Long-Acting Injectable Versus Oral Antipsychotics for Restoration of Competency to Stand Trial

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Treatment with antipsychotics is a mainstay of trial competency restoration, particularly given that most defendants deemed incompetent to stand trial have psychotic illnesses. We explored the association between competency restoration and antipsychotic type in a retrospective sample of defendants diagnosed with psychotic disorders and deemed incompetent to stand trial. Using regression models, we calculated the odds ratio of being competent to stand trial, adjusting for relevant confounders. We found that the use of long-acting injectable antipsychotics was not significantly associated with increased odds of restoration of trial competency. Our results highlight the need for larger, longitudinal studies to further explore the efficacy and tolerability of long-acting injectable drugs compared with oral antipsychotics. Future research will help develop treatment guidelines within the setting of trial competency restoration.

J Am Acad Psychiatry Law 47(4) online, 2019. DOI:10.29158/JAAPL.003866-19

State and federal standards for competency to stand trial are largely uniform: defendants who, due to a mental illness, are unable to understand proceedings against them or unable to assist in their own defense are deemed incompetent to stand trial (IST).[1] Some have estimated that up to 60,000 competency evaluations are conducted annually, and up to 30 percent of those evaluated are deemed IST.[1] Defendants deemed IST form the largest forensic population in need of treatment.[2] In a recent meta-analysis, defendants with psychosis were found to be eight times more likely to be adjudicated IST than nonpsychotic defendants.[3]

Restoration of competency to stand trial is defined as "the process of applying psychiatric and/or psychological treatment to those symptoms identified as barriers to a defendant's ability to legally proceed through the system" (Ref. 2, p 257). Treatment locations vary depending on jurisdictions and include jails, hospitals, and community settings.[2] According to one study, 80 to 90 percent of incompetent defendants are successfully restored and deemed competent to stand trial (CST) within six months[4]; only a small subset of IST defendants fail restoration of competency and are found to be nonrestorable, also called permanently incompetent to stand trial (PIST).[4] Predictors of failure of restoration include older age, long history of mental illness, diagnoses of psychosis or intellectual delay, and having misdemeanor charges.[4]

Although there is no accepted standard for restoration of competency, pharmacotherapy with antipsychotics is typically an essential component.[2] Atypical antipsychotics are usually considered to be first-line treatment of acute schizophrenia, and clozapine is specifically recommended for treatment-resistant schizophrenia.[5] Whereas both oral and injectable formulations are more effective than placebo in managing symptoms of schizophrenia, long-acting injectable antipsychotics (LAI) may have a slight edge with regard to reducing rehospitalization rates, promoting treatment adherence, and reducing treatment costs.[6–8]

Published online September 18, 2019.

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Disclosures of financial or other potential conflicts of interest: None.

Research examining the differential effect of types of antipsychotic treatment on restoration of competency is limited. One study found that CST and PIST defendants had similar scores on the Brief Psychiatric Rating Scale at baseline, and that CST defendants' scores and symptoms decreased with treatment, whereas those of PIST defendants did not.[9] Another study found that delay in medication initiation was significantly associated with restoration failure.[10] To our knowledge, however, there are no studies examining the association between the class of antipsychotics or their form of administration and successful restoration to competency. In this study, we explored the association between regaining trial competency and the form and class of antipsychotics used for treatment in a sample of IST defendants diagnosed with psychotic disorders. We expected that the use of atypical antipsychotics and LAI would be associated with a higher likelihood of successful restoration to competency.

Methods

Data Source

We performed a retrospective chart review study of defendants hospitalized at the Metropolitan Saint Louis Psychiatric Center (MSLPC) for restoration of competency to stand trial. We reviewed the charts of inpatients aged 18 years or older at the time of admission who were admitted and discharged between July 2011 and June 2017. All inpatients had been deemed IST and court-ordered to MSLPC for restoration of competency. We only included the first admission record of individuals who had several stays at MSLPC. We excluded records of patients who were deemed CST by the facility's forensic examiners but were later adjudicated PIST, or vice versa. We also excluded the records of individuals who died or eloped while in treatment.

