RWD8

Clinical Characteristics of Patients with Agitation Episodes Associated with Bipolar Disorder or Schizophrenia – Real World Patient Journey

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50% of patients had an **ED** or **inpatient visit** associated with an agitation episode

41% of patients had **all-cause hospital visits** within **30 days**

Positive correlation between **average agitation episodes per year per patient** and **hospital readmission (0.48)** and **mortality risk (0.65)**

$51.5B **yearly hospitalization costs** associated with agitation episodes

INTRODUCTION

- Agitation is common among patients with bipolar disorder (BPD) and/or schizophrenia (SCZ)[1,2]
- A systematic review in the UK associated agitation with longer inpatient stays, higher readmission rates, and increased medication consumption[3]
- Additionally, per a recent Spanish economic analysis, agitation contributes significantly to hospital costs[4,5]
- US-based studies using real world data on agitation associated with SCZ or BPD are lacking

OBJECTIVE

- Describe the real-world journey of patients with agitation associated with SCZ or BDP
- Identify potential areas of improvement to improve outcomes and minimize costs

METHODS

Patient Cohort Identification

- Patients with BPD or SCZ with ≥1 acute agitation episode were identified by International Classification of Diseases (ICD) codes[a] using Clarivate Real World Data between 9/3/2015 - 4/29/2022
  - Patients with 1 diagnosis claim for each an agitation episode and BPD/SCZ
  - Patients with agitation but not BPD/SCZ if at least 1 agitation episode but no claims for BPD/SCZ
- Data collected: demographics, clinical characteristics, settings of care, and hospital visits
- The Elixhauser Comorbidity Categorization (via python hcuppy) was used to identify 30 pre-existing conditions based on ICD9/10 diagnosis codes (ie, comorbidities) at the time of agitation episode[6]

Mortality Risk and Hospital Readmission Risk

- Mortality and 30-day all-cause readmission risk were calculated with Elixhauser methodology[7,8]
- Each separate, composite risk score was based on the 30 individual comorbidity measures

30-day All-cause Hospital Visits

- 30-day all-cause hospital visits were quantified using medical claims 30 days after a hospital agitation event
- Hospital visits were identified using medical claims place of service designation, including inpatient and emergency department (ED) visits

Patient Journey Analysis

- Exhaustive psychiatric patient history assigned a singular pre-/post- agitation event location based on highest frequency of inpatient claim, using psychiatric treatments (including all pharmaceutical therapies for nervous system listed in the Anatomical Therapeutic Chemical classification system)[9] and medical claims (all ICD-10 codes starting with F)[10] during 1 year pre- and post-agitation episode
- Hospitalization costs were estimated using published BPD/SCZ institutional agitation episodes estimates and weighted cost estimates from the healthcare cost and utilization project (HCUP) adjusted for inflation (**Table 1**)

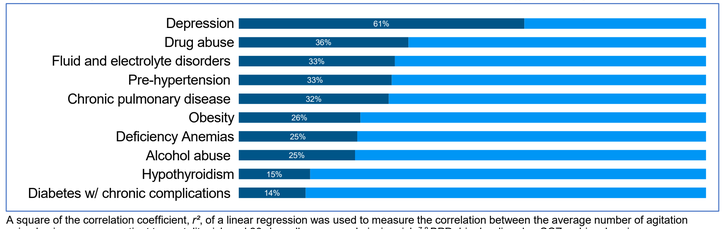
[a]ICD9/10 codes were used to identify BPD (ICD10: F30, F31, F34.0; ICD9:296.0-296.8), SZD (ICD10: F20, F11, F25; ICD9: 295, 301.2), and agitation (ICD10: R45.0, R45.1, R45.4, R45.5, R45.6, R45.87, R46.3, R46.7, F43.8; ICD9: 799.21-799.23) events.

RESULTS

Patient Clinical Characteristics

- 650,539 patients identified with BPD and/or SCZ and at least 1 agitation episode:
  - 46% identified as female and 54% identified as male
  - Most were adults <65 years of age: 48% 18 - 44 years, 14% 45 - 54 years, and 15% 55 - 64 years
  - Payer Segmentation: 51% commercial, 22% Medicaid, 15% Medicare
  - Top comorbidities: depression (61%) drug abuse (36%), fluid and electrolyte disorders (33%), prehypertension (33%), chronic pulmonary disease (32%) (**Figure 1**)

Figure 1. Top 10 Comorbidities Among Patients with BPD/SCZ-related Agitation Episodes



A square of the correlation coefficient, r^2, of a linear regression was used to measure the correlation between the average number of agitation episodes in a year per patient to mortality risk and 30-day, all cause-readmission risk.[7,8] BPD, bipolar disorder; SCZ, schizophrenia.

