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The Association Between Timely Outpatient Visits and the Likelihood of Rehospitalization for Schizophrenia Patients

Herng-Ching Lin, PhD
Taipei Medical University

Hsin-Chien Lee, MD, MPH
Taipei Medical University–Shuang Ho Hospital and Taipei Medical University

Early rehospitalization is common in schizophrenia. Given the impact on cost containment, there is an urgent need to identify the predictors of rehospitalization. This study aims to examine the association between the frequency of timely outpatient visits and the likelihood of early rehospitalization in schizophrenia patients. After adjusting for gender, age, substance use, and length of stay, patients failing to attend any outpatient appointments within 2 months after discharge had significantly higher rehospitalization rates than those attending at least 1 appointment. Thus, timely outpatient visits, shortly after discharge, may be associated with a decreased risk of rehospitalizations.

Keywords: outpatient, schizophrenia, rehospitalization

Although schizophrenia is estimated to affect no more than 1% of the population at any given time, the inherent complexity of schizophrenia makes it both costly and difficult to provide care (Warner & de Girolamo, 1995). Health care expenditure on schizophrenia currently accounts for 1.6 to 2.5% of the total health care budget in most of the developed countries (Davies & Drummond, 1994; Evers & Ament, 1995).

In Taiwan, the total schizophrenia-related health care expenditure in 1999 accounted for 1.2% of the national health care budget, with two thirds of this expenditure arising specifically from inpatient services. Patients with schizophrenia had higher use and costs of mental health care services than those with a minor psychiatric disorder (Chien et al., 2004). In particular, the majority of patients with schizophrenia tend to be readmitted within a short period after their discharge from the hospital (Klinkenberg & Calsyn, 1996). There is an urgent need to determine what constitutes the predictors for rehospitalization, and how the current rehospitalization rate can be reduced, given the potential for impact on cost containment within the overall treatment of schizophrenia.

Prior studies on predictors of rehospitalization have tended to focus on index hospitalization and patient's characteristics such as length of stay, age, gender, and comorbid substance use, rather than outpatient or aftercare services (Appleby, Desai, Luchins, Gibbons, & Hedeker, 1993; Lin et al., 2006; Lyons et al., 1997; Olfson et al., 1999; Swett, 1995). Furthermore, the rather limited number of studies in this area has tended to report controversial results in their investigations of the association between aftercare services and rehospitalization. Despite some studies that found that referral to aftercare following discharge from the hospital was correlated with a lower readmission rate for psychiatric services (Casper, Romo, & Fasnacht, 1991; Green, 1988; Nelson, Maruish, & Axler, 2000), some have found a positive relationship between aftercare services and readmission rates (Thompson, Neighbors, Munday, & Trierweiler, 2003).

Such contradictory results might be explained either by selecting participants from a single institute (Thompson et al., 2003) or by including participants with various psychiatric diagnoses (Casper et al., 1991; Nelson et al., 2000). Those findings could be compromised by lacking generalizibility beyond the samples studied.

Because rehospitalization rates have long been used to determine the effectiveness of inpatient care, stabilization from inpatient care can be sustained over time for patients who keep follow-up appointments. Thus, keeping timely outpatient visits after hospital discharge might have an impact on the rehospitalization rate.

Using 2-year nationwide population-based data on Taiwan, this retrospective study sets out to examine the association between the frequency of outpatient visits for patients with schizophrenia within 60 days of discharge from the index hospitalization, and the risk of rehospitalization within 90, 180, 270, and 365 days. We hypothesize that outpatient visits shortly after discharge can be associated with a decreased risk of rehospitalization because a continuation of care after discharge can be ensured, but we also hypothesize that this impact will decrease over time.

Method

Database

This study uses data from the National Health Insurance Research Database (NHIRD) covering the years 2002 and 2003. The NHIRD includes all claims data from the National Health Insur-

Herng-Ching Lin, PhD, School of Health Care Administration, Taipei Medical University, Taipei; Hsin-Chien Lee, MD, MPH, Department of Psychiatry, Taipei Medical University–Shuang Ho Hospital and Department of Psychiatry, School of Medicine, Taipei Medical University.