We retrieved from each record the main psychiatric discharge diagnosis using the classification as given in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5).[11] We selected our psychosis sample based on two criteria: the main discharge diagnosis fell under the category schizophrenia spectrum and other psychotic disorders,[11] and antipsychotic medications were prescribed. Our study was approved by the institutional review board of Saint Louis University and the protocol review committee of Missouri's Department of Mental Health. All data were de-identified.

Measures

Our dependent variable was dichotomous, indicating whether a patient was found CST or PIST on the basis of the opinion of MSLPC's forensic examiners and the court ruling. We designed three independent variables based on the antipsychotic treatment prescribed to the patients throughout their stay. The first variable, formulation, dichotomized antipsychotics based on the following two categories: oral only and LAI $\pm$ oral. The second variable, class, categorized antipsychotics as typical (e.g., chlorpromazine, fluphenazine, and haloperidol), atypical (e.g., aripiprazole, clozapine, lurasidone, olanzapine, paliperidone, quetiapine, risperidone, and ziprasidone), or both. The third variable, formulation $\times$ class, measured the interaction of formulation by class and had six distinct categories: typical oral, atypical oral, both oral, typical LAI $\pm$ oral, atypical LAI $\pm$ oral, and both LAI $\pm$ oral.

We also calculated for each record the time to decision (i.e., the number of days between date of admission and date of the written opinion) and the length of stay (i.e., the number of days between date of admission and date of discharge). We extracted the following information: age at admission; sex; race/ethnicity; type of charges (e.g., felony, misdemeanor or both); number of antipsychotics used; whether patients were discharged on antipsychotics, mood stabilizers, or antidepressants; and whether patients had prior psychiatric treatment.

Statistical Analysis

We first compared the sociodemographic, legal, and clinical variables between the CST and PIST groups in the total sample. We then compared these variables between the two groups in the psychosis sample. We measured the bivariate associations using the Mann-Whitney test for continuous variables and the chi-square test for categorical variables. For both sets of bivariate analyses, we determined statistical significance using two-sided tests at the alpha level cut-off of 5 percent.

Finally, we entered each of our independent variables in separate hierarchical logistic regression models on our dependent variable. We conducted a subgroup analysis using the variable of formulation $\times$ class to explore whether the association

Table 1 Sociodemographic, Clinical, and Legal Characteristics by Outcome of Competency Restoration

Characteristic	CST	PIST	*p*
Age, median (IQR)	36.2 (19.3)	37.8 (28.3)	.042
Time to decision, median (IQR)	135.0 (92.0)	182.0 (155.0)	< .001
Length of stay, median (IQR)	165.5 (103.0)	465.0 (280.0)	< .001
Male	197 (80.7)	54 (85.7)	.362
Race			.080
Non-Hispanic white	144 (59.0)	33 (53.2)	
Non-Hispanic black	88 (36.1)	29 (46.0)	
Main psychiatric discharge diagnosis			.108
Schizophrenia spectrum and other psychotic disorders	169 (69.8)	42 (66.7)	
Bipolar and related disorders	26 (10.7)	3 (4.8)	
Depressive disorders	7 (2.9)	1 (1.6)	
Neurocognitive disorders	5 (2.1)	7 (11.1)	
Neurodevelopmental disorders	8 (3.3)	6 (9.5)	
Anxiety disorders	4 (1.7)	1 (1.6)	
Trauma- and stressor-related disorders	4 (1.7)	0 (0.0)	
Substance-related and addictive disorders	2 (0.8)	0 (0.0)	
Personality disorders	2 (0.8)	0 (0.0)	
Malingering	2 (0.8)	0 (0.0)	
Disruptive, impulse-control, and conduct disorders	1 (0.4)	0 (0.0)	
None	12 (5.0)	3 (4.8)	
Type of charge			.670
Felony	152 (62.3)	42 (67.7)	
Misdemeanor	37 (15.2)	7 (11.3)	
Both	55 (22.5)	13 (21.0)	
Prior psychiatric treatment	218 (89.3)	47 (74.6)	.004

