

# All-cause Inpatient Hospitalizations in Medicaid Patients with Dual Diagnoses of Schizophrenia and Bipolar Disorder who Initiated Long-Acting Injectable Antipsychotics

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## Introduction

- Schizophrenia affects approximately 1.1% or 2.7 million adults in the United States (US).<sup>1</sup>
- Approximately 0.3% of the US population has schizoaffective disorder,<sup>2</sup> the co-occurrence of schizophrenia and a mood disorder (major depressive or bipolar disorder).<sup>3</sup>
- Existing research has demonstrated the superiority of long-acting injectable antipsychotics (LAIs) over oral antipsychotics in preventing hospitalizations, a proxy for relapse, among patients with schizophrenia.<sup>4,5</sup>
- The literature on clinical effectiveness and economic impact of selecting one LAI versus another is scarce,<sup>6,7</sup> and existing studies have not included schizophrenia patients with comorbid bipolar disorder.

## Objective

To compare all-cause inpatient hospitalizations among Medicaid patients with dual diagnoses of schizophrenia and bipolar disorder who initiated long-acting injectable antipsychotics (LAIs).

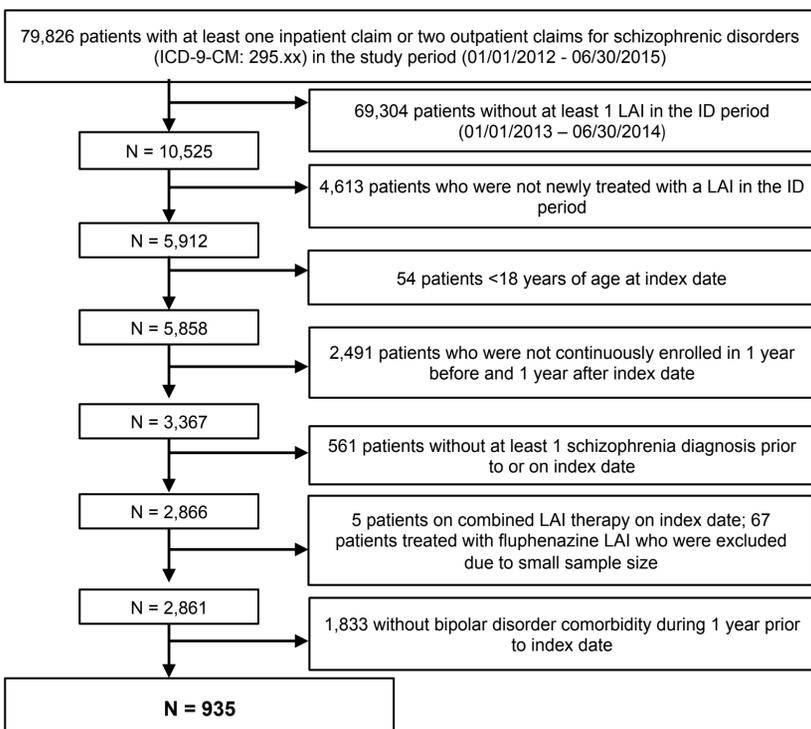
## Methods

- Retrospective cohort study using Truven MarketScan® Medicaid Database
- Patient identification
  - Schizophrenia patients (≥1 inpatient claim or 2 outpatient claims with ICD-9-CM code: 295.xx) during the study period between 01/01/2012 and 6/30/2015
  - LAI cohorts
    - At least one claim for one of the following LAIs and
    - Initiated one of the following LAIs during the ID period (01/01/2013 - 06/30/2014):
      - aripiprazole, haloperidol, paliperidone, risperidone
    - Index date: first LAI use
    - No index LAI use 1 year prior to the index date (change from different LAI was allowed)
  - Dual diagnoses: schizophrenia patients had bipolar disorder within one year prior to the index date
  - Patients followed for variable period until disenrollment or study end
  - Additional inclusion criteria
    - Schizophrenia diagnosis before index date
    - 1-year pre- and post-index continuous enrollment
  - Exclusion criteria:
    - ≤17 years old on index date
- Outcome measures
  - All-cause inpatient hospitalization rates in 1-year post-index period
  - Time to first all-cause hospitalization during entire follow-up period
- Statistical analyses
  - Kaplan-Meier curve to estimate time to first all-cause hospitalization
  - Logistic regression and Cox regression models to estimate adjusted all-cause inpatient hospitalization rate and risk of inpatient hospitalization
  - Models adjusted for patient demographic and clinical characteristics, baseline medication use, and baseline emergency department (ED) visits or hospitalizations

