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Hospitalizations and emergency room visits after initiation of long-acting injectable antipsychotics

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Abstract

Introduction: Long-acting injectable antipsychotics (LAIs) serve as a means to ensure medication adherence with the intention of improving outcomes for psychiatric patients. Evidence remains inconclusive regarding the impact of LAIs on relapses and psychiatric hospitalizations rates.

Methods: The primary objective of this retrospective pre/post study was to determine whether initiating an LAI in a veteran population with schizophrenia, schizoaffective disorder, or bipolar disorder is associated with a decrease in the 1-year rate of psychiatric hospitalizations and emergency room (ER) visits.

Results: For the combined primary endpoint, the 1-year rate of psychiatric hospitalizations and ER visits for patients with schizophrenia, schizoaffective disorder, or bipolar disorder was not significantly reduced after initiation of LAIs (n = 50, median [interquartile range]: 1.5 [1, 3] to 1 [0, 3], $P = .055$). However, the secondary endpoint of the 1-year rate of psychiatric hospitalizations was reduced (1 [0, 3] to 0 [0, 2], $P = .026$). Additionally, for those who received injections on a regular basis, the 1-year rate of hospitalizations and ER visits was significantly reduced (2 [1, 3] to 0 [0, 1.5], $P = .009$).

Discussion: This retrospective study suggests that the initiation of LAIs is associated with a reduced rate of psychiatric hospitalizations as well as a reduced rate of psychiatric hospitalizations and ER visits for those patients who receive injections on a regular basis.

Keywords: veterans, retrospective, antipsychotic agents, delayed-action preparations, injections, treatment outcome, hospitalization, emergency department visits, schizophrenia, psychotic disorders, bipolar disorder

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Introduction

Patient adherence to oral antipsychotics (OAPs) is far from adequate as nonadherence has been reported to be as high as 50% in patients with schizophrenia spectrum disorders and bipolar disorder.[1-3] Nonadherence is associated with increased relapses, hospitalization rates, and emergency room (ER) visits.[4-7] Long-acting injectable antipsychotics (LAIs) are often utilized to improve long-

term adherence.[8] All of the LAIs are approved by the US Food and Drug Administration for use in schizophrenia, whereas risperidone LAI has an additional approval for use in bipolar disorder and paliperidone palmitate has an additional approval for schizoaffective disorder in both bipolar and depressive types.[9-12] Treatment guidelines for schizophrenia spectrum disorders recommend using LAIs in those patients who prefer the injectable depot route of administration, in those patients who are nonadherent, or when avoiding nonadherence is desired.[13-15] The Veterans Health Administration/Department of Defense Clinical Practice Guideline for Management of Bipolar Disorder in Adults recommends using LAIs for those patients with frequent relapses, and the Canadian Network for Mood and Anxiety Treatments/International Society for Bipolar Disorders guideline update recommends risperidone LAI as a first-line option for maintenance therapy in bipolar disorder.[3,7] Despite the perceived advantages, there are also disadvantages of using LAIs, including acquisition cost, long-lasting adverse effects, injection-related adverse effects, and limited ability to rapidly adjust the dose.[8]

More than 65% of patients with schizophrenia spectrum disorders have not been offered an LAI, and only about 20% of patients are treated with an LAI, according to a survey of 300 patients in Germany.[16] The main reason for not prescribing LAIs is assumed adherence with OAPs.[17] Additionally, clinicians typically reserve LAIs for the most ill patients as opposed to using LAIs in those patients who are nonadherent; furthermore, some clinicians find LAIs to be old-fashioned and stigmatizing.[17,18] Clinic staff may also have negative attitudes toward using LAIs, which may be due to their limited time for injection administration.[18] However, many clinicians also believe that LAIs are part of a patient-centered approach to treatment and that the benefits often outweigh the risks.[19] Additionally, a study found that 54% of patients prefer LAIs as it is easier for them to have an injection every 2 to 4 weeks than to take a pill once or multiple times daily; furthermore, 43% of patients with schizophrenia believed LAIs provide superior protection against relapse, 35% desired the lower total drug dose compared with OAP treatment, 33% believed using the LAI would improve the relationship with their doctor, and 40% would potentially accept a depot injection.[16]