Hospital Readmission, Mortality, and 30-day Hospital Revisits

- Correlation between average agitation episodes per patient per year and hospital readmission risk (0.48) (**Figure 2**) and mortality risk (0.65) (**Figure 3**)
- All-cause hospital revisit within 30 days occurred in 20% of all patients without BPD/SCZ identified with an agitation episode and 41% of patients with BPD/SCZ with an agitation episode (**Figure 4**)

Figure 2. Correlation of Agitation Episodes with Hospital Readmission

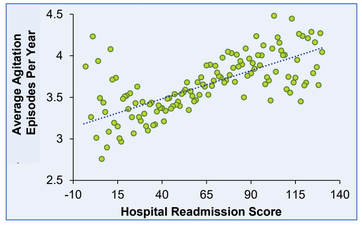
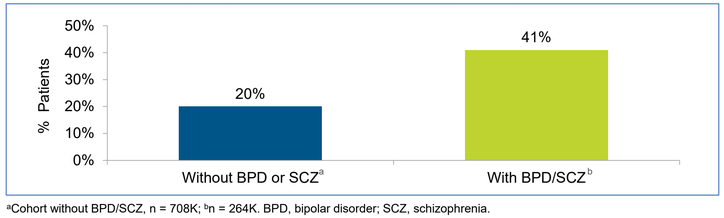


Figure 3. Correlation of Agitation Episodes with Mortality

Figure 4. All-cause 30-day Hospital Revisits in Patients with Agitation Episodes

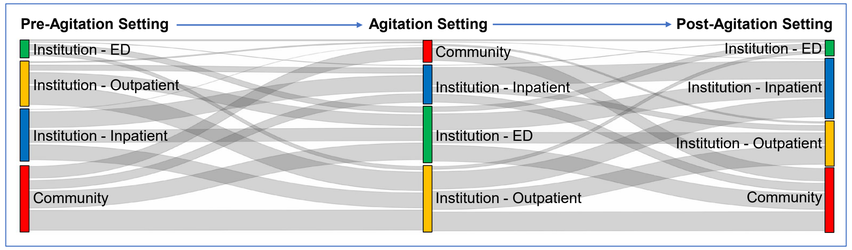


[a]Cohort without BPD/SCZ, n = 708K; [b]n = 264K. BPD, bipolar disorder; SCZ, schizophrenia.

Patient Journey Through Sites of Care

- Patients flow through >10 different pathways across sites of care before, during, and after agitation episodes (**Figure 5**)
  - Although the path of community setting to outpatient setting and back to community is common, many other paths occur
  - 50% with BPD/SCZ and agitation episodes flowed through either the ED (22%) or inpatient setting (28%) (**Table 1**)

Figure 5. Patient with BPD/SCZ Flow Through Sites of Care Before and After Agitation Episodes



A singular *location* was assigned to each agitation episode; in cases where multiple locations were identified, a singular location was assigned based on the highest frequency location *during* the assessment period. ED, emergency department; BPD, bipolar disorder; SCZ, schizophrenia.

Hospitalization Costs

- Adjusting for inflation, the 2023 average cost per psychiatric stay for BPD/SCZ was $10,855 ($9,283 in 2020)[12] and cost of an ED visit for BPD/SCZ was $849 ($726 in 2020)[13] (**Table 1**)
- Hospitalization costs associated with agitation episodes in BPD/SCZ are estimated to be $51.5B yearly (**Table 1**)

Table 1. Hospitalization Costs

BPD / SCZ institutional agitation annual episodes[9, 11]	16,000,000	
	Inpatient	ED
Visits	28%	22%
Average cost per stay in 2023 dollars[a]	$10,855	$849
Estimated Cost (yearly)	$48.6 billion	$2.9 billion

[a]Reported costs extracted from HCUP: Nationwide Inpatient Sample (NIS) 2020 $9,283;[12] Nationwide Emergency Department Sample 2020 $726.[13] , BPD, bipolar disorder; ED, emergency department; HCPU, healthcare cost and utilization project; SCZ, schizophrenia.

DISCUSSION AND CONCLUSIONS

- Clarivate Real World Data (>6 years) of patients with agitation episodes associated with BPD or SCZ
- Prevalence of agitation among BPD and SCZ patients is consistent with published data showing that most patients with BPD/SCZ are adults under 65 years old[9,14]
- Data confirmed the expected high frequency of depression and substance abuse comorbidities.[15-17]
- In this dataset, 50% of those with agitation associated with BPD or SCZ were treated in the ED or inpatient setting, after onset of agitation symptoms in outpatient or home settings, where management options for agitation are limited
- Positive correlation between average agitation episodes per year per patient and hospital readmission risk and mortality risk
- This costs hospitals an estimated $51.5B annually in potentially avoidable agitation-related ED and inpatient costs
- These results strongly suggest timely agitation intervention could prevent costly hospital stays and improve patient outcomes by reducing hospital readmission risk

Limitations

- The percentage of Medicaid patients is lower than previous literature; Clarivate Real World Data is biased towards commercially insured patients due to being sourced from switch clearing houses
- These findings are subject to the generalizability limitations that exist in Clarivate Real World Data, namely that dataset might under-represent the population with agitation events and that it includes years impacted by the COVID-19 pandemic

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