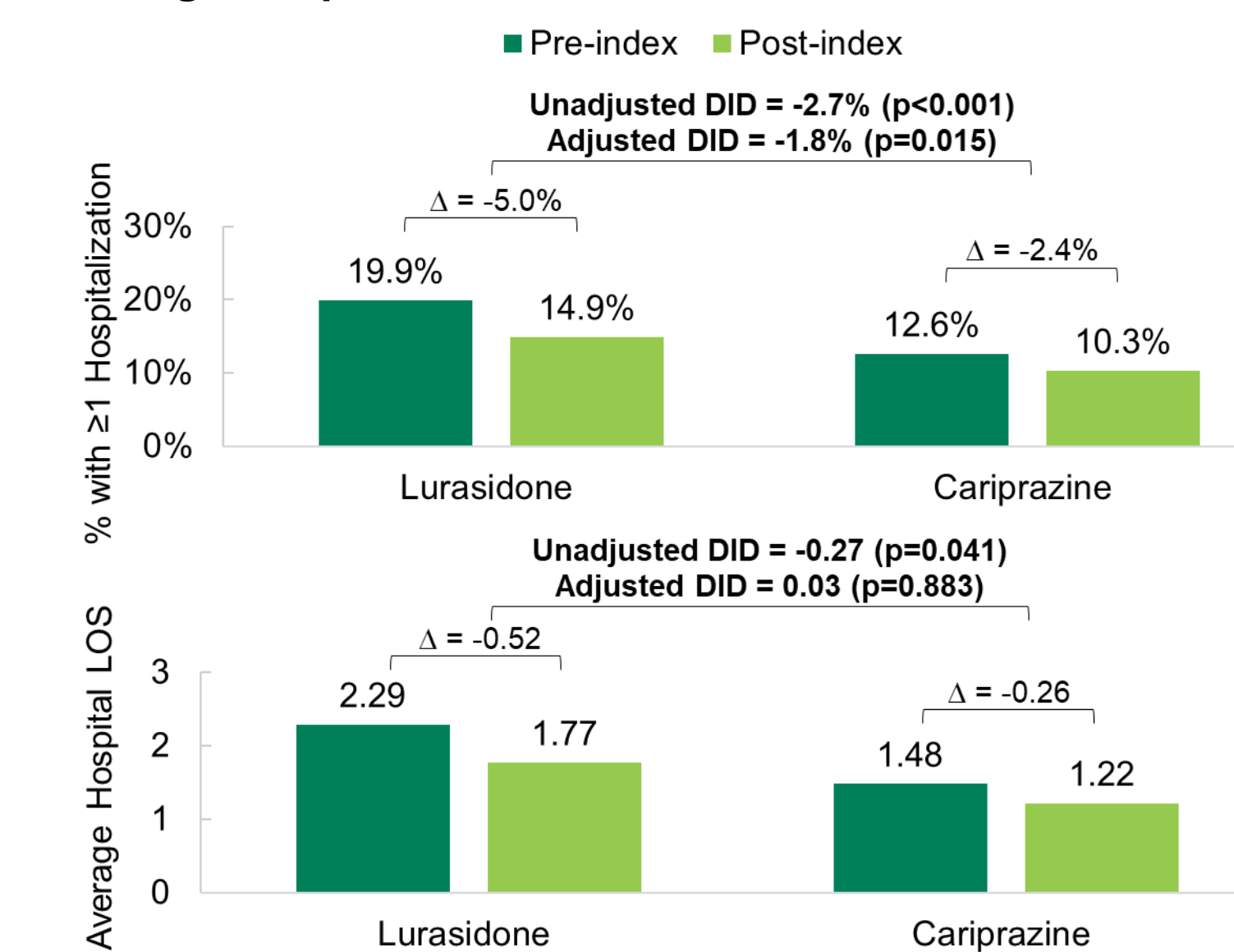
Abbreviations: N, sample size; SD, standard deviation

