Transfers due to Physical Illnesses among Patients in the Chronic Psychiatric Ward

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Objectives: Patients with psychiatric diseases are more likely to have medical co-morbidities and increased mortality than those in the general population. Staff at psychiatric institutions face challenges in the aspect of medical care toward physical illnesses with limited medical resources, especially in the psychiatric chronic ward. In this study, we intended to examine the characteristics and related risk factors of transfers due to physical illnesses among individuals in the chronic psychiatric ward. Methods: This is a retrospective chart review study. We extracted records of transfers due to physical illness among the patients in the chronic psychiatric ward of Taoyuan Psychiatric Center from January 1, 2011 to June 30, 2013. Demographic data were also collected. Results: During the study period, 34.8% of the patients in the chronic psychiatric ward were ever transferred due to physical illnesses. Of 455 episodes of transfers, 22.7% of them visited emergency department at least once and 7.8% of them suffered from at least one general medical hospital admission. The most common diagnosis of transfers and further general medical hospital admission was pneumonia. Elder age (adjusted odds ratio = 1.04, 95% confidence interval = 1.02 - 1.06, \( p < 0.001 \)) and schizophrenia diagnosis (AOR = 3.63, 95% CI = 1.51 - 8.68, \( p < 0.01 \)) were significantly associated with higher emergency department transfers. Further, elder age (AOR = 1.03, 95% CI = 1.01 - 1.06, \( p < 0.05 \)) and smoking history (AOR = 2.71, 95% CI = 1.23 - 5.97, \( p < 0.01 \)) were also significantly associated with higher risk of pneumonia. Conclusion: High prevalence of medical transfers due to physical illness was found among the chronic psychiatric ward. Studies further focusing on the physical health among the chronic ward was mandated. Programs for enhancing psychical health, early prevention and detection of physical diseases among individuals in the chronic psychiatric ward are needed.

Key words: chronic psychiatric ward, physical illness, transfers, risk factors

Introduction

Previous published papers have shown that age-adjusted annual mortality rates from all causes among psychiatric patients are higher than those in the general population, possibly being due to the higher rates of physical disorders across the entire range of patients with mental disorders [1-4]. Smoking, poor diet, sedentary lifestyle, and low socioeconomic class, are more common in the psychiatric patients and contribute to their poor physical health [5]. Side effects of treatment have also increased health risk in patients with mental illness. Previous studies have demonstrated that the use of either first- or second-generation antipsychotic drugs is associated with body weight gain as well as increased blood glucose and cholesterol [6, 7]. Furthermore, symptoms of mental illness can be caused or worsened by underlying medical illnesses [6, 8].

Despite the high rates of mortality and elevated rates of comorbid medical conditions, detection and treatment of physical illnesses in psychiatric patients are inadequate [9]. An estimate of 30% to 47% of psychiatric patients with physical illness does not receive medical treatment [9, 10]. Factors contributing to the inadequacy of medical treatment among the people with mentally ill include hesitancy to seek medical care due to social withdrawal, aggressive or uncooperative behavior in the office, and primary care physicians’ attitudes [8, 11]. Previous studies also showed that patients who are mentally disturbed cannot give a clear account of their symptoms and increased difficulty in medical assessment [12]. In many cases, physical diseases are not correctly diagnosed and treated even when a patient is admitted to a psychiatric unit [13, 14], potentially resulting in having serious impact towards patients’ overall health, delaying recovery, and increased length of hospitalization.

For many psychiatric patients, hospitalization in mental health facilities may be their only chance to receive care for physical conditions. But, medical care provided to psychiatric inpatients is highly variable in each psychiatric institute. The staff to patient ratio in chronic psychiatric ward is lower than that in acute ward setting. Studies on patients’ physical illnesses in chronic psychiatric wards are also limited. To assess and to review the prevalence and categories of physical illnesses occurring in patients on chronic psychiatric wards are important to facilitate further improved care for the patients.

Up to our best knowledge, published studies on patients’ characteristics and the risk factors of transfers due to physical illness are lacking in Taiwan among the patients in chronic psychiatric wards. In the current study, we intended to study patients’ characteristics of transfers due to physical illness among the patients on chronic psychiatric wards, and to examine the associated underlying risk factors of transfers.

