

# **The Utilization of Long-Acting Injectable Antipsychotics and Clozapine as Protective Measures for Patients with Psychotic Spectrum Disorders**

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## **ABSTRACT**

Schizophrenia is a mental illness that affects roughly 1.1% of the general population. This illness includes a wide array of symptoms, some such as hallucinations, delusions, and lack of affect. About 10% of these patients commit suicide. With this illness, medication non-adherence is frequently seen, and this can lead to relapse, re-hospitalization, and suicide. This study specifically looked at whether or not patients at the Washington Heights Community Service were discharged on injectable antipsychotics, which are administered by a trained medical professional either biweekly or monthly, or clozapine, which is a very effective oral antipsychotic, and if they had a history of medication non-adherence and suicidal ideation. This study's goal was to see whether or not the doctors at the clinic were utilizing these antipsychotics as protective measures for these patients. What was found was that many patients suffering from relapse due to medication non-adherence were not placed on these medications. This could be indicative of doctors not using these drugs for protective measure. Further research should be done, though, to verify and compare these findings with new data.

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## Injection

About one-third of patients who suffer from schizophrenia do not adhere to their medications (Byrne, 2006). Because of this, there is a higher rate of relapse, hospitalization, and suicide. One way to possibly prevent such high rates of medication non-adherence can be by utilizing long-acting injectable antipsychotics. These long-acting injectables, or decanoates, are usually administered bi-weekly or monthly by a trained physician or nurse. This form of delivery ensures that people with schizophrenia are receiving their needed medications. (Lee, et al., 2008)

In addition to ensuring adherence to medications through decanoate medications, another way of protecting against the devastation of suicide is through the use of an oral medication called clozapine. Clozapine has been found to reduce the rate of suicide in people with schizophrenia (Meltzer, 2002). Due to its side effects, clozapine requires close monitoring by weekly blood tests at first and eventually monthly blood tests. Often as a result of concern for side effects such as sedation, weight gain, salivation, or agranulocytosis, in addition to lack of resources, the rate of utilization of clozapine in the United States remains very low, from 0%-15%, even when it is an indicated treatment (Goren, et al., 2013), (Stroup, et al., 2013).

The Washington Heights Community Service (WHCS) consists of an inpatient unit and two outpatient mental health clinics, funded by the New York State Office of Mental Health, located in a low-income neighborhood in northern Manhattan. The WHCS serves about 1,000 adults, and according to 2012 data, 95% are from low socioeconomic status, 82% are racial/ethnic minorities, primarily Hispanic (62%). In regards to diagnoses, overall, 35% have a mood disorder, 60% have a psychotic spectrum disorder, and 23% have co-morbid substance use. In 2012, no patients of the WHCS had a death by suicide, but in 2013, three deaths at the WHCS were by suicide. More recently and directly related to the goal of this study, the New York State Office of Mental Health has released a zero suicide mandate to its operating facilities (New York State Office of Mental Health, 2013).

The goal of this research study was to determine which medications were prescribed on discharge to patients hospitalized at the Washington Heights Community Service in 2012 and 2013 who had a psychotic spectrum disorder and an elevated risk of self-harm. More specifically, the utilization of long-term injectables or clozapine as protective measures was

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examined. This research can be influential in how patients are treated now and in the future at the Washington Heights Community Service. It can also help inform physicians as to whether the long-term injectables and clozapine were utilized effectively, thereby potentially impacting the rate of suicide amongst patients with psychotic spectrum disorders.

### Methodology

Data was gathered for all patients admitted to the Washington Heights Community Service during the first half of 2012 from January to June, with a discharge diagnosis of a psychotic spectrum illness such as schizophrenia, schizoaffective disorder, or psychosis not otherwise specified. All patients readmitted within those 6 months were recorded as separate episodes, resulting in 47 patients but 62 admissions, and all data was analyzed based on 62 admissions. Information was then gathered for each admission including age, gender, ethnicity, length of stay, number of prior admissions (measured as 0, or 3 or more), readmission in the first 6 months of 2012, admission for suicide ideation or attempt, history of suicide ideation or attempt, psychosis (delusions, hallucinations, or both), substance use, insurance status, medication on discharge, experience of side effects, and past problems with medication adherence. Past problems with medication adherence was defined as patients who did not comply with their daily regimen of taking their needed medication, resulting in admission. The information was collected by extracting the crucial data from pre-existing patient records that were made anonymous. This was repeated with data from the first half of 2013 from January to June. Each readmission was again counted as a separate episode. The utilization rate of decanoates or clozapine at discharge for each episode of admission was noted.

