Healthcare Utilization and Cost in Schizophrenia and Bipolar Disorder: Real-world Evidence from US Claims Databases

Mallik Greene, BPharm, PhD, DBA[1]; Jessie Tingjian Yan, PhD[2]; Eunice Chang, PhD[2]; Ann Hartry, PhD[3]; Maëlys Touya, PharmD[3]; Jennifer Munday, PhD, MPH[2]; Michael S. Broder, MD, MSHS[2]

[1] Otsuka Pharmaceutical Development & Commercialization, Inc., Princeton, NJ, USA; [2] Partnership for Health Analytic Research, LLC, Beverly Hills, CA, USA; [3] Lundbeck, Deerfield, IL, USA

Background

- Schizophrenia (SCZ) and bipolar disorder (BD) are typically viewed as separate and non-concurrent psychiatric disorders clinically and in the Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Classification of Diseases (ICD) classification systems; but patients may experience both mood and schizophrenia symptoms simultaneously and be diagnosed with both disorders.[1,2]
- Several studies have shown overlap between SCZ and BD symptoms, leading to diagnostic confusion, and molecular studies have confirmed that schizophrenia and BD share susceptibility genes.[3-5]
- This study aimed to explore healthcare resource utilization (HCRU) and costs in patients with claims-based diagnoses of SCZ, type 1 BD (BD-I), and both in a real-world setting.

Methods

- Retrospective cohort study using the Truven Health MarketScan® Medicaid, Commercial, and Medicare Supplemental Databases
- Patient identification:
  - SCZ: ≥1 inpatient or ≥2 outpatient claim between 01/01/2012 and 06/30/2016; BD-I defined analogously
  - SCZ alone
    - New episode with SCZ (e.g., met the claims-based diagnostic criteria for SCZ, but not for BD-I)
    - Index date: first diagnosis date of schizophrenia within study period
  - BD-I alone
    - New episode with BD-I (e.g., met the claims-based diagnostic criteria for BD-I, but not for SCZ)
    - Index date: first episode of BD-I within study period
  - Both SCZ and BD-I
    - New episodes with both SCZ and BD-I (e.g., met the claims-based diagnostic criteria for both SCZ and BD-I)
    - Index date: first diagnosis date of either SCZ or BD-I
  - Additional requirements
    - ≥18 years on index date
    - 1-year pre-index (baseline) continuous enrollment
    - 1-year post-index continuous enrollment
  - Exclusion criteria
    - Had any medical claims for SCZ or BD-I in the 1-year prior to their first diagnosis date for either condition found in the study ID period (01/01/2013-06/30/2015)
    - Due to incomplete date, for Medicaid enrollees: Medicare and Medicaid dual eligible patient and patients with capitated insurance plans were excluded; and those who lacked pharmacy or mental health coverage during entire study period were excluded
- Healthcare utilization over 1-year follow-up period (all-cause and psychiatric with primary diagnosis of any mental disorder [ICD-9-CM code: 290.xx-311.xx; ICD-10-CM code: F01.xx-F99.xx]) measured as numbers of:
  - Office visits, inpatient hospitalizations, and ED visits
- Healthcare costs over 1-year follow-up period (all-cause and psychiatric) calculated by adding up payments received in inpatient, outpatient and pharmacy settings
- Statistical analysis:
  - Descriptive statistics including means, standard deviations, and relative frequencies and percentages for continuous and categorical data reported for all cohorts; costs adjusted to 2016 US$
  - Chi-square for categorical variables, t-tests for normally-distributed continuous variables, and Kruskal-Wallis tests for non-normally distributed variables were performed
  - A sensitivity analysis stratified by schizoaffective disorder status was also performed

