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Brief report

Healthcare utilization patterns before and after contact with psychiatrist care for panic disorder

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ABSTRACT

Background: This study aimed to examine healthcare utilization and expenditures in the six months before and after a patient contacted with psychiatrist care for panic disorder (PD), using a nationwide population-based database in Taiwan.

Methods: We used data from Taiwan's National Health Insurance Research Database covering the years 2002 to 2005. Our study sample included 15,374 patients with PD. We compare changes in the number of ER and outpatient visits and associated six months before and after a patient received psychiatric treatment for PD, by performing paired *t*-tests.

Results: Results indicate that despite increased mean numbers and costs for total and psychiatric outpatient visits after patients contacted with psychiatrist care for PD, there was a significantly lower number of emergency visits (0.86 vs. 0.62, $p<0.001$) and non-psychiatric outpatient visits (16.1 vs. 15.6, $p<0.001$) after psychiatric treatment, saving NT$452.8 and NT $312.9 dollars, respectively. Furthermore, we found that the mean monthly ER use and costs demonstrated a steadily upward trend peaking in the month prior to contacting with psychiatrist care for PD, followed by a sharp decrease in the month after.

Limitation: We identified patients diagnosed with PD by ICD-9-CM codes from administrative claims data, the validity of diagnoses could be compromised.

Conclusion: The treatment of PD might cause an increase in healthcare expenditures for psychiatric visits; nevertheless, it would also reduce utilization of medical resources for symptoms associated with PD. Our study highlights the need to target PD for early identification and treatment.

1. Introduction

Panic disorder (PD) is a psychiatric condition characterized by recurrent unexpected panic attacks associated with a high incidence of medically unexplained symptoms (American Psychiatric Association, 1994; Katon et al., 1990; Bandelow et al., 2008). Epidemiological studies indicate that the 1-year and lifetime prevalence rates of PD are 0.5–1.5% and 1–2%, respectively (American Psychiatric Association, 2000).

Although several safe and effective treatments are available (Klosko et al., 1990; Shear et al., 1994), many individuals with PD do not receive appropriate care. Specifically, because of frightening medical symptoms such as chest pain and shortness of breath, patients with PD commonly seek care from a primary care provider or emergency departments (EDs), rather than going to a psychiatric setting for assessment (Simon and VonKorff, 1991). Many are not screened for PD and do not receive a diagnosis, appropriate treatment, or psychiatric referral for the condition (Fleet et al., 1996; Yingling et al., 1993).

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Thus, the high rate of medical help-seeking behaviors among patients with undiagnosed PD is one explanation given for the high use of medical services (David and Neale, 1990). Epidemiologic studies (Simon, 1992; Katerndahl and Realini, 1997; Simpson et al., 1994) indicate that PD patients are likely to make six or more visits to general medical services and to be heavily represented among patients classified as high health care utilizers, compared with other psychiatric or nonpsychiatric groups. Not surprisingly, high utilization rates are associated with greatly increased expenditures for medical services.

There is evidence that providing psychiatric care for mentally ill persons subsequently reduces their use of nonpsychiatric services. Some studies have addressed changes in healthcare utilization and costs following initiation of mental health treatment (Borus et al., 1985; Hankin et al., 1983; Mumford et al., 1984). One recent study reported that selective serotonin reuptake inhibitor (SSRI) treatment for PD was associated with a reduction in the mean number of ER visits and laboratory tests and associated costs (Roy-Byrne et al., 2001). Similarly, Salvador-Carulla et al. (1995) found that a 94% reduction in the use of nonpsychiatric health services followed provision of appropriate psychiatric or psychological care to PD patients.

While the studies above have shown that appropriate treatment may decrease unnecessary resource utilization for symptoms associated with PD, these studies have been few and have small clinical samples, limitations that clearly undermine the strength of the findings. The aim of this study was to examine medical service utilization and expenditures six months before and after patients contacted with psychiatrist care for PD, employing a nationwide population-based database from Taiwan covering a four-year period.