Methods

Study setting

This study was conducted at the Taoyuan Psychiatric Center (TYPC), a public, regional teaching hospital in the northern Taiwan, providing service of 282 acute beds, 380 chronic beds, and 300 day-care “beds.” TYPC is closely connected with a general hospital (Taoyuan General Hospital) where can provide convenient and timely medical services. Being retrospective in nature, the study proposal was approved by our local institutional review board, without the need to obtain the informed consent from the study patients.
**Study design**

This is a retrospective study. We collected data from medical records of patients hospitalized in the chronic psychiatric ward in TYPC from January 1, 2011 to June 30, 2013, who were ever transferred to other general hospital or medical clinics due to physical illnesses. In TYPC, there are no embedded medical services to the psychiatric inpatient wards. The chronic psychiatric wards accepted patients who had residual psychiatric symptoms and whose general medical needs can ordinarily be treated at an outpatient clinic. The patients with medical conditions who cannot be managed in the psychiatric setting, are transferred to the general hospitals or medical clinics.

**Study variables and data extraction**

We collected related study variables from the electronic medical information system and chart records of TYPC, where has an electronic medical information system established in January 2000. Data from this system are transformed into a relational database, referred to as the data “warehouse.” We extracted study data from the warehouse and created our analytic dataset with Statistical Package for Social Science software (SPSS, Inc., Chicago, Illinois, USA). By reviewing the clinical chart records, we extracted both patients’ demographic data (including sex, age, psychiatric diagnosis, underlying systemic medical disease, smoking, alcohol dependence history, and substance abuse history), as well as patients’ information of the transfers (including chief complaints, service departments of transfers, and the final diagnosis of transfers). A study nurse with a more than 10-year experience in psychiatric research extracted the data. The first author (HCH), a board-certificated psychiatrist, had regular supervisions and discussions on the chart records and extraction results.

The informations of the transfers were examined and categorized. We also examined the demographic data to see if any underlying risk factors existed to be associated with the transfer demographic and clinical characteristics, including age, sex, psychiatric diagnoses (schizophrenia or non-schizophrenia), histories of smoking, substance abuse, alcohol dependence, hypertension, and diabetes mellitus.

Due to the long hospitalization course of patients on the chronic wards, different transfers tended to be different disease events. Patients with repeated transfers for the same transfer diagnosis had different symptom intensities and different outcomes (hospitalization or not) during each transfer visits. Therefore, we counted transfer episodes instead of persons of transfers in this study to calculate the factors associated with the characteristics of transfers.

**Statistical analysis**

Categorical variables were compared using Chi-square and Fisher’s exact test, and continuous variables were compared using independent t test. Multivariate logistic regressions models were further tested for examining the risk factors of various medical transfers. We included covariates in the multivariate logistic regression model if we deemed them to be of clinical significance, such as age, gender and physical conditions, or if they had a univariate p-value less than 0.05. Adequacy of the multivariate models was assessed by the Homer-Lemeshow goodness-of-fit test. Three outcome variables which were chosen for logistic regression included (A) status of emergency visits, (B) presence of a pneumonia diagnosis, and (C) status of general hospital admission. All results were expressed as means and standard deviations.

All statistical analysis in this study was performed using Statistical Package of Social Science
software version 18.0 for Windows (SPSS, Inc., Chicago, Illinois, USA). The differences between the groups were considered significant if $p$-values were smaller than 0.05.

**Results**

There were 489 patients hospitalized on the chronic psychiatric wards from January 1, 2011 to June 30, 2013 at TYPC. At the same time, 170 patients were ever transferred due to physical illnesses, resulting in 455 transfers during the study period.

Table 1 lists patients’ demographic data and baseline clinical characteristics of the 170 participants. Table 2 shows top ranked characteristics of transfer use ($N = 455$). Table 3 is logistic regression model between demographic data and char-
characteristics of transfers. And Table 4 shows the seasonal pattern of the transfer diagnoses.

Among 120 transfer episodes of our study patients, top ranked transfer diagnoses more than or equal to 5 episodes were pneumonia (n = 10), epilepsy (n = 10), hyper-/hypotension (n = 10), urinary tract infection (n = 10), acute gastroenteritis (n = 8), upper respiratory infection (n = 5), and peptic ulcer (n = 5).

**Discussion**

To our best knowledge, this is the first study focusing on the transfers due to physical illnesses.
in the patients hospitalized on the psychiatric chronic ward in Taiwan. In this study, we found that high rate (34.8%) of our patients were ever transferred to general hospital or medical clinics. Around 23% of the patients visited emergency department due to physical illness at least once, and 7.8% of them suffered from at least one general hospital admission after transfers. As shown in Table 1, the top three underlying systemic diseases among the patients transferred were hypertension (25.1%), diabetes (11.3%), and seizures (11.3%). Of 455 transfers (Table 2), the most common service department transferred to was emergency department (54.3%). As shown in Table 2, the most common diagnoses of transfers were pneumonia (13.2%), gastroenteritis (10.5%), and upper respiratory tract infection (6.4%). The most common diagnoses of further general hospital admission were pneumonia (33.3%), ileus (13.0%), and urinary tract infection (7.4%). The results of this study are valuable with important clinical implications.

