A Within-Subject Comparison to Evaluate the Effect of Paliperidone Palmitate on Patient Recovery Measures

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Background

Personal recovery has been defined as "a deeply personal, unique process of changing ones' attitudes, values, feelings, goals, skills, and/or roles—a way of living a satisfying, hopeful, and contributing life even with the limitations caused by illness" (*SAMHSA's Working Definition of Recovery: 10 Guiding Principles of Recovery*, 2012). In 2012 the Substance Abuse and Mental Health Services Administration (SAMHSA) updated the working definition of recovery as: "A process of change through which individuals improve their health and wellness, live a self-directed life, and strive to reach their full potential."

Previously we had shown that the treatment (Tx) effect associated with long-acting injectable Tx (McKinney et al, 2013) could be detected using recovery oriented outcomes. The current study aims to expand on those findings and our understanding of recovery-oriented outcomes in research studies by replicating our previous study using paliperidone palmitate (PP) as the Tx of interest. The following research question was addressed through our study:

1) Does Tx of patients with schizophrenia or schizoaffective disorders with PP result in improvements in the consumers' recovery-related outcomes?

Methods

A retrospective within-subjects comparison was conducted to evaluate recovery outcome measures before Tx (pre-Tx) and during Tx periods. Adult PP-treated consumers with schizophrenia or schizoaffective disorder who were new to PP, had at least 6 months of therapy, and were naïve to long-acting antipsychotic injections 6 months prior to PP were analyzed. The Recovery Markers Inventory (RMI) and the Consumer Recovery Measure (CRM) provide clinician and consumer perspectives, respectively. The RMI, CRM, and public service utilizations (PSUs) such as jail days, hospitalization for psychiatric or physical reasons, and detoxification facilities were evaluated using a multilevel-regression model framework. Total cost savings from PSU reductions were estimated using a state perspective expressed in 2014 US dollars. No adjustment was made for multiplicity.

Subjects

219 consumers were identified as eligible for inclusion in the study. The total pool of consumers consisted of a diverse mix of genders, races, and ages. The following table shows the breakdown of the subject characteristics.

Table 1. Demographic and Clinical Characteristics of Study Sample

Characteristics		n	%
Gender	Male	148	68%
	Female	71	32%
Age	Average (SD)	41.6	(12.8)
Diagnosis	Schizophrenia	92	42%
	Schizoaffective Disorder	127	58%
Months of Mental Health Treatment	Average (SD)	114	(83.5)
Weeks of Invega Sustenna Treatment	Average (SD)	115	115 (62.8)
Dosage of IS Treatment	Average (SD)	170 mg	(20.95)
Concurrent Anti-Psychotic Medications	None	89	41%
	One or More	130	59%
Physical Health Status at Start of IS Health Status	Good or Excellent	10	45.4%
	Fair	10	45.4%
	Poor	2	9.2%
Substance Abuse Diagnosis	Diagnosis Present	131	59.8%
	No Diagnosis	88	40.2%

Analysis

Analysis of the RMI and CRM outcomes utilized a random coefficients regression model (ie, multilevel regression model or hierarchical linear modeling [HLM]) (Raudenbush and Bryk, 2002). This analysis assumed measures were nested within Tx periods, which were nested within consumers. This allows us to estimate intercepts and slopes on each consumer, within each time period. The intercepts and slopes can be compared between the Pre-Tx and Tx periods (within-subjects comparisons) and among consumers (between-group comparisons). Analysis of the PSU data utilized a series of paired sample t-tests in lieu of the HLM model due to nonconvergence issues.

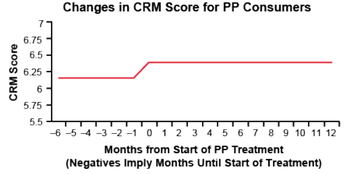
Results

CRM

In reviewing the CRM outcome for the paliperidone palmitate group, we evaluated 11 CRM models using differing combinations of the nine variables of interest. The model with the lowest Bayesian information criterion (BIC) and that was in line with current theory, given significant parameters and estimates, appeared to be the tenth model evaluated; this model included only the intercept and Tx period variables. Under this model we found a significant increase in the intercept of the PP Tx period as compared to the pre-Tx period ($\beta 0_{pre}$ = 6.16; $\beta 0_{post}$ = 6.40; $p < 0.05$), indicating an overall increase in the CRM scores during the PP Tx period. The table below provides the parameter estimates for the final model. The figure below shows a graphical display of the model for the average consumer.