Results

- Of the 63,725 patients in the final sample, 11.5% had SCZ alone, 80.8% had BD-I alone, and 7.7% had a diagnosis of both SCZ and BD-I based on claims **(See Figure 1)**
  - Among patients with both SCZ and BD-I based on claims,18.9% (n=927) received both on the same day, with the majority [83.4% (n=773)] given in hospital/ED settings
- In the year following diagnosis, the group having a claims-based diagnosis of both SCZ and BD-I had the highest all-cause hospitalization rates
  - 67.4% versus 39.5% in SCZ alone and 33.7% in BD-I alone (all p<0.001)
- In the year following diagnosis, the group having a claims-based diagnosis of both SCZ and BD-I had the highest all-cause emergency department visit rates
  - 65.1% versus 44.8% in SCZ alone and 43.2% in BD-I alone
- All-cause total healthcare costs were highest in the group having a diagnosis of both SCZ and BD-I based on claims [mean (SD): $51,085 (62,759)], followed by the SCZ alone group [$34,204 (52,995)], and the BD-I alone group [$26,393 (48,294)]
  - All-cause total healthcare costs were highest in the group having a claims-based diagnosis of both SCZ and BD-I for patients with (n=2,243, mean $58,082) and without (n=2,666, mean $45,199) schizoaffective disorder when compared to the SCZ alone group (with: n=1,967, mean $39,751; without: n=5,369, mean $32,172) and BD-I alone group (with: n=1,806, mean $38,867; without: n=49,674, mean $25,942)

Figure 1. Patients with Schizophrenia Alone, Bipolar Type I Disorder Alone, and Claims for Both

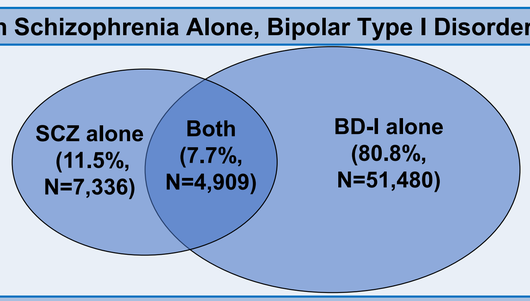
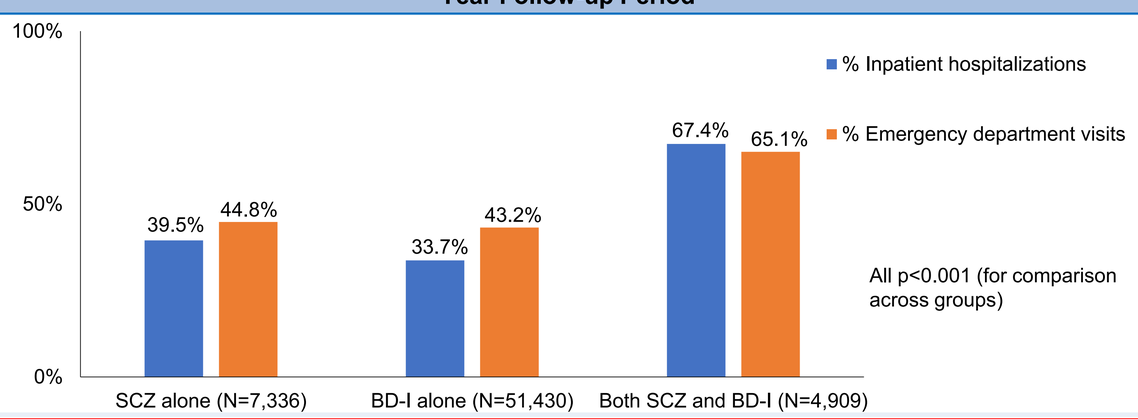


Figure 2a. Unadjusted All-Cause Hospitalization and Emergency Department Visit Rates During the 1-Year Follow-up Period



Results (continued)