It is essential to increase adherence to antipsychotic medications and decrease relapses and rehospitalizations in patients with schizophrenia spectrum disorders and bipolar disorder. Evidence is conflicting regarding benefits of using LAIs; some studies report decreases in hospitalization rates, relapses, or a longer time to relapse or in remission, whereas other studies failed to find a significant benefit of LAIs compared with OAPs.[20-29] It is important to understand how LAIs affect health care utilization and ensure that intended outcomes are achieved. The primary objective of this retrospective pre/post study was to compare the 1-year rate of psychiatric hospitalization and ER visits for patients with schizophrenia, schizoaffective disorder, or bipolar disorder before and after initiation of an LAI at the South Texas Veterans Health Care System (STVHCS).

Methods

Inclusion and Exclusion Criteria

Prior to initiating this study, full institutional review board and STVHCS research and development approval was obtained. This was a retrospective pre/post study, which utilized the electronic medical records of STVHCS from July 1, 2008, to June 30, 2013. Patients were identified by STVHCS surveillance system if prescribed an LAI between July 1, 2009, and June 30, 2012. Only those patients who were dispensed a new prescription for an LAI between July 1, 2009, and June 30, 2012, were included in the study. Those patients who initiated an LAI outside STVHCS or whose care was transitioned outside STVHCS during the first year after initiation of the LAI were excluded. Additionally, patients whose medical records were not available for 1 year prior to initiation of LAI and for 1 year after initiation of LAI were excluded. Patients who did not receive the injection or whose first injection date could not be determined were also excluded. Those patients without a diagnosis of schizophrenia, schizoaffective disorder, or bipolar disorder as identified by chart review and/or International Classification of Diseases, 9th Edition (ICD-9) code were excluded. Use of OAPs was not an exclusion criterion for this study.

Data Collected

Patient information collected from the electronic medical record included age at time of initiation of LAI, gender, rural or urban geographic location at time of data collection, global assessment of functioning score (most recent score within 6 months prior to initiation of LAI), presence of a personality disorder or traits as noted by psychiatry notes or ICD-9 codes at the time of injection or prior to initiation of LAI, ethnicity, enrollment in the Mental Health Intensive Case Management program at any point during the 2-year data collection period, and mental health diagnoses as noted by psychiatry notes or ICD-9 codes at the time of initiation of LAI or prior to LAI initiation. Medication-related information collected from the chart included name of LAI received, number of LAI injections received during the 1-year chart review, prescribed time interval between injections, regular or sporadic use of LAI, the mean days late or early the patient received the LAI, and the name of OAPs prescribed if prescribed for more than 6 months of the