Published papers on physical illnesses among individuals on the psychiatric wards have been limited. One study conducted in psychiatric hospitals of London showed that 10.4% of psychiatric admission episodes include at least one night in a general hospital, and that 12.0% of psychiatry ad-

Table 3. Logistic regression model between baseline demographic data and characteristics of transfers

<table>
<thead>
<tr>
<th>Variables</th>
<th>Emergency visits</th>
<th>Pneumonia diagnosis</th>
<th>General hospital admission</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
<td>OR (95% CI)</td>
</tr>
<tr>
<td>Age</td>
<td>1.04 (1.02-1.06)**</td>
<td>1.03 (1.01 - 1.06)*</td>
<td>1.02 (0.99-1.04)</td>
</tr>
<tr>
<td>Sex</td>
<td>1.13 (0.74-1.71)</td>
<td>1.77 (0.96 - 3.27)</td>
<td>1.54 (0.82-2.88)</td>
</tr>
<tr>
<td>Schizophrenia diagnosis</td>
<td>3.63 (1.51-8.68)**</td>
<td>0.998 (0.08 - 7.22)</td>
<td>2.70 (0.58-12.71)</td>
</tr>
<tr>
<td>Smoking</td>
<td>0.55 (0.30-1.01)</td>
<td>2.71 (1.23 -5.97)**</td>
<td>0.82 (0.31-2.19)</td>
</tr>
<tr>
<td>Alcohol dependence</td>
<td>0.79 (0.34-1.85)</td>
<td>0.992 (0.20 - 4.49)</td>
<td>0.78 (0.21-2.99)</td>
</tr>
<tr>
<td>Substance abuse</td>
<td>1.52 (0.58-4.00)</td>
<td>1.11 (0.30-4.06)</td>
<td>0.995 (0.19-5.18)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>0.90 (0.54-1.49)</td>
<td>1.33 (0.66 - 2.68)</td>
<td>2.24 (1.14-4.38)*</td>
</tr>
<tr>
<td>Diabetes</td>
<td>0.56 (0.29-1.09)</td>
<td>1.09 (0.45-2.68)</td>
<td>0.44 (0.14-1.36)</td>
</tr>
</tbody>
</table>

*p < 0.05; **p < 0.01; ***p < 0.001
OR, odd ratio; CI, confidence interval

Table 4. Seasonal patterns of the transfer diagnosis

<table>
<thead>
<tr>
<th>Transfer diagnosis</th>
<th>Spring N (%)</th>
<th>Summer N (%)</th>
<th>Fall N (%)</th>
<th>Winter N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>4 (3.5)</td>
<td>8 (7.5)</td>
<td>2 (2.1)</td>
<td>15 (10.9)</td>
</tr>
<tr>
<td>No</td>
<td>110 (96.5)</td>
<td>99 (92.5)</td>
<td>94 (97.9)</td>
<td>123 (89.1)</td>
</tr>
<tr>
<td>URI***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2 (1.8)</td>
<td>0 (0)</td>
<td>2 (2.1)</td>
<td>21 (15.2)*</td>
</tr>
<tr>
<td>No</td>
<td>112 (98.2)</td>
<td>107 (100)</td>
<td>94 (97.9)</td>
<td>117 (84.8)</td>
</tr>
<tr>
<td>AGE***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10 (8.8)</td>
<td>22 (20.6)</td>
<td>8 (8.3)</td>
<td>8 (5.8)</td>
</tr>
<tr>
<td>No</td>
<td>104 (91.2)</td>
<td>85 (79.4)</td>
<td>88 (91.7)</td>
<td>130 (94.2)</td>
</tr>
</tbody>
</table>

*p < 0.05; **p < 0.01, ***p < 0.001
URI, upper respiratory infection; AGE, acute gastroenteritis.
mission episodes took place after an emergency department visit [15]. The most frequent general hospital discharge diagnoses for those transferred from a general adult psychiatric setting are poisoning, diseases of the respiratory system, and injuries [15]. One study conducted in Sacramento County Mental Health Center in California, USA over a period of 30 months showed that 2.1% psychiatric admission has been referred to general hospital admission, and that the most common diagnoses of general hospital admission are pneumonia, urinary tract infection, and electrolyte imbalance [16]. Another study in New York City revealed that among individuals in inpatient psychiatric hospitals, 14.4% are transferred to a general hospital [17]. That study results showed that febrile illnesses, acute neurological changes, and falls with head trauma are the most common reasons for transferring psychiatric inpatients to the general hospital, and that infections (pneumonia, cellulitis, pyelonephritis, HIV infection, subphrenic abscess, and sepsis) are the largest group of conditions requiring admission [17]. Similar to our study at TYPC, the above cited studies are also all conducted from free-standing psychiatric hospitals [15-17]. But differing from our study on chronic ward patients, all other studies include acute stage psychiatric patients. The reason of much higher transfer rates to the emergency in our study may be due to the different ward settings and cares. The settings of acute psychiatric hospitalizations may also result in increasing incidence of poisoning and injury due to active psychiatric symptoms. In the above published studies [15-17], the transfers have been limited to the emergency department of general hospital. Therefore, the incidence of minor physical diagnoses may have been decreased.