A group comparison of 2012 and 2013 was also conducted to identify for population sample differences and prescribing practices.

Chi squared analyses were then conducted with factors that are relevant with respect to a long-term injectable prescription as well as a clozapine prescription. Effects of suicide, past

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suicide, substance use, medication adherence and number of prior admissions on the final medication regimen were calculated for these patients.

Chi squared Fisher's exact test was used to calculate statistics because it uses contingency tables. With this method, two different variables are inputted, each with a yes/no option, to easily see the correlation between the two columns (yes/no) and two rows (variable). The Graphpad analysis website <http://graphpad.com/quickcalcs/chisquared1.cfm> was utilized to calculate these analyses.



### Results

It should be noted that there were many differences between the 2012 and 2013 data. In 2012, there were many more readmissions within the same year, whereas the 2013 data only identified 2 readmissions. In addition, the 2013 data included far fewer suicidal admissions than the 2012 data.

**Table 1: Group Comparison – All Patients Discharged from the WHCS inpatient unit from January to June with a psychotic spectrum disorder:**

	2012	2013	Calculated statistical group difference (p value)
Total number of admissions	62	58	
Total number of admitted patients	47	56	
Total number of readmissions	15	2	<i>0.0012</i>
<b>Age</b>			
Under 18	2.1%	0%	0.4563
18 to 35	46.8%	37.8%	0.3153
36 to 65	44.7%	57%	0.1696
Greater than 65	6.4%	5.2%	1.0000
Gender	%M= 62 %F=38	%M=50 %F=50	0.8437
Suicide ideation (SI)	N= 16 (%=25.8)	N= 5 (%=9)	<i>0.0162</i>
History of SI	N= 29 (%=46.7)	N= 23 (%=39.7)	0.4652
Substance Abuse	N= 25 (%=40.3)	N= 16 (%=28)	0.1784
Many prior admits	N= 42 (%=67.7)	N= 45 (%=77.6)	0.3065
Past problems with adherence	N= 48 (%=77.4)	N= 44 (%=76)	1.0000

The results from the 2012 data indicated some unexpected outcomes. The results from the analysis between the long-term injectable (decanoates) and medication non-adherence were contrary to what could be surmised [Table 2]. Though approaching significance, the results indicate that medication non-adherence was not statistically correlated, with being placed on a decanoate, despite the fact that decanoates have been seen to significantly reduce the rate of medication non-adherence.

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**Table 2: Decanoate and Medication Non-adherence 2012:**

	<b>Decanoate Yes</b>	<b>Decanoate No</b>	<b>Total</b>
<b>Med. Non-adherence Yes</b>	12	23	<b>35</b>
<b>Med. Non-adherence No</b>	1	13	<b>14</b>
<b>Total</b>	<b>13</b>	<b>36</b>	<b>49</b>

**Fisher's exact test**

The two-tailed P value equals 0.0755

The association between rows (groups) and columns (outcomes) is considered to be not quite statistically significant.

Because the results from the decanoates and medication non-adherence contingency were considered insignificant, another analysis was conducted with medication non-adherence and many admissions. This was performed to see whether or not these patients that are medication non-adherent are relapsing or being re-hospitalized. The results from the analysis indicated that the two variables were significantly related, and that those who were medication non-adherent were being re-hospitalized [Table 3].

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**Table 3: Medication Non-adherence and Many Admissions 2012:**

	<b>Med. Non-adherence Yes</b>	<b>Med. Non-adherence No</b>	<b>Total</b>
<b>Many Admissions Yes</b>	27	6	<b>33</b>
<b>Many Admissions No</b>	9	8	<b>17</b>
<b>Total</b>	<b>36</b>	<b>14</b>	<b>50</b>

Fisher's exact test

The two-tailed P value equals 0.0470

The association between rows (groups) and columns (outcomes)

is considered to be statistically significant.