2. Methods

2.1. Database

This study used data from the National Health Insurance Research Database (NHIRD) in Taiwan covering the years 2002 to 2005. Taiwan initiated the National Health Insurance (NHI) program in 1995 to finance health care for all citizens of Taiwan. Taiwan's NHI has a unique combination of characteristics, universal coverage, a single-payer payment system with the government as the sole insurer, comprehensive benefits and access to any medical institution of the patient's choice. There are currently over 21 million people, about 97% of Taiwanese citizens, enrolled in the NHI program.

2.2. Study sample

The study sample was extracted from outpatient claims data by a principal diagnosis of PD (ICD-9-CM code 300.01) between January 2004 and December 2004. In order to compensate for the chronicity of this disorder, we excluded patients who had been diagnosed with PD during the period from 2002–2003. In addition, in order to ensure the validity of the PD diagnoses, we required that all sampled patients have at least two consensus PD diagnoses after the index outpatient visit. Ultimately, our study sample included 15,374 patients with PD.

2.3. Variables of interest

Dependent variables of interest included the number of ER visits, the number of outpatient visits, costs accrued for ER visits and costs accrued for outpatient visits. We compare changes in the variables of interest six months before and after contacting with psychiatrist care for PD. Data on patient characteristics at the time of the index outpatient visit, including gender, age, monthly income, geographic region, place of residence (urbanization level) as well as comorbid medical disorders (hypertension, diabetes, hyperlipidemia, COPD, ischemic heart disease and renal disease), were also described. Urbanization levels in Taiwan are divided into five strata, based on prior studies in Taiwan, with level 1 referring to the 'most urbanized' and level 5 referring to the 'least urbanized' communities.

2.4. Statistical analysis

The SAS statistical package (SAS System for Windows, Version 8.2) was used to perform the analyses in this study. Paired *t*-tests were performed to examine whether or not there were mean differences in ER and outpatient service costs and utilization six months before and after contacting with psychiatrist care for PD in a psychiatric department. A two-sided *p* value of less than or equal to 0.05 was considered to be statistically significant.

3. Results

Table 1 shows the distributions of demographic characteristics and comorbid medical disorders for the study sample. As expected, a substantial majority of PD patients were female (63.18%). The mean age of the study sample was 45.0 years, with a standard deviation 14.7. A total of 27.98%, 9.65%, 14.90%, 3.04%, 1.68% and 15.71% had hypertension, diabetes, hyperlipidemia, renal disease, ischemic heart disease, and COPD, respectively. In addition, 0.78%, 3.61%, 3.40%, and 0.21% had schizophrenia, bipolar disorder, depressive disorder and substance abuse, respectively.

Within six months prior to contacting with psychiatrist care for PD in a psychiatric department, the mean total number of ER visits was 0.86 and ER costs were NT$1500. Within six months after receiving treatment for PD in a psychiatric department, the mean number of ER visits decreased to 0.62 and ER costs dropped to NT$1047. Paired *t*-tests shows that there were significant differences in the mean total number of ER visits and costs before and after contacting with psychiatrist care for PD (both $p<0.001$). Nevertheless, after contacting with psychiatrist care for PD, the mean number of outpatient visits was significantly higher than prior to contacting with psychiatrist care for PD (17.6 vs. 19.1, respectively, $p<0.001$). Similarly, the mean costs of outpatient visits significantly increased after contacting with psychiatrist care for PD (NT$15,091 vs. NT$17,556, respectively, $p<0.001$).

Furthermore, paired *t*-tests show that the mean costs of outpatient visits to a psychiatric department significantly increased after contacting with psychiatrist care for PD (NT $2227 vs. NT$5005, respectively, $p<0.001$). At the same time, the mean number of outpatient visits to psychiatric

Table 1
Demographic characteristics and comorbid medical disorders of patients with PD in Taiwan, 2004 ($n = 15,374$).