Table 1. Baseline[d] Patient Characteristics

	SCZ alone N=7,336; 11.5%	BD-I alone N=51,480; 80.8%	Both N=4,909; 7.7%	P Value[a]
Age in years, mean (SD)	46.6 (17.3)	41.6 (16.2)	41.8 (15.5)	<.001
Female, n (%)	3,381 (46.1)	32,948 (64.0)	2,686 (54.7)	<.001
Race, n (%)				<.001
White	1,320 (18.0)	7,397 (14.4)	1,468 (29.9)	
African American	2,711 (37.0)	3,033 (5.9)	1,195 (24.3)	
Other	711 (9.7)	1,950 (3.8)	652 (13.3)	
Unknown (Commercial/Medicare supplemental)	2,594 (35.4)	39,100 (76.0)	1,594 (32.5)	
Insurance Type, n (%)				<.001
Medicaid	4,742 (64.6)	12,380 (24.0)	3,315 (67.5)	
Commercial	1,771 (24.1)	35,172 (68.3)	1,270 (25.9)	
Medicare supplemental	823 (11.2)	3,928 (7.6)	324 (6.6)	
Comorbidities				
Charlson comorbidity index, mean (SD)	1.1 (1.9)	0.9 (1.6)	1.4 (2.0)	<.001
No. chronic conditions, mean (SD)	3.1 (2.5)	3.2 (2.3)	4.1 (2.5)	<.001
Psychiatric comorbidities[b], n (%)	2,659 (36.2)	28,514 (55.4)	3,211 (65.4)	<.001
Somatic comorbidities[c], n (%)	3,585 (48.9)	22,284 (43.3)	2,845 (58.0)	<.001
Baseline[d] medication and healthcare service use				
Psychiatric medications[e], n (%)	3,892 (53.1)	38,071 (74.0)	3,842 (78.3)	<.001
Antipsychotic use, n (%)	4,073 (55.5)	16,330 (31.7)	3,743 (76.2)	<.001
Somatic medications[f], n (%)	3,142 (42.8)	20,997 (40.8)	2,448 (49.9)	<.001
Any hospitalization, n (%)	1,316 (17.9)	9,366 (18.2)	2,230 (45.4)	<.001

[a] Difference among the overall cohorts
[b] Major depressant disorders, anxiety, personality disorder, substance abuse disorders
[c] Obesity, diabetes mellitus Type 2, hyperlipidemia, hypertension
[d] One year prior to the index date
[e] Antidepressant, anti-anxiety medications, sedatives or hypnotics, mood stabilizer
[f] Antidiabetic medications, lipid-lowering medications, anti-hypertensive medications

Figure 2b. Unadjusted Mean Number of All-Cause Office Visits During the 1-Year Follow-up Period