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For reprints and correspondence: Hsin-Chien Lee, Department of Psychiatry, Taipei Medical University-Shuang Ho Hospital, 291 Chung Cheng Road, Chung Ho, Taipei 235, Taiwan. E-mail: ellalec@tmu.edu.tw

ance (NHI), a program implemented in Taiwan in March 1995 as a means of financing health care for all of the island's 23 million citizens. The NHI Bureau contracts with most of the medical institutions in Taiwan, and indeed, around 96% of the island's population has joined the NHI program since its inception. The NHI program waives all copayments for the treatment of serious mental disorders, thus providing an incentive for patients with schizophrenia to utilize mental health care.

Study Sample

There were 15,607 admissions in the NHIRD under the International Classification of Disease, Ninth Revision, Clinical Modification (ICD–9–CM; Swanson, 2000) principal diagnosis code 295 (schizophrenic disorders) from January 2002 to October 2002. The index hospitalization was defined as a patient's first admission to an acute psychiatric inpatient unit during the study period. Because outpatient service, rather than inpatient care, was the predictor of interest for the risk of rehospitalization in this study, the same quality of inpatient care of the index hospitalization should be met to reduce confounding. Thus, patients dying in hospital, discharged against medical advice, or transferred to other hospitals were excluded.

Furthermore, poor quality of inpatient care could lead to relapse of psychotic symptoms soon after discharge resulting in earlier rehospitalization. The early rehospitalization rate may serve as a good indicator of the effectiveness of inpatient care, but it may not capture the impact of outpatient services after discharge. Because this study focuses on the impact of outpatient visits within 60 days of discharge, patients readmitted within 60 days of discharge, who might not have benefitted from timely outpatient visits, were excluded. Ultimately, we were left with a study sample of 5,441 schizophrenia patients.

Statistical Analysis

The SAS statistical package (SAS System for Windows, Version 8.2) was used to perform the statistical analyses. The primary study purpose was to determine the predictors of rehospitalization within 90, 180, 270, and 365 days of discharge from the index hospitalization. All information on discharge dates, admission dates, and outpatient visit dates are recorded within the NHIRD. The primary predictor of interest in this study was the number of outpatient visits within 60 days after discharge from the index hospitalization. We categorize the number of outpatient visits into four groups; 0, 1, 2 and ≥3.

Separate multiple-logistic regression analyses were then performed to examine the relationship between the number of outpatient visits and rehospitalization within 90, 180, 270, and 365 days of discharge from the index hospitalization. Our analyses adjust for the following covariates: patient age and gender and comorbidity with substance abuse or dependence. It has been documented, within a number of the prior studies in this field, that length of stay (LOS) is an important predictor of rehospitalization and a proxy for symptom severity; therefore, this study also adjusts for LOS to reduce confounding from the index hospitalization. A two-sided p value of less than, or equal to, .05, was considered to be statistically significant.

Results

Table 1 describes the distribution of sample patients with schizophrenia , of which 2,987 (54.9%) were male, and 109 (2%) had some degree of substance abuse or dependence. As to the number of outpatient visits within 60 days of discharge from the index hospitalization, more than one-third of the sampled patients (36.8%) failed to keep any of their outpatient appointments.

Table 2 provides details of the 90-, 180-, 270-, and 365-day rehospitalization rates, by number of outpatient visits, within 60 days of discharge from the index hospitalization. The figures in the table consistently show that, as compared to those patients who had attended at least one outpatient appointment, those who failed to keep any of their outpatient appointments had significantly higher 90-, 180-, 270-, and 365-day rehospitalization rates (all $p <$ .001).

After adjusting for patient gender and age, substance abuse or dependence, and length of stay of the index hospitalization, the separate multiple-logistic regression analyses consistently revealed that, as compared to those patients who attended at least one outpatient appointment, those who failed to keep any outpatient appointments were more likely to be rehospitalized within 90, 180, 270, or 365 days (see Table 3).