Time Period	Parameter	Value	
Pre			
	Intercept	6.16	**
Tx			
	Intercept	6.4	**

**p<0.05



Recovery Markers Inventory

We evaluated 9 RMI models using differing combinations of the 9 variables of interest. The model with the lowest BIC and that was in line with current theory, given significant parameters and estimates, was the second model, which includes only the intercept, slope, and Tx period variables in the model. Under this model we found a significant increase in the intercept of the IS Tx period as compared to the pre-Tx period ($\beta 0pre = 4.05$; $\beta 0post = 4.15$; $p < 0.01$), along with a significant increase in the slope during the PP Tx period ($\beta 1pre = 0$; $\beta 2post = 0.005$; $p < 0.05$), indicating both an overall increase in the RMI score and increased rate of change during the PP Tx period as compared to the pre-Tx period. The table below provides the parameter estimates for the final model. The figure below shows a graphical display of the model for the average consumer.

Time Period	Parameter	Value	
Pre			
	Intercept	4.05	**
	SLOPE	0	
Tx			
	Intercept	4.15	**
	SLOPE	0.005	*

*p<0.05
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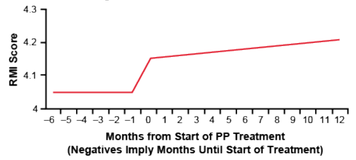

Public Service Utilization

With regard to PSU, it was found that a consumer receiving PP had on average a significant decrease of 2.34 (SD = 13.3) jail days every 3 months (9.4 days each year) and a significant decrease of 5.18 (SD = 38.3) psychiatric hospitalization days every 3 months (20.8 days each year) post-Tx. No differences were found in physical health hospital days or detoxification facility days. Using the estimates of $54/day savings for jail days and $1600/day for psychiatric hospital days, it is estimated that the average annual reduction in costs per consumer is $33,600. The table below summarizes the PSU data, and the bar chart shows the average changes in PSU per consumer for a 3-month time period.

	Mean Diff	SE	N	*p*
Jail	−2.34	0.90	219	< 0.05
Detox	0.08	0.40	219	> 0.05
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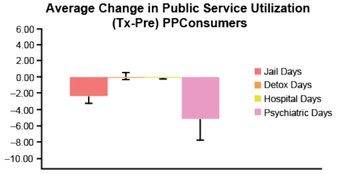

Conclusions

We were able to detect differences between pre-Tx and Tx periods with regard to both the CRM and RMI outcomes of schizophrenia or schizoaffective patients treated with PP. The study findings support the Tx of schizophrenia and schizoaffective disorders with PP from a recovery-oriented outcomes perspective, where positive increases in the recovery outcomes were found, along with significant savings from reductions in utilization of public services. Further studies should focus on prospective experimental designs that can provide higher levels of control, which are not present in the current retrospective study.

References

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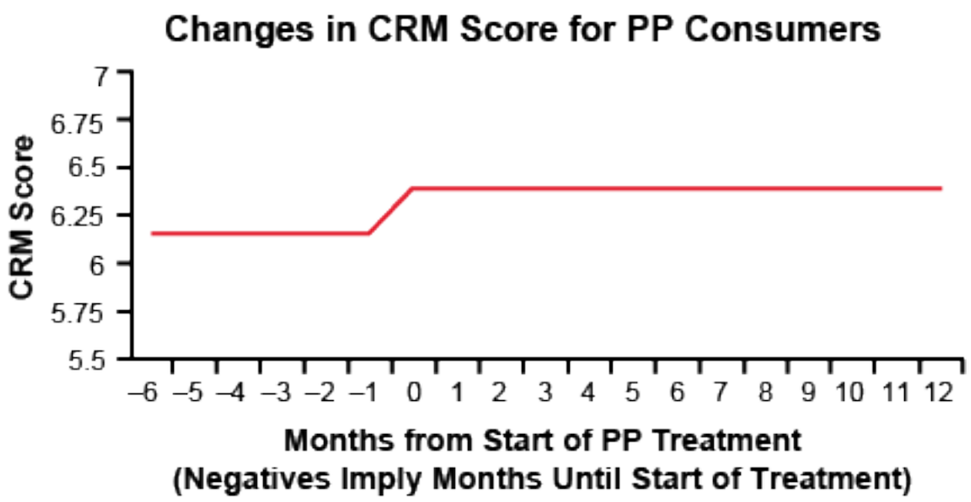