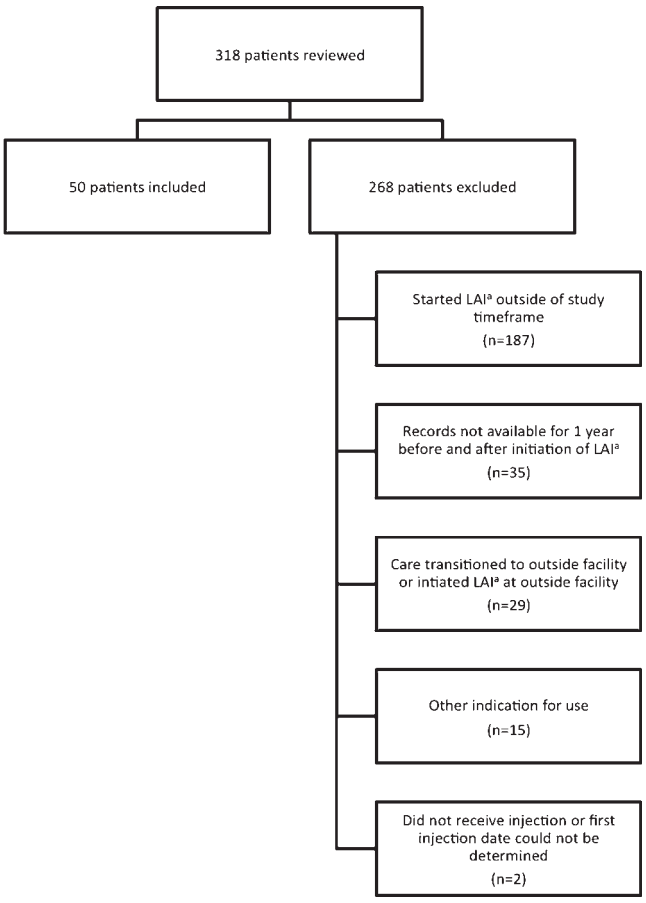

FIGURE: Flow chart summarizing the distribution of patients throughout the study of hospitalizations and emergency room visits after initiation of LAIs
[a]**Long-acting injectable antipsychotic (LAI).**

year after initiation of the LAI. If the LAI was changed to another LAI during the 1-year follow-up, then the name of the LAI to which the patient was switched was also recorded. Other information collected during the year prior to initiation and the year after initiation included number of psychiatric hospitalizations, number of psychiatric ER visits, and number of no-show appointments. The time to first psychiatric hospitalization and time covered by LAI measured in days was also recorded.

Outcomes

The primary aim of this study was to determine whether the use of an LAI is associated with a decreased rate of psychiatric hospitalizations and ER visits as a combined endpoint. Secondary aims included analyzing the rate of hospitalizations and the rate of ER visits separately, as well as, characterizing no-show appointments. Additionally, the association of medication regimen (use of OAPs), geographic location, and adherence was to be investigated. The time from initiation of an LAI to initial psychiatric hospitalization and time to discontinuation of an LAI for each agent was to be described.

The 1-year rate of psychiatric hospitalizations and ER visits was defined as the number of psychiatric hospitalizations and psychiatric ER visits during the evaluated time period. An ER visit that led to a psychiatric hospitalization was counted solely as a hospitalization. Patients were classified as using OAPs in combination with LAIs when the OAP was prescribed concurrently with an LAI for at least 6 months. Patients were classified as receiving the injections regularly (regular use) if each injection was administered within 6 weeks after the previous injection. Patients were classified as receiving injections sporadically (sporadic use) if 1 or more injections were administered 6 or more weeks after the previous. The mean number of days late receiving LAIs was calculated using LAI dates of injections and prescribed interval between injections. The time covered by LAIs was used to characterize time to discontinuation and was calculated by adding the dosing interval in days to the days from first injection to the last injection.

Statistical Analyses

Descriptive statistics were used to analyze demographic data, where baseline characteristics are presented using means $\pm$ SDs for continuous variables. The primary endpoint and secondary endpoints that compare the 1-year pre/post data were analyzed using a paired Wilcoxon signed rank test for non-normally distributed data (median, interquartile range). Descriptive statistics were used to analyze the time to initial hospitalization and time to discontinuation of an LAI. A post hoc power analysis was to be performed in the event that no statistically significant difference was found for the primary endpoint.

Results

Patient and Medication Use Characteristics

Of the 318 total charts reviewed, 50 met the inclusion criteria (Figure). Patients included in the study were a mean age of 48 years, 76% male, 78% of white race, 82% of urban residence, and 48% enrolled in mental health intensive case management (Table 1). The majority had a diagnosis of schizophrenia (26%) or schizoaffective disorder (46%). Most of the patients received risperidone LAI (50%) or paliperidone palmitate (28%); only 22% utilized first-generation LAIs (Table 2). Twenty percent of patients switched from their originally prescribed injection to paliperidone palmitate or haloperidol decanoate during the first year after starting an LAI. Forty-four percent of patients were prescribed an OAP in combination with an LAI; oral risperidone was the most frequently prescribed. Sixty-six percent of patients received their injection later than the date it was due on average over the course of the 1-year follow-up (3.1 $\pm$ 3.0 days).