More specifically, after adjusting for the relevant covariates, the indication is that, as compared to those patients who attended at least one outpatient appointment, those who failed to keep any

Table 1
Descriptive Analysis of Sampled Patients With Schizophrenia

Variables	*n*	%
No. of outpatient visits within 60 days of index discharge		
0	1,999	36.8
1	1,329	24.4
2	578	10.6
≥3	1,535	28.2
90-day readmission after index discharge		
Yes	870	16.0
No	4,571	84.0
180-day readmission after index discharge		
Yes	1,530	28.1
No	3,911	71.9
270-day readmission after index discharge		
Yes	1,929	35.5
No	3,512	64.5
365-day readmission after index discharge		
Yes	2,252	41.4
No	3,189	58.6
Age at index hospitalization ($M \pm SD$ years)	36.6 ± 12.1	
<18	84	1.5
18 to 44	4,161	76.5
45 to 64	1,018	18.7
≥65	178	3.3
Gender		
Male	2,987	54.9
Female	2,454	45.1
Substance abuse or dependence		
Yes	109	2.0
No	5,332	98.0
Length of stay of index hospitalization ($M \pm SD$ days)	23.0 ± 17.6	

Note. N = 5,441.

Table 2
Crude Odds Ratios for Rehospitalization of Patients With Schizophrenia, by Number of Outpatient Visits Within 60 Days of Index Discharge

Readmissions	No. of outpatient visits within 60 days of index discharge			
	0	1	2	≥3
Within 90 days				
% of total	30.9	7.5	7.1	7.3
OR	1.00	0.18	0.17	0.18
95% CI	—	0.15–0.23	0.12–0.24	0.14–0.22
Within 180 days				
% of total	42.7	19.0	27.3	33.4
OR	1.00	0.32	0.39	0.42
95% CI	—	0.27–0.37	0.34–0.45	0.36–0.48
Within 270 days				
% of total	49.1	20.1	26.0	33.4
OR	1.00	0.34	0.36	0.42
95% CI	—	0.27–0.42	0.30–0.45	0.34–0.51
Within 365 days				
% of total	54.6	20.0	28.3	34.1
OR	1.00	0.34	0.41	0.43
95% CI	—	0.29–0.39	0.35–0.47	0.37–0.49

Note. N = 5,441. OR = odds ratio; CI = confidence interval.

outpatient appointments were 5.56 times more likely to be rehospitalized within 90 days (reciprocal of 0.18), 3.03 times more likely to be rehospitalized within 180 days, 2.50 times more likely to be rehospitalized within 270 days, and 2.33 times more likely to be rehospitalized within 365 days.

Discussion

This large-scale population-based retrospective records study examines the association between the frequency of outpatient visits for aftercare services and the risk of rehospitalization. After adjusting for gender, age, substance use, and length of stay, we find that, as compared to those patients who attended at least one outpatient appointment within 60 days after discharge from the index hospitalization, those who failed to keep any of their outpatient appointments were more likely to be rehospitalized within 90, 180, 270, and even 365 days. This finding supports our hypothesis that outpatient visits shortly after discharge is associated with a decreased risk of rehospitalization. Our finding is congruent with findings of some of the prior studies that have reported that failure to engage in outpatient services is associated with an increased risk of rehospitalization for patients with chronic and persistent mental disorders (Casper et al., 1991; Green, 1988; Nelson et al., 2000).

Thompson et al. (2003) analyzed 1,481 patients and reported a positive and significant relationship between the use of aftercare services and the risk of rehospitalization within 6 months of discharge. However, that study sampled primarily indigent, involuntarily admitted patients from a single hospital that might have biased the results due to the unique characteristics of the sample and the policy of the institute for referral to aftercare. A possible explanation for such contradictory findings was the use, within the prior studies, of a variety of definitions of aftercare services, ranging from outpatient psychiatric services and foster care, to nursing homes and residential care. Furthermore, in that study, only a small percentage of patients were referred to aftercare programs and referral to aftercare services did not mean receiving those services.

Our population-based study was limited to outpatient visits and has found that, regardless of the frequency of outpatient visits within a 60-day period after discharge, with an increase in the length of time since the index discharge, there was a corresponding increase in rehospitalization rates. It seems that the impact of timely outpatient visits after discharge on rehospitalization decreases over time.