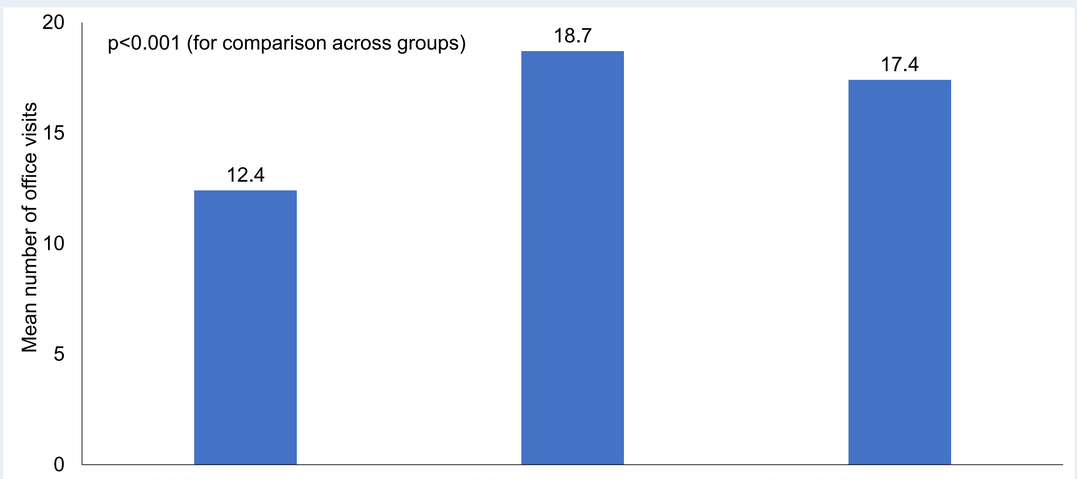
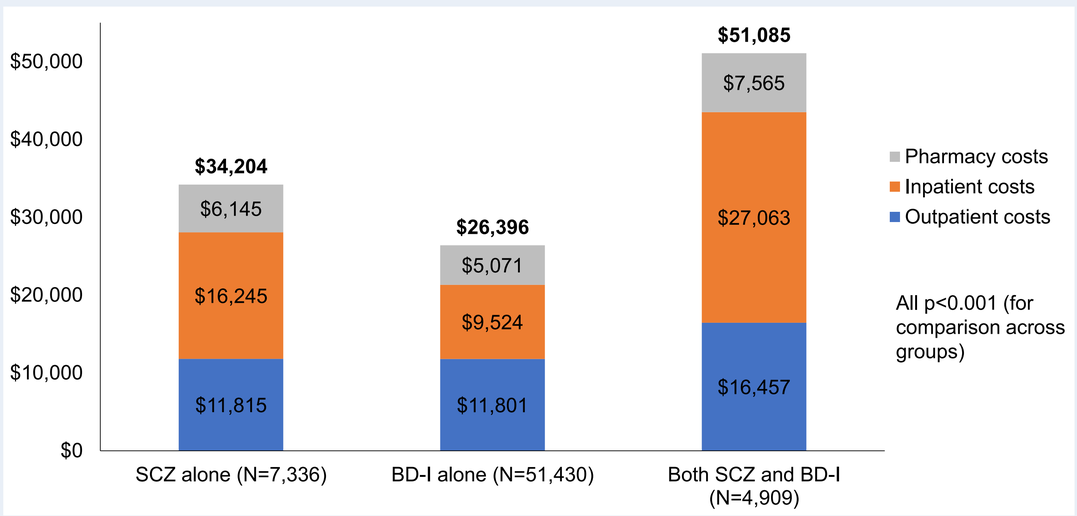


Figure 3. All-Cause Mean Healthcare Costs During the 1-Year Follow-up Period (adjusted to 2016 US$)



Discussion

- Despite the fact that schizophrenia and bipolar disorder are separate psychiatric disorders, when examining a large nationally representative sample, we found evidence of diagnostic uncertainty, as almost 8% of the full group of patients received both diagnosis based on claims. This was especially common among patients with a SCZ diagnosis, as 40% of these patients also had a BD-I diagnosis.
- Patients with a claims-based diagnosis of both SCZ and BD-I had higher HCRU and costs than patients with either diagnosis alone. Similar results were found in the sensitivity analysis.
- This study took the first steps to investigate these heterogenous groups.
- Limitations of the study
  - Claims were generated for reimbursement, not research purposes, so misclassification, diagnostic uncertainty, and/or omissions could affect the reliability of findings.
  - Diagnosing physician's specialty information was only available in about 10% of the claims, not making it easily accessible.

References

1. Laursen TM, et al. *J Clin Psychiatry*. 2009. DOI: 10.4088/JCP.08m04807.
2. Pandarakalam, James P. *Prog Neurol Psychiatry*. 2008. DOI: 10.1002/pnp.83.
3. Fountoulakis KN, et al. *Psychiatr Danub*. 2017. PMID: 28636572.
4. Jones PB, et al. *Eur Arch Psychiatry Clin Neurosci*. 2000. DOI: 10.1007/s004060070003.
5. Bramon E, et al. *Curr Psychiatry Rep*. 2001. DOI: 10.1007/s11920-001-0030-1.

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

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