

Short Communication

Does Previous Admission History Predict Risk of Rehospitalisation in Schizophrenia and Related Disorders?

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Abstract

Aim: To examine the association between the number and duration of previous admissions and later rehospitalisation in patients with schizophrenia.

Method: Retrospective data on previous admissions were collected for a cohort treated in three New Zealand public hospitals during 2009-2011. The total cohort (n=451) was divided into groups according to number of admissions and time spent hospitalised in the previous two years. The subsequent two year hospitalisation records were then compared between groups.

Result: Analysis found no significant associations between rehospitalisation rates and number or duration of previous admissions (hazard ratios 0.92-1.57; p values 0.06-0.79).

Conclusion: Neither number nor cumulative duration of previous hospitalisations significantly predicted rehospitalisation risk.

INTRODUCTION

Hospitalisation for relapse in schizophrenia and related disorders is generally considered detrimental to well-being and is a costly treatment option [1]. Many variables, including previous admission history, have been reported to predict readmission [1-6]. For example, an Australian study [6] examined the rate of rehospitalisation for schizophrenia, bipolar disorder and depression over 5 years, highlighting the number of prior admissions as a predictor of both readmission rate and duration. Additional factors identified as predictors of rehospitalisation include length of stay, illness severity, substance abuse, personality disorder, medical comorbidity, male gender, unemployment, involuntary first admission, and limited access to follow-up care and community support [7, 8]. Hospital admissions also have become briefer since deinstitutionalization and the evolution of community based psychiatric care [9, 10].

We previously reported the correlates of rehospitalisation for schizophrenia or related disorders in a two year follow-up study [11]. The present report uses the same cohort to examine the association between number and duration of previous admissions and subsequent rehospitalisation.

METHOD**Study Design**

We examined the clinical records of an unselected series of 451 inpatients from three New Zealand (NZ) public hospitals with index discharge diagnoses of schizophrenia and related disorders between July 2009 and December 2011. The cohort has been described in detail [11,13].

Most studies report average hospital stays ranging between 15-30 days [9, 12] and a median of one readmission [14,15]. Our study [13] of this same cohort showed a mean length of stay of 26 days, 61% spending between 1 and 21 days. Accordingly, we divided the cohort into two sets of three groups, the first set according to the number of previous admissions (none, 1-2, or ≥ 3) in the preceding two years (2007-2009), the second set according to the total duration of hospitalisation during this time (none, <3 weeks, and ≥ 3 weeks). These divisions were considered to be clinically meaningful, and resulted in groups with adequate numbers for statistical comparison.

The analysis then skipped the index admission phase (shared by all), and examined the relationship of each of the

three groups to subsequent hospitalisation over two years, until December 2013. The data on hospitalisation were extracted from the Programme for the Integration of Mental Health Data, a NZ Ministry of Health collection of psychiatric service activity and outcomes database. Details about this dataset have been described elsewhere [11,13]. Ethical approval was granted by the Northern Y Ethics Committee (NTY/12/exp/026).

Participants

The study cohort comprised patients aged 18-75 years, with discharge diagnoses of schizophrenia or related disorders (International Classification of Disease, version 10, F20-29), given by responsible clinicians during the index admission. Exclusion criteria were intellectual disability, psychoses due to substance abuse, general medical or other organic causes.

Available variables

Age, gender, ethnicity, voluntary/informal legal status, duration of admissions, and treating clinician characteristics were recorded at the time of the index discharge. Antipsychotics prescribed at that time were divided into the following groups for analysis: first vs. second generation antipsychotics (irrespective of route), oral vs. long-acting injectable (LAI) antipsychotics, and clozapine vs. no clozapine. The LAI group also included patients receiving additional oral medication. Antipsychotic dosages were converted to chlorpromazine equivalents for analysis (100-300, 301-600 and >600mg/day according to dose ranges mentioned in schizophrenia guidelines [14]).

Data analysis

The relationships between the number and duration of previous admissions and later rehospitalisation were explored using the Pearson chi-square test, together with univariate and multivariate proportional hazards regression analyses. The number and length of previous admissions were considered as main predictors, and the multivariate analyses included adjustments for demographic variables, types, routes and chlorpromazine equivalent dosages of antipsychotics, length of index admission, compulsory admission status, and clinician characteristics [13]. Data were analysed using SPSS (PC version 20.0). P values <0.05 were considered significant.

RESULTS

Of the 451 patients, 64% were male, and 60% were Maori (the indigenous Polynesian population of New Zealand). Most patients (64%) were between the ages of 25-49, with 16% over 50 and 3% over 65.

Schizophrenia was the most common diagnosis (76%), followed by schizoaffective disorder (20%). The remaining 4% were diagnosed with brief psychotic disorder, acute and transient psychotic disorder, delusional disorder or psychotic disorder NOS.

At the time of index discharge more than half (n=258, 57%) of patients were taking only oral antipsychotics, including clozapine. 43% (n=193) were receiving LAIs. Most patients (n=324, 72%) were prescribed SGAs, 16% (n=73) FGAs, the remainder (12%) receiving a combination of both. Clozapine was prescribed to 90

(20%) patients (Table 1). Further details of this analysis have been described previously [13].