TABLE 1: Patient characteristics

Characteristic	Subjects (n = 50)
Age (years), mean ± SD	48 ± 13
Male gender, n (%)	38 (76)
Global assessment of functioning,[a] mean ± SD	43 ± 10
Race, n (%)	
White	39 (78)
Black	6 (12)
Unknown	4 (8)
Asian or Pacific Islander	1 (2)
Urban residence, n (%)	41 (82)
Rural residence, n (%)	9 (18)
Mental health intensive case management, n (%)	24 (48)
Indication for use of long-acting injectable antipsychotic, n (%)	
Schizophrenia	13 (26)
Schizoaffective disorder	23 (46)
Bipolar disorder	14 (28)
Personality disorder, n (%)	10 (20)
Comorbid psychiatric disorders, n (%)	30 (60)
One other psychiatric condition	15 (30)
Two other psychiatric conditions	15 (30)
Post-traumatic stress disorder	12 (24)
Substance dependence	11 (22)
Nondependent abuse of drugs	7 (14)
Anxiety, dissociative, and somatoform disorders	5 (10)
Persistent mental disorders due to conditions classified elsewhere	4 (8)
Depressive disorder, not elsewhere classified	3 (6)
Dementias	1 (2)
Sexual and gender identity disorders	1 (2)

[a]N = 49 because one global assessment of functioning score was not recorded in the medical record.

Psychiatric Hospitalizations, ER Visits, and No-Show Appointments

There was no significant reduction in the combined endpoint of the 1-year rate of psychiatric hospitalizations and ER visits after initiation of an LAI (Table 3; 1.5 [1, 3] to 1 [0, 3], $P = .055$). A post hoc power analysis for the primary endpoint determined that with 50 patients, the study had a power of 65%, indicating a risk of type II error of 35%. There was a statistically significant reduction in the 1-year rate of psychiatric hospitalizations after initiation of an LAI (1 [0, 3] to 0 [0, 2], $P = .026$). There was no significant reduction in psychiatric ER visits (0 [0, 1] to 0 [0, 1], $P = .563$) or no-show appointments (1.5 [0, 4] to 1.5 [1, 3], $P = .811$).

TABLE 2: Medication use characteristics

Characteristic	n (%) (n = 50)
LAI	
Risperidone LAI	25 (50)
Paliperidone palmitate	14 (28)
Haloperidol decanoate	7 (14)
Fluphenazine decanoate	4 (8)
Switched to alternative LAI	10 (20)
Switched to paliperidone palmitate	9 (18)
Switched to haloperidol decanoate	1 (2)
Compliance	
Regular use	36 (72)
Sporadic use[a]	14 (28)
Oral antipsychotic in combination with LAI[b]	22 (44)
Risperidone	14 (28)
Quetiapine	2 (4)
Fluphenazine	2 (4)
Ziprasidone	1 (2)
Olanzapine	1 (2)
Haloperidol	1 (2)
Perphenazine	1 (2)

LAI = long-acting injectable antipsychotic.

[a]Of the subjects, 4% received only 1 LAI injection.

[b]Oral antipsychotic prescribed in combination with LAI for at least 6 months.

Subgroup Analysis

There was a significant reduction in the 1-year rate of psychiatric hospitalizations and ER visits in the 28 patients who received an LAI without an OAP (Table 4; 2 [1, 4] to 1 [0, 3.5], $P = .047$); however no significant reduction was found for the 22 patients prescribed an LAI in combination with an OAP (1 [0, 3] to 1 [0, 2], $P = .696$). There was also a significant reduction in the 1-year rate of psychiatric hospitalizations and ER visits for the 36 patients who received injections on a regular basis (2 [1, 3] to 0 [0, 1.5], $P = .009$), but there was no significant reduction for the 14 patients who received injections sporadically (1 [1, 4] to 2.5 [0, 6], $P = .744$). There was no significant reduction in the 1-year rate of psychiatric hospitalizations and ER visits for the 41 patients residing in urban locations (2 [1, 3] to 1 [0, 2], $P = .053$) or for the 9 patients in rural locations (1 [1, 1] to 0 [0, 7], $P = .516$).