## Results

- Of 935 identified LAI users with dual diagnoses of schizophrenia and bipolar disorder (Figure 1), 49.3% received paliperidone, 23.3% haloperidol, 16.4% risperidone, and 11.0% aripiprazole (Table 1).
- The mean (SD) age of the overall population was 37.2 (12.6) years old. More than 48% of the patients were female, and approximately 44% were African Americans (Table 1).
- Adjusted post-index 1-year hospitalization rate in aripiprazole (36.8%) was lower than in paliperidone (41.9%), haloperidol (45.6%), and risperidone (47.3%), but the differences were not statistically significant ( $p > 0.05$ ) (Table 2).
- Median time to first all-cause hospitalization in aripiprazole was 647 days, compared with 507 days in paliperidone, 426 days in haloperidol, and 419 days in risperidone LAI cohorts ( $p = 0.422$ ) (Figure 2).

Figure 1. Patient Identification



**Disclosures:** Greene is an employee of Otsuka Pharmaceutical Development & Commercialization, Inc., Princeton, NJ. Yan, Chang, and Broder are employees of Partnership for Health Analytic research, LLC, Beverly Hills, CA. Hartry is an employee of Lundbeck, Deerfield, IL. Funding for the study and this poster was received from Otsuka Pharmaceutical Development and Commercialization, Inc. and Lundbeck.

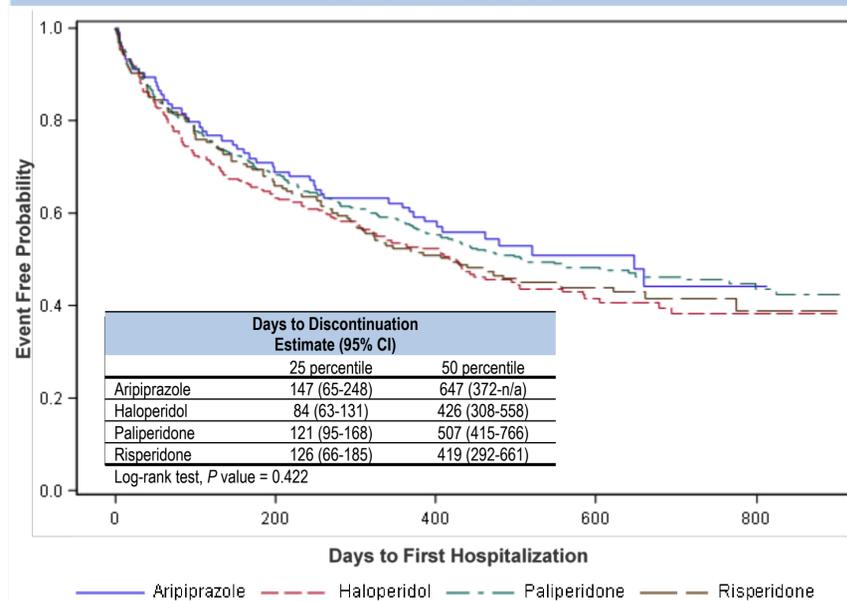
## Results (cont'd)