In addition, the relationship between clozapine and history of suicide ideation came up insignificant, contrary to what was expected. The results from this contingency indicated that having a history of suicidal ideation had no correlation with whether or not a patient was placed on clozapine [Table 4].

**Table 4: Clozapine and History of SI 2012:**

	<b>Clozapine Yes</b>	<b>Clozapine No</b>	<b>Total</b>
<b>History of SI Yes</b>	6	22	<b>28</b>
<b>History of SI No</b>	4	15	<b>19</b>
<b>Total</b>	<b>10</b>	<b>37</b>	<b>47</b>

**Fisher's exact test**

The two-tailed P value equals 1.0000

The association between rows (groups) and columns (outcomes) is considered to be not statistically significant.

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The 2013 data appeared to be less significant, with only one contingency table approaching significance. That contingency suggested that people with a history of suicidal ideation were less likely to be placed on clozapine. This was contrary to what was expected because based on prior research, clozapine is most effective with patients who have or have had suicidal ideation [Table 5].

**Table 5: Clozapine and History of SI 2013:**

	Clozapine Y	Clozapine N	Total
History of SI Y	1	22	23
History of SI N	9	26	35
Total	10	48	58

### Fisher's exact test

The two-tailed P value equals 0.0716

The association between rows (groups) and columns (outcomes) is considered to be not quite statistically significant.

## Discussion

The differences in the patient groups between 2012 and 2013, notably, the number of readmissions with 6 months, and the number of admissions for suicide, could help detect possible prescribing patterns and areas for future investigation. More specifically, while the number of readmissions within 6 months was statistically different between the two groups, the total number of people with past problems of adherence and many admissions was not very different in each year. In 2012, 15 people were readmitted, at times more than once. Of the patients that were readmitted, 60% of them were placed on clozapine or a decanoate on their last admission, three patients being on clozapine and another three on decanoates. In 2013, two people were readmitted, and one was placed on a decanoate on their last admission.

In 2012, because of the large amount of patient readmissions, there were a higher percentage of patients that were placed on clozapine and decanoates. This could be due to more

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patients that were medication non-adherent, who would benefit significantly from being placed on a decanoate instead of relying on himself or herself to take an oral pill every day. The clozapine could have also benefitted these patients, many of whom might have been treatment resistant.

Since there were only two readmissions in 2013, with only one of them being placed on a decanoate, this can illustrate how doctors are more likely to place a patient on an alternative medication like clozapine or a decanoate if they relapse and are re-hospitalized within a short period of time. We can hypothesize that the immediacy of readmission influences prescribing practice, more than either the history of many admissions or past problems with adherence. In order to detect whether this is an actual trend, more years of prescribing information would need to be gathered and analyzed.

In each year, we did not detect a statistically significant correlation between utilization of clozapine for people with psychotic spectrum disorders, who also had admissions for suicide or many prior admissions. We also did not detect statistically significant correlations with utilization of long-term injectables and history of non-adherence and many prior admissions. Qualitative data, such as patients' medication preferences, or medical contraindications for prescription of clozapine or long-term injectables, which could have also influenced physicians' medication management decisions, were not gathered. However, given the benefits of clozapine and long-term injectables for people with psychotic spectrum illnesses and the findings in this report, further qualitative study could help elucidate why physicians on the WHCS did not consider clozapine or long-term injectables for patients who would otherwise seem to meet criteria for these medications.

### Conclusion

The results from both 2012 and 2013 could not demonstrate prescribing practices consistent with literature recommendations; that is, in these two samples, there was no statistically significant correlation between suicide, history of suicide, past problems with adherence and many admissions and the utilization of either clozapine or a long-term injectable. To summarize, medication non-adherence and administration of decanoates were not considered to be significantly significant, which was contrary to what was expected. To further comprehend this finding, medication non-adherence and many admissions were analyzed together to see if patients that were medication non-adherent were being re-hospitalized. The results indicated that medication non-adherent patients were being readmitted, supporting the notion that more patients that are medication non-adherent should be placed on decanoates. Clozapine administration and history of suicide or current admission for suicide also did not correlate, which is contrary to what would be expected, given demonstrated benefits of clozapine in prior research studies.

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