$n = 244$ deemed competent to stand trial; $n = 63$ deemed permanently incompetent to stand trial. Data are shown as *n* (%) unless otherwise noted. CST, competent to stand trial; PIST, permanently incompetent to stand trial; IQR, interquartile range.

between the use of LAI and competency status differed depending on the class of antipsychotics used. In all of our regression models, we first adjusted for age, sex, and race/ethnicity. We then adjusted for variables that were significant in the bivariate analyses. We calculated the odds ratios (OR) and the adjusted odds ratios (aOR) and their corresponding 95 percent confidence intervals (95% CI) of being in the CST group. We used IBM's Statistical Package for the Social Sciences (SPSS, version 21) to conduct the data analysis.

Results

Total Sample Characteristics

The total sample included the records of 307 defendants, of whom 244 (79.5%) were ultimately deemed CST and 63 (20.5%) were deemed PIST. As seen in Table 1, both groups consisted of more than 80 percent males and more than 50 percent non-Hispanic whites. Time to decision and length of stay were significantly shorter for the CST group ($p < .001$). The schizophrenia spectrum and other psychotic disorders diagnostic category was the most prevalent in both groups; bipolar and related disorders was the second most prevalent in the CST group. Neurocognitive disorders were most common in the PIST group. There were no significant differences in sex, race/ethnicity, main psychiatric discharge diagnoses, and charges between the CST and PIST groups.

More than 90 percent of the CST group and more than 75 percent of the PIST group took antipsychotics at some point during their stay (Table 2). There was a statistical difference in the formulation of antipsychotics used ($p = .027$): about 30 percent of both groups were put on LAI. There was a significant difference in the class of antipsychotics used between the two groups ($p < .001$). Patients in the CST group were more likely to be put on atypical antipsychotics (48.0% versus 17.5%), whereas those in the PIST group were more likely to be put on both typical and atypical antipsychotics throughout their stay (54.0% versus 32.8%). Nearly 39 percent of the CST group and 14 percent of the PIST group were put on oral atypical antipsychotics. Around 60 percent of the total sample were tried on more than one antipsychotic, a majority of whom were in the PIST group ($p = .001$).

Table 2 Psychotropic Use by Outcome of Competency Restoration

	CST	PIST	*p*
Antipsychotic use through stay			
Formulation			.027
Oral	146 (59.8)	31 (49.2)	
LAI ± oral	74 (30.3)	18 (28.6)	
Class			< .001
Typical	23 (9.4)	4 (6.4)	
Atypical	117 (48.0)	11 (17.5)	
Both	80 (32.8)	34 (54.0)	
Formulation × Class			< .001
Typical oral	11 (4.5)	3 (4.8)	
Atypical oral	95 (38.9)	9 (14.3)	
Typical and atypical oral	40 (16.4)	19 (30.2)	
Typical LAI ± oral	12 (4.9)	1 (1.6)	
Atypical LAI ± oral	22 (9.0)	2 (3.2)	
Typical and atypical LAI ± oral	40 (16.4)	15 (23.8)	
Number of antipsychotics through stay			< .001
One	79 (32.4)	6 (9.5)	
Two or more	141 (57.8)	43 (68.3)	
Psychiatric medications upon discharge			
Antipsychotics	188 (77.1)	45 (71.4)	.352
Mood stabilizers	47 (19.3)	26 (41.3)	< .001
Antidepressants	69 (28.3)	15 (23.8)	.529

n = 244 deemed competent to stand trial; *n* = 63 deemed permanently incompetent to stand trial. Data are shown as *n* (%).
CST, competent to stand trial; PIST, permanently incompetent to stand trial; LAI, long-acting injectable.