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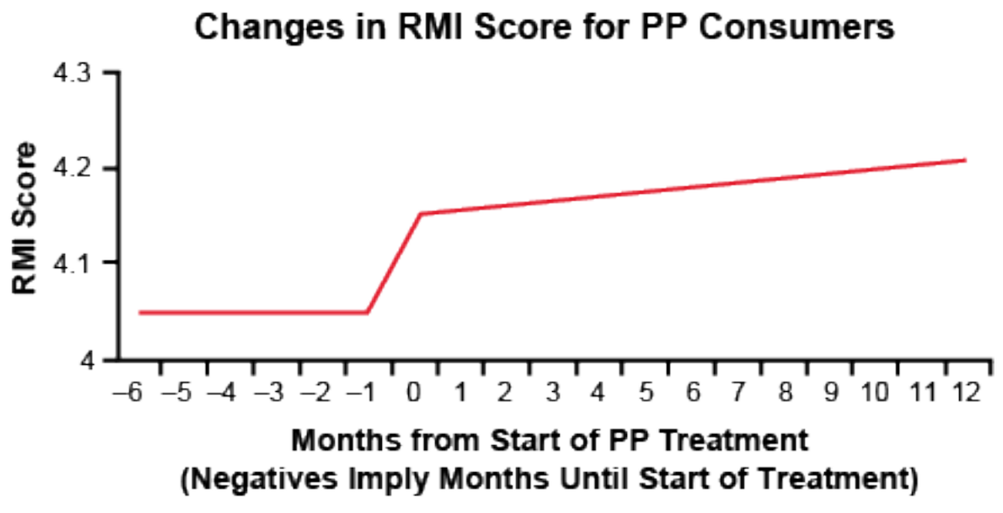

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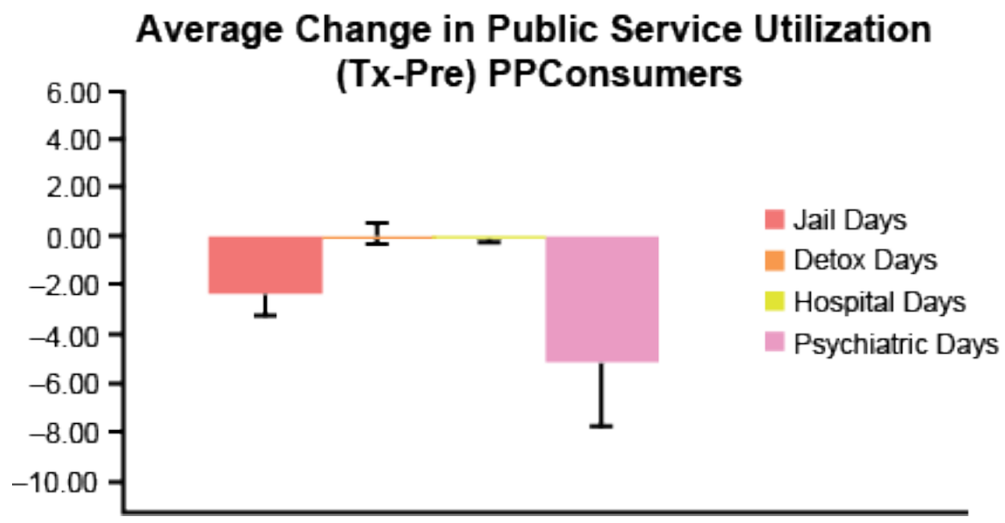

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