Figure 2. Any All-cause Hospitalizations and Average Hospital LOS



Abbreviations: DID, difference-in-difference; LOS, length of stay

Figure 3. Any Psychiatric-related Hospitalizations and Average Hospital LOS



Abbreviations: DID, difference-in-difference; LOS, length of stay

- The change in average ED visits between baseline and follow-up in both cohorts was not significantly different (-0.08 vs. -0.04; unadjusted DID=-0.04, p=0.094; adjusted DID=-0.01, p=0.685).
- Total costs increased for both cohorts, but the increase was lower in the lurasidone cohort (adjusted, all-cause DID=-\$1,183) (Table 2).

- The difference in the increases in total costs was primarily driven by the greater reduction in hospital costs (adjusted, all-cause DID=-\$848). Patients in the lurasidone cohort also had greater increases in outpatient costs and smaller increases in pharmacy costs.

Table 2. Average All-cause and Psychiatric-related Healthcare Costs

Costs, mean	Lurasidone Cohort			Cariprazine Cohort			Unadjusted		Adjusted	
	Pre-index	Post-index	Pre-post diff.	Pre-index	Post-index	Pre-post diff.	DID	p-value	DID	p-value
All-cause										
Inpatient	\$5,041	\$3,989	-\$1,052	\$3,397	\$3,253	-\$144	-\$907	0.033	-\$848	0.057
Outpatient	\$6,734	\$7,160	\$426	\$6,132	\$6,193	\$61	\$365	0.174	\$335	0.278
ED	\$796	\$700	-\$96	\$678	\$622	-\$57	-\$39	0.392	-\$11	0.839
Office	\$746	\$790	\$43	\$759	\$761	\$3	\$41	0.002	\$46	<0.001
Other outpatient	\$5,192	\$5,670	\$478	\$4,695	\$4,810	\$115	\$363	0.158	\$299	0.312
Pharmacy	\$3,369	\$7,408	\$4,039	\$2,903	\$7,628	\$4,725	-\$685	<0.001	-\$670	<0.001
Total	\$15,143	\$18,557	\$3,413	\$12,432	\$17,074	\$4,642	-\$1,228	0.022	-\$1,183	0.038
Psychiatric-related										
Inpatient	\$3,776	\$2,831	-\$945	\$2,335	\$2,160	-\$175	-\$770	0.002	-\$618	0.030
Outpatient	\$3,180	\$3,701	\$522	\$2,794	\$3,033	\$238	\$283	0.073	\$205	0.264
ED	\$378	\$277	-\$100	\$398	\$255	-\$144	\$43	0.134	\$53	0.105
Office	\$346	\$428	\$82	\$295	\$407	\$112	-\$30	0.274	-\$14	0.672
Other outpatient	\$2,456	\$2,996	\$540	\$2,101	\$2,370	\$270	\$270	0.077	\$166	0.350
Pharmacy	\$1,687	\$5,581	\$3,894	\$892	\$5,345	\$4,453	-\$559	<0.001	-\$546	<0.001
Total	\$8,643	\$12,114	\$3,471	\$6,021	\$10,538	\$4,517	-\$1,046	<0.001	-\$959	0.007

Abbreviations: DID, difference-in-difference; diff., difference; ED, emergency department; m, month
 Notes: Other outpatient includes all other outpatient visits. Highlighted cells indicate significant differences at p<0.05

LIMITATIONS

- Administrative claims are collected for billing purposes, so there is potential for miscoding. Additionally, claims do not capture all relevant clinical severity data, so disease severity could not be completely controlled for. However, the DID design can mitigate bias by using each cohort as its own control.
- The dataset is representative of commercially insured individuals, and results may not be generalizable to the uninsured and Medicaid populations.

DISCLOSURES

H. Huang was an employee of Sunovion at the time of this work. Q. Fan, C. Dembek, and G.R. Williams are employees of Sunovion. L. Schmerold and C. Dieyi are employees of STATinMED Research, which received funding from Sunovion to conduct this analysis.

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