Table 3
Adjusted Odds Ratios for Rehospitalization of Patients With Schizophrenia, by Number of Outpatient Visits Within 60 Days of Index Discharge

Variables	Readmissions							
	90 days		180 days		270 days		365 days	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
No. of outpatient visits								
0	1.00	—	1.00	—	1.00	—	1.00	—
1	0.18	0.15–0.23	0.33	0.28–0.39	0.40	0.35–0.47	0.43	0.37–0.50
2	0.17	0.12–0.24	0.36	0.29–0.45	0.38	0.31–0.47	0.44	0.36–0.54
≥3	0.18	0.14–0.22	0.36	0.30–0.42	0.43	0.37–0.50	0.46	0.40–0.53
Gender								
Male	1.09	0.93–1.27	1.16	1.03–1.32	1.18	1.05–1.33	1.19	1.06–1.33
Female	1.00	—	1.00	—	1.00	—	1.00	—
Age (years)								
<18	1.46	0.81–2.62	1.10	0.67–1.80	0.85	0.52–1.37	0.81	0.51–1.29
18 to 44	1.00	—	1.00	—	1.00	—	1.00	—
45 to 64	1.45	1.20–1.74	1.06	0.91–1.24	0.99	0.86–1.15	0.93	0.81–1.08
≥65	2.51	1.78–3.54	1.76	1.28–2.42	1.50	1.10–2.05	1.34	0.98–1.83
Substance abuse or dependence								
Yes	1.02	0.61–1.72	0.98	0.64–1.50	1.14	0.77–1.70	1.30	0.88–1.92
No	1.00	—	1.00	—	1.00	—	1.00	—
Length of stay of index hospitalization (days)	1.00	1.00~1.00	1.00	1.00~1.01	1.00	0.77~1.01	1.01	1.00~1.01

Note. N = 5,441. OR = odds ratio; CI = confidence interval.

Nevertheless, our results remain at odds with the observations of Nelson et al. (2000). They reported that, for those patients who complied with at least one outpatient follow-up appointment after discharge, readmission rates remained at about 11% within a 365-day period, with no apparent increase over time. However, they did not limit their sample to patients with schizophrenia and included psychiatric patients with diverse diagnoses. Besides, only voluntary admissions were included in the NHIRD used in our study, so the difference in findings could reflect the mix of voluntary and involuntary admissions in the study by Nelson et al.

Our study also found that 36.8% of sampled schizophrenia patients discharged from hospital did not engage in any psychiatric outpatient services within 60 days of discharge. This is lower than the 40% to 60% reported in the previous studies on the failure to successfully link outpatient mental health care following acute hospitalization (Bridge & Barbe, 2004; Klinkenberg & Calsyn, 1996). A possible reason for the low percentage of patients with schizophrenia failing to keep any outpatient appointments in Taiwan is the implementation of the NHI program that waives all copayments for the treatment of serious mental disorders, including schizophrenia, and provides universal coverage and comprehensive benefits. Therefore, access to health care providers, free of charge, may create greater incentives for patients with mental disorders to use outpatient services after their discharge from hospital. In addition, clinical bridging strategies to avoid unnecessary gaps in the delivery of psychiatric services may contribute to this difference (Boyer, McAlpine, Pottick, & Olfson, 2000).

Limitations

This study is based on data drawn from the NHIRD medical benefit claims, a dataset that does not include the clinical severity of psychopathological features. However, a study by Laessle, Pfister, and Wittchen (1987) indicated that the severity of psychopathological features had only minor predictive value on psychiatric patient rehospitalization rates. Nevertheless, some part of the suggested policy-oriented investigation into the impact of outpatient visits on rehospitalization rates should continue to focus on this particular dimension. Further, only voluntary admissions were included in the NHIRD, which may also affect generalizability of our findings.

Despite such limitations, we found that the use of outpatient services shortly after discharge is strongly associated with a decreased risk of rehospitalization. This finding is congruent with those from experimental studies that have shown interventions addressing psychoeducation and service continuity to be effective in preventing rehospitalization (Pitschel-Walz et al., 2006; Prince, 2006). Taken as a whole, this combination of correlational and experimental evidence provides an even more persuasive case for the argument that efforts directed toward optimizing the linkage between schizophrenia inpatient and outpatient care may be a cost-effective way to reduce rehospitalization rates.

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