As for the risk factors for transferring to emergency department of general hospital among patients in the psychiatric hospitals, one previous study showed that transferred and not-transferred groups are different in being older age, presence of dementia, number of comorbid medical disorder, as well as histories of arterial hypertension, blood urea nitrogen, creatinine, albumin, glucose, calcium, hemoglobin, and hematocrit abnormalities [17]. In the community setting, emergency department use among people with serious mental disorder was negatively associated with older age, but positively associated with the number of co-occurring medical conditions, smoking, recent injury, and recent change in health care provider [18]. In our study (Table 3), elder age ($p < 0.001$) and the diagnoses of schizophrenia ($p < 0.01$) were significantly to be positively related with emergency department transfers among patients hospitalized in the chronic psychiatric ward. The finding of positive correlation of elder age is compatible with a previous inpatient study [17]. On the other hand, our data (Table 3) showed that patients with the diagnosis of schizophrenia had significantly more risk of emergency department transfers, compared to patients with other psychiatric diagnosis (OR = 3.63, 95% CI = 1.51 - 8.68, $p < 0.01$). This result differs from a previous inpatient study conducted in a free-standing psychiatric hospital in New York, showing that only the diagnosis of dementia is correlated to the transfers to general hospitals [17]. In one study, emergency visits for somatic reasons among the individuals with severe mental disorder in the community setting are not different among various psychiatric groups, including schizophrenic disorder, affective disorder, paranoid disorder, and anxiety disorder [19]. The reasons of these disparities may be due to the different psychiatric diagnosis distribution among the community setting, acute psychiatric ward and chronic psychiatric ward. In our chronic psychiatric ward (Table 1), we did not
transfer any patients with anxiety disorder or those with dementia during this period. It is also possible that patients with schizophrenia, compared to mood disorder, both in the stage of less active psychiatric symptoms have more negative symptoms, resulting in poorer self-care ability. Why schizophrenia diagnosis did increase significantly more risk of emergency department transfers among the chronic psychiatric ward (Table 3), warrants further investigation.

Our study (Table 3) revealed that elder age ($p < 0.05$) and smoking history ($p < 0.01$) were significantly correlated to the pneumonia diagnosis among individuals in our chronic psychiatric ward. The findings are compatible with previous published data from studies in general population [20, 21]. Although all individuals stopped smoking after hospitalization to our chronic psychiatric ward, according to the hospital policy, their history of smoking still remained to have significant association ($p < 0.01$) with the diagnosis of pneumonia (Table 3). Previous studies in general population revealed that smoking cessation can decrease the risk of pneumonia, but the risk is dependent on the duration of cessation and whether patients have recognized chronic obstructive pulmonary diseases [22]. Previous studies also show that psychiatric inpatients have higher rates of smoking than those in the general population [23]. Furthermore, the high rate of smoking among the mentally ill constitutes a major public health problem [24]. Thus, to enhance smoking cessation in early life, especially towards the mentally ill patients is an important issue.

In this study (Table 4), the occurrences of influenza ($p < 0.05$), upper respiratory infection ($p < 0.001$), and acute gastroenteritis ($p < 0.001$) were significantly correlated with different seasons. Flu and upper respiratory infection occurs most frequently in the winter, while acute gastroenteritis occurs most frequently in the summer. The findings are compatible with reports in epidemiologic data of diseases in the general population [25, www.cdc.gov.tw].

**Study limitations**

The readers are warned against over-extrapolating the study results because it has three major limitations.

- This study is retrospective in nature.
- We included the data of patients from one single psychiatric center. The findings from this study may not be generalized to other chronic psychiatric wards because of differences in local practice patterns.
- We did not collect the profiles of psychotic/anxiety/depressive symptoms, negative symptoms, current life style factors, medication side effects, and cognitive functions.

It is difficult for us to further investigate probable mechanisms explaining the risk factors of the medical transfers. We suggest that future studies with improved study designs to address those limitations.

**Summary**

High prevalence of transfers due to physical illness was noted among the psychiatric chronic ward in this study. It is a challenge for staff on chronic psychiatric wards. Studies further focusing on the physical health among patients on the chronic psychiatric wards are mandatory. Programs for enhancing psychical health, early prevention, and detection of physical disease among individuals in the psychiatric wards are needed.

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