Psychosis Sample Characteristics

Our psychosis sample included the records of 209 defendants. As seen in Table 3 and Table 4, the CST and the PIST groups did not differ with regard to age, sex, and race. Time to decision and length of stay were predictably shorter among the CST group ($p < .001$).

Close to one third of patients in both groups was put on a LAI ($p = .689$). A majority of the CST group (52.7%) was put on atypical antipsychotics through their stay whereas the combined use of typical and atypical antipsychotics was most prevalent for the PIST group (71.4%). More than 40 percent of the CST group were put on oral atypical antipsychotics. More than 38 percent of the PIST group were tried on both typical and atypical oral antipsychotics. The use of both typical and atypical antipsychotics was highly prevalent in the CST and the PIST groups (37.7% versus 71.4%). Additionally, patients in the PIST group were significantly more likely to be tried on more than one antipsychotic through their stay (92.9% versus 68.9%; $p = .004$). We also found that the use of LAI correlated with being charged with a misdemeanor and being prescribed two or more antipsychotics throughout the stay

Table 3 Sociodemographic, Clinical and Legal Characteristics of the Psychosis Sample by Outcome of Competency restoration

Characteristic	CST	PIST	*p*
Age, median (IQR)	36.09 (14.7)	36.96 (24.6)	.208
Time to decision, median (IQR)	142.00 (88.0)	203.00 (186.3)	< .001
Length of stay, median (IQR)	171.00 (108.0)	484.00 (279.3)	< .001
Male	136 (81.4)	35 (83.3)	.776
Race			.522
Non-Hispanic white	89 (53.3)	23 (54.8)	
Non-Hispanic black	70 (41.9)	19 (45.2)	
Type of charge			.537
Felony	99 (59.3)	28 (66.7)	
Misdemeanor	30 (18.0)	5 (11.9)	
Both	38 (22.8)	8 (19.1)	
Prior psychiatric treatment	151 (90.4)	40 (95.2)	.538

n = 167 deemed competent to stand trial; *n* = 42 deemed permanently incompetent to stand trial. Data are shown as *n* (%) unless otherwise noted.
CST, competent to stand trial; PIST, permanently incompetent to stand trial; IQR, interquartile range.

Table 4 Psychotropic Use in the Psychosis Sample by Outcome of Competency Restoration

	CST	PIST	*p*
Antipsychotic use through stay			
Formulation			.689
Oral	105 (62.9)	25 (59.5)	
LAI ± oral	62 (37.1)	17 (40.5)	
Class			< .001
Typical	16 (9.6)	1 (2.4)	
Atypical	88 (52.7)	11 (26.2)	
Both	63 (37.7)	30 (71.4)	
Formulation × Class			.007
Typical oral	7 (4.2)	0 (0.0)	
Atypical oral	68 (40.7)	9 (21.4)	
Typical and atypical oral	30 (18.0)	16 (38.1)	
Typical LAI ± oral	9 (5.4)	1 (2.4)	
Atypical LAI ± oral	20 (12.0)	2 (4.8)	
Typical and atypical LAI ± oral	33 (19.8)	14 (33.3)	
Number of antipsychotics through stay			.004
One	52 (31.1)	3 (7.1)	
Two or more	115 (68.9)	39 (92.9)	
Psychiatric medications upon discharge			
Antipsychotics	150 (89.8)	40 (95.2)	.376
Mood stabilizers	30 (19.2)	19 (45.2)	< .001
Antidepressants	49 (29.3)	11 (26.2)	.687

$n = 167$ deemed competent to stand trial; $n = 42$ deemed permanently incompetent to stand trial. Data are shown as *n* (%) unless otherwise noted.
CST, competent to stand trial; PIST, permanently incompetent to stand trial; LAI, long-acting injectable.