Variable	Patients with PD	
	Total no.	Column %
Gender		
Male	5661	36.82
Female	9713	63.18
Age (years)		
<45	8080	52.56
45–64	5553	36.12
>65	1741	11.32
Hypertension		
Yes	4302	27.98
No	11,072	72.02
Diabetes		
Yes	1483	9.65
No	13,891	90.35
Hyperlipidemia		
Yes	2290	14.90
No	13,084	85.10
Renal disease		
Yes	468	3.04
No	14,906	96.96
Ischemic heart disease		
Yes	259	1.68
No	15,115	98.32
COPD		
Yes	2416	15.71
No	12,958	84.29
Urbanization level		
1	4799	31.22
2	4576	29.76
3	2046	13.31
4	1921	12.50
5	2032	13.22
Monthly income		
0	3474	22.60
NT$1–15,840	3057	19.88
NT$15,841–25,000	5425	35.29
≥NT$25,001	3418	22.23
Geographic region		
Northern	7751	50.42
Central	3744	24.35
Southern	3,574	23.25
Eastern	305	1.98

department also went significantly up after contacting with psychiatrist care for PD (1.56 vs. 3.50, respectively, $p<0.001$). Interestingly, both the mean number (16.1 vs. 15.6, $p<0.001$) and costs (NT$12,865 vs. NT$12,552, respectively, $p=0.011$) of outpatient visits to non-psychiatric departments significantly decreased after contacting with psychiatrist care for PD (Table 2).

4. Discussion

To the best of our knowledge, this is the first nationwide population-based study to examine the utilization of medical services and associated costs for patients prior to and after contacting with psychiatrist care for PD. We found that the treatment of PD could cause expenditures to increase due to psychiatric visits; nevertheless, it might reduce the use of medical resources for symptoms associated with PD. Specifically, despite increased mean numbers of total and psychiatric outpatient visits and associated costs after contacting with psychiatrist care for PD, a significantly lower number of emergency visits and non-psychiatric outpatient visits (0.236 less and 0.523 less, respectively) was observed after treatment. Psychiatric treatment for PD consequently decreased expenditures on emergency and non-psychiatric outpatient visits by NT$452.8 dollars and NT $312.9 dollars, respectively.

Our findings are in line with observations by Salvador-Carulla et al. (1995) in Spain. They recruited 61 people over a 24-month period to compare medical costs and productivity losses before and after treatment for PD. They, too, found that total medical costs increased following adequate treatment. However, when both medical costs and work-losses were considered, psychiatric treatment reduced overall societal costs associated with PD while improving the patient's quality of life significantly (Salvador-Carulla et al., 1995). Similarly, Roy-Byrne et al. (2001) used the publicly available HCIA medical and pharmacy claims database to analyze ER and laboratory resource utilization and costs for 120 patients with PD. They found that appropriate treatment for PD with selective serotonin reuptake inhibitors (SSRIs) may reduce in the utilization of ER and laboratory services and associated costs. However, the studies above have been restricted to small clinical samples, undermining their statistical power. Our population-based study therefore extends the findings in the previous literature.

It has been well documented that patients with untreated PD are frequently heavy utilizers of medical services, compared with other psychiatric or nonpsychiatric patients, and typically seek care in primary care settings (Wulsin et al.,

Table 2
Mean medical care utilization and costs before and after contacting with psychiatrist care for PD.