Time to First Psychiatric Hospitalization and Time Covered by LAI

Seven of 11 patients (64%) who received first-generation LAIs and 15 of 39 patients (38%) who received second-generation LAIs were hospitalized the year after starting LAI (Table 5). There was a significantly longer time to first psychiatric hospitalization for those patients receiving

TABLE 3: Median (interquartile range) 1-year rate of psychiatric hospitalizations, ER visits, and no-show appointments

Outcome	1-Year Rate Pre-LAI Initiation (n = 50)	1-Year Rate Post-LAI Initiation (n = 50)	*P* Value
Hospitalizations and ER visits	1.5 (1, 3)	1 (0, 3)	.055
Hospitalizations	1 (0, 3)	0 (0, 2)	.026
ER visits	0 (0, 1)	0 (0, 1)	.563
No-show appointments	1.5 (0, 4)	1.5 (1, 3)	.811

ER = emergency room; LAI = long-acting injectable.

second-generation LAIs compared with first-generation LAIs (163 ± 107 versus 89 ± 60 days, respectively; $P < .001$). Five of 11 patients (45%) who received first-generation LAIs and 30 of 39 patients (77%) who received second-generation LAIs stopped receiving injections prior to 1 year after initiation. There was a significantly longer time covered by LAI for those who received first-generation LAIs compared with those who received second-generation LAIs (259 ± 150 versus 206 ± 131 days, respectively; $P < .001$).

Discussion

In this retrospective pre/post study of veterans, there was no statistically significant association between the initiation of LAIs and a reduction in the 1-year rate of psychiatric hospitalizations and ER visits for the combined primary endpoint. However, the primary endpoint was limited by a high risk for type II error. Despite the high rate of discontinuation of LAI prior to 1 year, the initiation of LAIs was associated with a reduction in the 1-year rate of psychiatric hospitalizations, and specific subgroups of patients also appeared to benefit from the initiation of LAIs. It is likely that the use of OAPs during and/or after discontinuing LAIs influenced these outcomes; the reason for discontinuation is not known as that information was not collected. For those patients who received the injections on a regular basis, the 1-year rate of psychiatric hospitalizations and ER visits was reduced. Also, those patients who received LAIs without OAPs had a reduction in the 1-year rate of psychiatric hospitalizations and ER visits. Those patients who received second-generation LAIs had a longer time to first psychiatric hospitalization than those who received first-generation LAIs. However, this does not correlate with the finding that those who received second-generation LAIs discontinued treatment sooner than those who received first-generation LAIs.

Several studies and meta-analyses have analyzed similar outcomes of LAIs. In a 2-year, open-label, randomized, controlled study of 666 patients with schizophrenia or schizoaffective disorder who were stable on regimens of oral risperidone, olanzapine, or first-generation antipsychotics and then switched to risperidone LAI or oral quetiapine, those randomized to risperidone LAI had a longer time to relapse compared with those randomized to oral quetiapine (log-rank test: $P < .001$).[20] A study by Conley et al[21] compared the 1-year readmission rates for patients with schizophrenia who were prescribed second-generation OAPs with those prescribed first-generation LAIs. This study found a significantly lower rate of readmission for those using second-generation OAPs (10% for clozapine [n = 41], 12% for risperidone [n = 149], and 13% for olanzapine [n = 103]) compared with haloperidol decanoate (n = 59, 35%, $P < .05$) and no significant difference compared with fluphenazine decanoate (n = 59, 21%, $P > .05$).