(results not shown). Upon discharge, the prescription of antipsychotics and antidepressants was equally common between the two groups; mood stabilizers were more frequently prescribed for the PIST group ($p < .001$).

Antipsychotic Use and Regaining CST

Our bivariate analyses showed that the use of LAI was associated with a lower likelihood of regaining competency to stand trial compared with the strict use of oral antipsychotics. Our logistic regression models showed a different picture, however, as shown in Table 5. After adjusting for sex, age, race/ethnicity, time to decision, number of antipsychotics used during the stay, and the use of mood stabilizers upon discharge (adjusted model 2), we found that the use of LAI was associated with a nonsignificant increased likeli-

Table 5 Logistic Regression Analyses of Being CST on Antipsychotic Use Through Stay

	Unadjusted Model	Adjusted Model 1*	Adjusted Model 2†
Formulation			
Oral‡	–	–	–
LAI ± oral	0.84 (0.42–1.69)	0.81 (0.40–1.64)	1.39 (0.58–3.34)
Class			
Typical‡	–	–	–
Atypical	0.51 (0.06–4.24)	0.52 (0.06–4.36)	2.05 (0.15–28.14)
Both	0.13 (0.02–1.06)	0.11 (0.01–0.91)	1.26 (0.08–20.66)
Formulation × Class			
Atypical oral‡	–	–	–
Atypical LAI ± oral	1.23 (0.24–6.19)	1.25 (0.24–6.47)	1.30 (0.16–10.51)
Typical and atypical oral‡	–	–	–
Typical and atypical LAI ± oral	1.31 (0.54–3.14)	1.25 (0.51–3.11)	1.60 (0.56–4.57)

Data are presented as odds ratios (95% confidence intervals).
* Adjusted for age at admission, sex, and race/ethnicity.
† Adjusted for age at admission, sex, race/ethnicity, time to decision, number of antipsychotics used through stay, and use of mood stabilizers upon discharge.
‡ Reference characteristic.
CST, competent to stand trial; LAI, long-acting injectable.

hood of regaining competency to stand trial [aOR = 1.39 (95% CI 0.58–3.34)].

Our subgroup analyses did not yield different results. Among those who were put on atypical antipsychotics only, the use of LAI was correlated with a higher nonsignificant chance of regaining competency to stand trial after adjusting for controls [aOR 1.30 (95% CI 0.16–10.51)]. Finally, the use of atypical antipsychotics, as opposed to typical antipsychotics, was associated with a nonsignificant increased odds of being found CST [aOR = 2.05 (95% CI 0.15–28.14)].

Discussion

In both the CST and PIST groups, close to a third of patients in our sample were prescribed a LAI; this is almost five times more than reported in a previous study of misdemeanants undergoing restoration of competency.[12] Both groups had a majority of patients diagnosed with a psychotic disorder and prescribed two or more antipsychotics during their stay. Patients with psychotic disorders who were tried on multiple classes of antipsychotics were more likely to be deemed nonrestorable. The use of LAI antipsychotics did not seem to significantly increase the odds of being restored to trial competency.

Individuals in the PIST group were older, had a longer length of stay, included a higher prevalence of neurocognitive and neurodevelopmental disorders, and were more likely to be prescribed several psychotropic drugs during their hospitalization. Our sample characteristics are consistent with previous research which found that older age,[13] longer length of stay,[9,10,12,13] low IQ,[10,13–15] and polypharmacy[10] were predictors of nonrestorability.

We did not find a statistically significant increased likelihood of regaining competency to stand trial with the use of LAI antipsychotics. Recent research focusing on the use of LAI antipsychotics in clinical populations with schizophrenia, however, has relevant implications to the IST population. Several meta-analyses of randomized, controlled trials did not fully favor the clinical use of LAI antipsychotics in the treatment of schizophrenia.[16,17] Critics have argued, however, that randomized, controlled trials have an inherent selection bias because they include patients with less severe symptoms; participants in such trials are unlikely to have comorbid substance use or personality disorders.[8,18] One could therefore contend that the results from randomized controlled trials are not necessarily generalizable to the IST population.