Variable	Receiving treatment in the psychiatric department			
	Before [a]	After [b]	Diff [c]	*P* value [d]
	Mean (SD)	Mean (SD)	Mean (SD)	
Cost				
Total outpatient costs	15,091 (21,828)	17,556 (23,361)	2465.4	<0.001
Outpatient costs in psychiatric department	2227 (6137)	5005 (8033)	2778	<0.001
Outpatient costs in non-psychiatric department	12,865 (20,746)	12,552 (21,957)	−312.9	0.011
Emergency department costs	1500 (3643)	1047 (3282)	−452.8	<0.001
Utilization				
Total number of outpatient visits	17.6 (14.9)	19.1 (15.2)	1.418	<0.001
Number of outpatient visits to psychiatric department	1.56 (3.51)	3.50 (4.81)	1.941	<0.001
Number of outpatient visit number to non-psychiatric department	16.1 (14.2)	15.6 (14.5)	−0.523	<0.001
Number of emergency department visits	0.86 (2.02)	0.62 (2.15)	−0.236	<0.001

Note: SD = standard deviation; US$1.00 = NT$33.00 in 2004.
[a] Six months before receiving the treatment of panic disorder.
[b] Six months after receiving the treatment of panic disorder.
[c] Diff = After–Before.
[d] Performed by paired *t*-test.

1991; Buller et al., 1992) or emergency departments (Katerndahl and Realini, 1997). Indeed, we found that before receiving treatment for PD in the psychiatric department, patients present more frequently to medical clinics rather than to psychiatric settings for assessment. Specifically, in the six months before a diagnosis of PD, the mean number of outpatient and ER visits (17.6 vs. 0.86, respectively) was relatively high. In 2003 the annual number of visits to outpatient clinics and emergency medical services within the NHI was only 11.32 and 0.23 per capita in Taiwan, while Americans had on average 5.8 visits in 1996. Although such patients frequently appear in primary care settings, PD is significantly under-recognized by medical providers (Barsky, Delamater, & Orav, 1999; Fifer et al., 1994; Stein et al., 1999; Harman et al., 2001) often going without appropriate diagnosis, treatment, or psychiatric referral (Fleet et al., 1996; Yingling et al., 1993). Because of the social stigma associated with psychiatric treatment, primary care physicians may hesitate to make a psychiatric referral unless negative findings are displayed through a comprehensive medical examination. This conservative procedure adopted by physicians together with the physical symptoms and help-seeking behaviors observed among PD patients contribute to higher medical costs, due to under-diagnosis. Ultimately, the distressing illness of PD, in addition to increasing healthcare costs, if left untreated, causes considerable social, personal, and domestic disability and elevates the risk of substance abuse, depression and suicide (Federici and Tommasini, 1992).

Our findings have several implications. The NHI in Taiwan has succeeded not only in providing universal coverage, but also in supplying extensive insurance benefits and a wide range of contracted healthcare facilities. However, because there is no referral system in Taiwan, patients with PD have unlimited free choice of physicians and healthcare facilities. They are sometimes criticized for “doctor-shopping” behavior in their attempt to ascertain reasons for their recurrent and unexplained medical symptoms. On the one hand, policy makers should consider an operative referral system, with effective sharing of medical records between healthcare facilities. On the other hand, general practitioners should be more intensively informed, emphasizing the interaction between panic disorder and medical symptoms due to physical illness. They are encouraged to advise or arrange psychiatric consultations for patients with potential PD. Early identification of individuals with PD would allow prompter referral for appropriate treatment. In addition, the well-being and quality of life of the patients with PD should increase when they do not have ER visits anymore.

Two inherent limitations of administrative datasets merit note. First, because we identified patients diagnosed with PD by ICD-9-CM codes from administrative claims data, the validity of diagnoses could be compromised. In order to ensure the validity of the PD diagnoses, we only included patients who had at least two consensus PD diagnoses during the study period as our study sample. Secondly, because patients with true PD may be misidentified as non-PD cases if they do not seek appropriate medical care, misclassification would likely bias our results towards the null.

5. Conclusion

In conclusion, we found that the treatment of PD may cause an increase in expenditures due to psychiatric visits, but decrease emergency and non-psychiatric resource utilization for symptoms associated with PD. These findings highlight the need to actively target PD for early intervention.

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Conflict of interest
No conflict of interest to declare for all authors.

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