In comparison, an open-label, randomized study of 349 patients with schizophrenia found no significant difference between use of risperidone LAI and oral aripiprazole in the

TABLE 4: Subgroup analyses of median (interquartile range) 1-year rate of psychiatric hospitalization and ER visits

Hospitalizations and ER Visits	n	1-Year Rate Pre-LAI Initiation	1-Year Rate Post-LAI Initiation	*P* Value
LAI alone	28	2 (1, 4)	1 (0, 3.5)	.047
Oral antipsychotic in combination with LAI	22	1 (0, 3)	1 (0, 2)	.696
Regular use	36	2 (1, 3)	0 (0, 1.5)	.009
Sporadic use	14	1 (1, 4)	2.5 (0, 6)	.744
Urban residence	41	2 (1, 3)	1 (0, 2)	.053
Rural residence	9	1 (1, 1)	0 (0, 7)	.516

ER = emergency room; LAI = long-acting injectable antipsychotic.

TABLE 5: Time to first psychiatric hospitalization and time covered by LAI measured as frequency (percent) and mean ± SD

	First-Generation LAIs (n = 11)	Haloperidol Decanoate (n = 7)	Fluphenazine Decanoate (n = 4)	Second-Generation LAI (n = 39)	Risperidone LAI (n = 25)	Paliperidone Palmitate (n = 14)
Hospitalized 1-year after initiation of LAI, n (%)	7 (64)	4 (57)	3 (75)	15 (38)	9 (36)	6 (43)
Time to first hospitalization (days), n (%)	89 ± 60[a]	64 ± 67	122 ± 36	163 ± 107[a]	119 ± 111	230 ± 58
Stopped receiving LAI prior to 1 year, n (%)	5 (45)	3 (43)	2 (50)	30 (77)	21 (84)	9 (64)
Time covered by LAI (days), n (%)	259 ± 150[a]	252 ± 194	271 ± 122	206 ± 131[a]	185 ± 126	254 ± 138

LAI = long-acting injectable antipsychotic.

[a]First-generation LAIs compared with second-generation LAIs, $P < .001$.

time to relapse (25% quartile: 131 versus 113 days, respectively, $P = .685$) or time to remission (374 versus 357 days, respectively, $P = .646$).[22] In a 2-year randomized controlled study of 369 veterans with schizophrenia spectrum disorders, the use of risperidone LAI did not significantly reduce hospitalization rates compared with clinician's choice of an OAP (39% after 10.8 months versus 45% after 11.3 months, respectively; hazard ratio 0.87; 95% confidence interval [CI] 0.63-1.20).[23]

Several meta-analyses have recently been conducted to evaluate the outcomes of LAIs compared with OAPs and found contradictory conclusions. A meta-analysis of 58 studies (randomized or observational) reporting hospitalization rates before and after initiation of LAIs and OAPs concluded that LAIs reduced hospitalization rates more than OAPs (56% versus 36%, $P = .023$); however, no significant difference between LAIs and OAPs was found for the absolute rate of hospitalization during follow-up after initiation of the LAI (random effects estimate: −8.6, 95% CI −18.1-1.0, $P = .077$).[24] Another meta-analysis evaluated the effects of OAPs compared with LAIs in mirror-image studies, which compared the use of OAPs versus LAIs in the same patients in order to evaluate the real-world impact of LAIs.[25] Across 25 studies of 5940 patients with schizophrenia, the authors found that LAIs were superior to OAPs in preventing hospitalization (N = 16, n = 4066; risk ratio 0.43, 95% CI 0.35-0.53; $P < .001$) and decreased the number of hospitalizations (N = 15, 6342 person years; rate ratio 0.38, 95% CI 0.28-0.51; $P < .001$). Leucht and colleagues[26] conducted a meta-analysis of 10 randomized controlled studies of 12 months or greater in duration in more than 1700 outpatients with schizophrenia spectrum disorders to compare OAPs and LAIs. The authors concluded that LAIs significantly reduced study-defined relapses compared with OAPs (relative risk [RR] 0.7, 95% CI 0.57-0.87; $P = .0009$). In contrast, a meta-analysis concluded that study-defined relapse at the longest time point was similar between LAIs and OAPs in 21 randomized, controlled trials of 4950 patients with schizophrenia spectrum disorders (RR 0.93, 95% CI 0.8-1.08; $P = .35$).[27]