Table 1. Patient Characteristics

	Paliperidone N = 461; 49.3%	Haloperidol N = 218; 23.3%	Risperidone N = 153; 16.4%	Aripiprazole N = 103; 11.0%	All N = 935	P Value
<b>Demographics</b>						
Age, year, mean (SD)	36.1 (12.3)	38.1 (12.5)	40.0 (13.2)	36.4 (12.7)	37.2 (12.6)	0.006
Female, n (%)	210 (45.6)	107 (49.1)	80 (52.3)	56 (54.4)	453 (48.4)	0.269
<b>Race, n (%)</b>						
White	178 (38.6)	69 (31.7)	61 (39.9)	59 (57.3)	367 (39.3)	0.001
Black	205 (44.5)	104 (47.7)	68 (44.4)	37 (35.9)	414 (44.3)	
Other	78 (16.9)	45 (20.6)	24 (15.7)	7 (6.8)	154 (16.5)	
<b>Comorbidities</b>						
CCI <sup>a</sup> , mean (SD)	1.2 (1.8)	1.5 (2.2)	1.7 (2.3)	1.5 (2.1)	1.4 (2.0)	0.014
No. chronic conditions <sup>b</sup> , mean (SD)	4.1 (2.3)	4.4 (2.4)	4.7 (2.5)	4.7 (2.3)	4.3 (2.4)	0.011
<b>Psychiatric comorbidities, n (%)</b>						
Depression	278 (60.3)	148 (67.9)	95 (62.1)	59 (57.3)	580 (62.0)	0.191
Anxiety	249 (54.0)	106 (48.6)	72 (47.1)	59 (57.3)	486 (52.0)	0.222
Personality disorder	108 (23.4)	57 (26.1)	39 (25.5)	31 (30.1)	235 (25.1)	0.534
Substance abuse disorders	323 (70.1)	146 (67.0)	94 (61.4)	65 (63.1)	628 (67.2)	0.187
<b>Somatic comorbidities<sup>c</sup>, n (%)</b>						
Obesity	277 (60.1)	137 (62.8)	99 (64.7)	73 (70.9)	586 (62.7)	0.208
<b>Baseline healthcare service use</b>						
Any inpatient hospitalization or ED visits, n (%)	402 (87.2)	196 (89.9)	126 (82.4)	80 (77.7)	804 (86.0)	0.012

<sup>a</sup>Charlson Comorbidity Index. <sup>b</sup>Agency for Healthcare Research and Quality. HCUP Chronic Condition Indicator. *Healthcare Cost and Utilization Project (HCUP)* [Internet]. 2015. Available from: [www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp](http://www.hcup-us.ahrq.gov/toolssoftware/chronic/chronic.jsp). <sup>c</sup>Obesity, diabetes mellitus, hyperlipidemia, hypertension

Figure 2. Time to First All-cause Hospitalization during the Entire Post-index Period



- With aripiprazole as the reference group, the risk of having all-cause inpatient hospitalizations during the entire follow-up was higher in haloperidol, paliperidone and risperidone cohorts, although differences were not statistically significant ( $p > 0.05$ ) (Table 2).

Table 2. Adjusted<sup>a</sup> Inpatient Hospitalization

LAI	All-cause Inpatient Hospitalization in 1-year Follow-up Period <sup>b</sup> (N = 935)		Risk of All-cause Inpatient Hospitalization in Entire Follow-up Period <sup>c</sup> (N = 935)	
	Adjusted Rate (95% CI)	P Value <sup>d</sup>	Adjusted HR (95% CI)	P Value
Aripiprazole	36.8% (27.5% - 47.3%)	--	Ref.	--
Haloperidol	45.6% (38.7% - 52.6%)	0.169	1.20 (0.86 - 1.68)	0.284
Paliperidone	41.9% (37.2% - 46.8%)	0.377	1.10 (0.81 - 1.50)	0.554
Risperidone	47.3% (39.0% - 55.7%)	0.124	1.17 (0.83 - 1.67)	0.369

<sup>a</sup>Adjusted for age groups, gender, race (White vs. non-White), CCI, number of chronic conditions, any baseline inpatient hospitalization or ED visit, depression, anxiety, any use baseline psychiatric medication use, and any baseline somatic medication use. <sup>b</sup>Logistic regression model. <sup>c</sup>Cox regression model. <sup>d</sup>Compared to aripiprazole.

## Limitations

- Schizophrenia and bipolar disorder were identified in healthcare claims, which are designed for reimbursement, not research.
- Some risk factors for relapse in schizophrenia and bipolar disorder, such as duration of illness, are not recorded in claims.
- Results may not be generalizable to non-Medicaid patient populations.
- The ability to detect statistical significance is limited due to small sample size.
- The LAIs aripiprazole lauroxil and paliperidone palmitate were not included in the analysis as their approval dates were beyond the study end date; olanzapine pamoate was excluded due to small sample size.

## Conclusions

- To our knowledge, this study is the first attempt to compare LAIs on their ability to reduce inpatient hospitalizations among Medicaid patients with dual diagnoses of schizophrenia and bipolar disorder.
- Patients treated with aripiprazole LAI have a numerically lower risk of being hospitalized compared with those treated with haloperidol, paliperidone, and risperidone LAIs, although the differences were not statistically significant.

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