Real-world cohort studies tend to support the use of LAI antipsychotics; some have found that these drugs were associated with a significant decrease in rehospitalization rates and treatment failure rates compared with their oral counterparts.[8,19] Increased adherence to treatment might explain these findings.[8,20]

A recent study found that the use of the LAI antipsychotic paliperidone palmitate among patients with schizophrenia with a prior history of incarceration was associated with a significant decrease in treatment failure rates compared with the use of oral antipsychotics. Patients without comorbid substance use who were treated with paliperidone palmitate were almost two times less likely to be incarcerated within the next 15 months than those on oral antipsychotics.[21]

Given that higher treatment adherence in the early phases of schizophrenia has been linked to better neurocognitive outcomes, it is not surprising that LAI antipsychotics have been increasingly recommended for patients newly diagnosed with psychotic disorders.[22,23] Several studies have shown that atypical antipsychotics improve cognitive performance among patients with schizophrenia compared to typical antipsychotics.[24] Moreover, recent evidence associates atypical LAI antipsychotics with cognitive benefits compared with oral counterparts, probably through better treatment adherence.[22,23,25] Cognitive performance has been found to be positively associated with restorability[10,13] and negatively associated with length of stay.[10,26] Taken together, these findings support the use of LAI antipsychotics for restoration of competency given their potential cognitive benefits.

The cost-effectiveness of LAI antipsychotics compared with oral antipsychotics has been discussed at length in the literature. Recent meta-analyses have shown that using atypical LAI antipsychotics reduced overall medical costs despite the fact that LAI formulations were more expensive than orals.[27,28] Competency restoration programs incur high costs, ranging between $300 and $1,000 daily per bed in inpatient competency restoration programs and between $101 and $500 daily per defendant in outpatient programs.[29] The regular use of LAI antipsychotics could presumably reduce costs through potentially increasing treatment adherence as well as

improving rates of restoration to competency, and thus indirectly reducing length of stay in the treatment program.

Our study has several limitations. First, our sample size was small and retrieved from only one state hospital. Our study was severely underpowered to detect a statistically significant effect ($1 - \beta = .060$).[30] Second, we lacked comprehensive information regarding baseline cognitive level, prior hospitalizations, and prior legal history on all included patients; previous studies have shown that these parameters are predictors of successful restoration. Failing to control for those parameters might have affected the validity of our findings. Third, we only included primary psychiatric diagnoses and did not account for potential comorbid substance use disorders, personality disorders, or intellectual delay, which might also have affected our results. Fourth, we did not assess for adherence to nonpharmacological treatment, such as competency restoration educational classes and recreational activities. Nonpharmacological treatment modalities have been shown to play a non-negligible role in successful restoration.[2] Fifth, our assessment of pharmacological treatment effects did not take into account doses, prescription patterns, or patient adherence; furthermore, we divided antipsychotics into classes and did not compare individual antipsychotics due to the small sample size. Any of these parameters might have modulated treatment outcomes. Sixth, our study is a retrospective record review and thus cannot adequately assess for causality between exposure and outcome.

In conclusion, our study provides novel information regarding pharmacological treatment strategies in the process of competency restoration. We did not find a statistically significant association between the use of LAI antipsychotics and a higher likelihood of successful restoration of trial competency. Our study's results and shortcomings highlight the need for large, longitudinal studies to further explore the efficacy and tolerability of LAI drugs compared with oral antipsychotics. Future research can thus help develop treatment guidelines within the setting of competency restoration.

Acknowledgments

We thank Dr. Debra Luechtefeld, Dr. Rachael Springman, and Ms. Jane Christman at the Metropolitan Saint Louis Psychiatric Center for their contribution to the research.

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