One reason results may vary between studies is differing methodology and study design. A recent review suggests that those studies that utilized randomized controlled designs have found LAIs and OAPs to have similar benefits, whereas studies that utilized mirror-image design or cohort studies typically find LAIs to be superior to OAPs in relapse prevention.[28] A meta-analysis conducted to evaluate relapse, hospitalization, or all-cause discontinuation found no significant advantage of LAIs compared with OAPs across randomized controlled studies (N = 6, RR 0.89, $P = .416$); however, LAIs were found to be advantageous in prospective studies (N = 5, RR 0.62, $P < .001$) and retrospective studies (N = 8, RR 0.56, $P < .001$).[29]

This study has several limitations. This retrospective pre/post study does not allow for the formulation of direct cause-and-effect conclusions. Perhaps the largest limitation was that the study was not powered adequately for the primary endpoint. Additionally, the study only included psychiatric hospitalizations and ER visits at STVHCS. Unfortunately, it was not possible to accurately capture hospitalizations and ER visits outside STVHCS. The dates of injections prior to 2010 and no-show appointments were not documented in the medical record in a consistent manner, which may have lead to inaccurate data collection. Geographic location at the time of LAI use could not be determined. Therefore, geographic designation was based on zip code in the medical record at the time of data collection; thus, patients may have lived in a different zip code at the time in which the LAI was initiated, which would lead to inaccurate determination of urban and rural residence. Many patients switched to paliperidone palmitate as it was added to the formulary during the study inclusion dates, and it is unclear how

switching LAIs may have affected the results. Additionally, the definition of sporadic use utilized a cutoff of 6 or more weeks between injections despite the fact that the prescribed administration frequencies varies between 2 and 4 weeks among LAIs. As it was anticipated that patients would switch injections during the study period, 6 weeks was chosen to encompass a long enough time frame to cover all injections utilized in the study. Therefore those patients who received LAIs every 2 weeks could still have been classified as "regular users" even if they missed every other injection.

Several limitations specifically limit the generalizability of the study findings: this study did not compare adherence with OAPs prior to initiation of the LAI to LAI adherence; a majority of the patients in the study were prescribed second-generation LAIs rather than first-generation LAIs; doses of OAPs and LAIs were not evaluated; baseline characteristics, such as duration of illness, previous antipsychotic trials, and total number of psychiatric hospitalizations were not characterized; and the study population comprised veterans, of which a majority were men.

Another limitation of the study is the high exclusion rate (84%). A majority of the patients were excluded because the timeframe for initiation of LAI was limited. However, medical record information that was not available for the duration of data collection as well as transitioning care outside of STVHCS were also high reasons for exclusion. Due to the large exclusion rate, selection bias may have been introduced into the study, and the 16% of patients included in the study may not be representative of the veteran population at STVHCS. This study did not compare costs of medications and costs of hospitalizations. For further research it would be useful to compare the yearly cost of LAIs, OAPs, hospitalizations, and ER visits. To reduce numerous limitations found in this study, future research should consist of a prospective cohort study that encompasses a larger patient population with adequate power.

Although the present study has many limitations, it adds information to the medical literature. The current literature is limited by contradictory and inconclusive evidence regarding the benefits of LAIs. This study characterizes the actual outcomes of the use of LAIs in a veterans health system from 2008 to 2013. The results of this study may be useful to other Veterans Affairs facilities with similar patient populations and medication use characteristics.

Conclusions

In this retrospective pre/post study of veterans prescribed LAIs for schizophrenia, schizoaffective disorder, or bipolar disorder, there was no significant reduction in the combined primary endpoint of the 1-year rate of psychiatric hospitalizations and ER visits. Certain subgroups of patients benefited from initiation of LAIs. For those patients utilizing LAIs without OAPs and for those who regularly received injections, initiation of an LAI was associated with a reduction in psychiatric hospitalizations and ER visits. Additionally, initiation of an LAI was associated with a reduction in the secondary endpoint, the 1-year rate of psychiatric hospitalizations. Despite previous inconclusive and contradictory evidence, initiation of LAIs in this study of veterans appeared to be beneficial.

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