The two-year follow-up data (Table 2) showed that of 158 patients previously hospitalized before their index admission, 44% (69) were re-hospitalized within two years; exactly the same proportion applied to patients with no previous admissions (n=130/293). Likewise, no statistically significant differences in rehospitalisation rate were observed between patient groups with shorter or longer durations of index admission.

As shown in (Table 3), both uni- and multivariate analyses failed to detect significant associations between the numbers and duration of previous admissions and rehospitalisation rate. Multivariate analysis showed a near significant (p=0.06) trend toward increased rehospitalisation risk for those with 3 or more previous admissions. When comparisons of antipsychotic medication variables (oral vs. LAI, FGA vs. SGA, clozapine vs. no clozapine) were considered, multivariate analyses returned similar non-significant results (data not shown).

DISCUSSION

This study explores the association between number and duration of previous admissions and subsequent rehospitalisation rate for a cohort with schizophrenia and related disorders. Our findings appear inconsistent with studies reporting that frequent previous admissions predict subsequent hospitalisation [1, 5, 15-17]. On the other hand, studies that have taken into account individuals' readmission risk [18,19] have noted that number/duration of hospitalisations did not necessarily influence readmission rate. Another study [20], which considered sociodemographic and clinical factors, also failed to show an association between previous admissions and rehospitalisation rates. Individual vulnerability is important to consider and may facilitate better management of this heterogeneous disorder.

The study limitations are those inherent for observational (non-interventional) studies (Tables 2, 3). The present cohort was compiled from discharge data of three hospitals and the resulting unselected sample allowed inclusion of patients with a variety of comorbidities. Although most patients had chronic schizophrenia, we did not differentiate between first episode and chronic illness. This may influence outcome due to the fact that most readmissions occur in the first two to five years, and over

Table 1: Antipsychotics prescribed on discharge.

Class	
FGA	73 (16%)
SGA	324 (72%)
Both	54 (12%)
Route	
Oral	230 (51%)
LAI	69 (15%)
Oral plus LAI	124 (28%)
Two oral	28 (6%)
FGA: First Generation Antipsychotics SGA: Second Generation Antipsychotics LAI: Long Acting Injectables	

Table 2: Rehospitalisation rate by number and duration of previous admissions.

Patient groups	Rehospitalisation, n (%)
Number of previous admissions	
No previous admission (n=293)	130 (44%)
1-2 previous admissions (n=106)	43 (41%)
≥3 admissions (n=52)	26 (50%)
Total duration of previous admissions	
< 3 weeks (n=68)	31 (46%)
≥ 3 weeks (n=90)	38(42%)
1-2 vs. >3 previous admissions: Pearson's chi-square=1.28, df=2, p=0.53	
< 3 vs. ≥3 weeks duration of previous admissions: Pearson's chi-square=0.2, df=2, p=0.90	

Table 3: Rehospitalisation risk analysed by number and duration of previous admissions.

Patient groups	HR (95% CI) univariate analysis	P value	HR (95% CI) multivariate analysis	P value
1-2 vs. zero admissions	0.86 (0.61-1.22)	0.39	0.90 (0.64-1.29)	0.59
≥3 vs. zero admissions	1.23 (0.81-1.87)	0.34	1.57 (0.99-2.49)	0.06
brief (< 3 weeks) vs. zero admission	1.04 (0.70-1.54)	0.84	1.07 (0.71-1.61)	0.75
long (≥3 weeks) vs. zero admission	0.92 (0.64-1.32)	0.65	1.05 (0.72-1.55)	0.79

HR: Hazard Ratio
 CI: Confidence Interval
 Multivariate analysis includes adjustments for age, gender, ethnicity, compulsory status, duration of index admission, antipsychotic class (FGA vs. SGA), Chlorpromazine equivalent dose, country of training and number of years in practice of the treating doctor,

time readmission rates decline [20]. Another limitation of our analysis is that information on medication adherence and other potentially relevant baseline characteristics (substance abuse, socioeconomic status, marital status) was not available.

The cohort was selected from discharge data, therefore apart from gender and ethnicity, other baseline characteristics (compulsory admission, prescribed antipsychotics, duration of admission) were noted for the index admission only. While all of the 451 patients were hospitalised, this study considered only rehospitalisation in the two years following the index admission as outcome and the number and duration of admissions in the two years prior to the index admission as predictors. Considering rehospitalisation, the data collection period of 4 years is relevant for a chronic illness like schizophrenia. The patients hospitalised in the follow-up period therefore were effectively in their third or fourth year of follow-up. Previous studies have demonstrated that most rehospitalisation occur within the first 6-12 months after inpatient discharge [11, 21, 22]. That difference may help explain why some of the findings in this paper differ from our earlier analysis of rehospitalisation in the same cohort [11]. Our previous publication [11] concluded shorter duration of index hospitalisation is associated with increased rehospitalisation rate within two years of discharge.

CONCLUSION

This “real life” observational study combining data from a hospitalised cohort in three different geographical areas did not find significant associations between number or duration of previous admissions and subsequent rehospitalisation rate in schizophrenia.

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