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Health Resource Utilization and Comorbidities in Patients with Mental Disorders: Analysis Based on Health Insurance Claim Data

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Abstract

The number of patients with mental disorders is increasing all over the world and they have a high prevalence of physical complications. To analyze and compare the cost of mental disorders with the total medical costs such as mental disorders and physical disorders, we analyzed the cost that patients with mental disorders incurred. We investigated the distribution of medical costs and the characteristics of diseases by using the health insurance claims of people in City A, Japan from March 2013 to February 2014. The subjects had one or more of 4 mental disorders: schizophrenia, alcohol related disorders, bipolar disorder, and depressive episode. As a result, the total number of patients who met inclusion criteria per year was 7403 (6522 outpatients and 881 inpatients). It was revealed that the hospitalization rate of patients with mental disorders increased with age, and many inpatients stayed in hospital for a long time. Also, it was revealed that many patients with mental disorders were in complicated condition with more than one mental or physical disorders and incurred medical costs for these comorbidities. In conclusion, this analysis indicated that many patients with mental disorders switch from attending the outpatient department to hospitalization as they become older. Further, they incurred a lot of medical expenses for complication management. To improve their QOL, comprehensive assessment of their mental/physical health, self-management education, coordination of services, and support for decision making regarding treatment are necessary.

Keywords

Mental Disorder, Medical Cost, Comorbidity

1. Introduction

The number of patients with mental disorders is increasing across the world. A

report from the World Health Organization (WHO) described that lifetime prevalence of mental problems is about 20% to 35% [1] [2]. A survey conducted in Japan by the Ministry of Health, Labour and Welfare in 2014 estimated that 533 thousand patients (total of inpatients and outpatients) were diagnosed to have any of the mental and behavioral disorders (ICD 10 Code, F00 to 99) [3]. Kawakami et al surveyed 1663 Japanese persons in the several regions and found that 2.9% and 1.6% of them had major depression and alcohol abuse/dependence, respectively, in the previous 12 months [4].

Mental problems often need long time treatment. For example, 40% to 60% of the patients with schizophrenia suffer from lifelong disorder [5]. Regarding health resource utilization, the rate of hospitalization in Japan is higher for mental and behavioral disorders than others, and the period of hospitalization exceeds 1 year for 12.8% of hospitalized patients. Among OECD countries, the number of psychiatric hospital beds is the highest and the hospitalization days are the longest in Japan [2]. Furthermore, the social scenario indicates a high prevalence of depression and schizophrenia in the person who committed suicide [6] [7].

Many studies in and outside of Japan have analyzed the medical and societal costs of mental disorders [8]-[14]. In these analyses, only the cost of mental disorders was analyzed. But clinically, many patients with mental disorders have physical disorders as well. It is reported that the co-existence of mental and physical disorders leads to poor control of mental conditions, insufficient management of physical disorders, and low QOL of the patients [15] [16] [17] [18]. In order to improve the cost/benefit of treatment and quality of medical services for these patients, the conditions of concurrent physical disorders have to be addressed. Also, the necessity of preventing aggravation and acute phase treatment for physical disorders can be minimized in addition to discussions about the number of beds.

However, few reports have analyzed the physical comorbidities of the patients with mental disorders or the places where they have received treatment. This is a limitation of the patient surveys conducted by the Ministry of Health, Labour, and Welfare and the analyses of medical cost based on health insurance claim data.

In the present study, we analyzed the cost of mental disorders by analyzing and comparing the cost for mental disorders with the total medical costs (including mental and physical disorders) incurred by patients who were diagnosed with mental disorders. To analyze the medical cost of each disease, we used a medical cost grouping technique to link disorders listed on the health insurance claim sheets to the drugs and/or interventions administered according to their medical indications. Based on these analyses, we tried to clarify the details of the medical cost of patients with mental disorders.

The study population is limited to the residents who are covered by national health insurance in one city. However, it is expected that patients with mental disorders will continue to increase, and the improvement of QOL in these pa-

tients is an important issue. By analyzing health resource utilization and physical comorbidities of patients with mental disorders, our study may contribute to the improvement of medical service and clarify the cost-benefit of treatment provided to these patients whose cost is partly paid by the insurer.

2. Methods

2.1. Subjects

The subjects analyzed in our study were the residents (age ≤ 74 years) of City A who were covered by national health insurance and suffered from one or more of 4 mental disorders that have the highest morbidity and lifetime prevalence among mental disorders: alcohol related disorders (ICD10 Code, F10), schizophrenia (ICD10, Code F20), bipolar disorder (ICD 10, Code F31), and depressive episode (ICD10 Code, F32). For the analysis of diseases of the hemodialysis patients, all persons covered by the national health insurance were included in the study.

Outline of persons covered in the national health insurance in City A (as of February 2014)

In total, 94,380 residents in City A were covered by the national health insurance. Among them, 47,150 (50.0%) were males and 47,230 (50.0%) were females. When grouped by age, the age group ranging 65 to 69 years accounted for the highest percentage (11,795 persons [12.5%]) in the residents covered by the national health insurance, followed by the age group 60 to 64 years (10,726 persons [11.4%]) and the 70 to 74 years age group (9,888 persons [10.5%]). Among all persons covered by the national health insurance, 23.2% were the elderly (age ≥ 65 years).

City A is a tertiary industry based local city. About 30% of the residents are covered by the national health insurance and 19.9% of the residents are the elderly in 2015. For 100 thousand residents in City A, there are 78.58 hospitals/clinics (national average [hereinafter same will be applied in this paragraph] 67.88), and among them, 12.84 (4.99) hospitals/clinics are specialized in psychiatry. Clinics have 127.73 beds (80.90), hospitals have 1012.73 beds (1215.00) and psychiatric hospitals/clinics have 230.09 beds (259.31). Psychiatric beds account for 22.7% of the total beds [19].

2.2. Study Design

Cross-sectional study.

2.3. Data Collection and Analysis

We collected data from health insurance claim sheets issued over 12 months (March 2013 to February 2014) and extracted and analyzed data on age, sex, date of use of health resource, disease, medical institution, days of use, and medical cost. There are 3 types of health insurance claim sheets: sheets for hospitalization cost, sheets for outpatient cost, and sheets for prescription cost. Each month, a sheet that describes the medical service provided and its cost for the previous

month is issued at each medical institution.

We analyzed the following particulars from the data: (1) relationship between the number of the patients and medical costs, (2) percentage of inpatients and days of hospitalization classified by hospital function classification, (3) details of physical comorbidities, and (4) diseases of patients on hemodialysis. The following 2 procedures were used for analysis. First, we used a medical cost grouping technique to analyze medical cost used for the target disorders only (4 mental disorders described above). For analysis of outpatient medical costs, medical charge of out-patient/prescription health insurance claim sheet was linked with diseases and summarized. If there were multiple diseases, costs were divided by the number of diseases and assigned equally to each disease. Medical charges that were not linked to any disease were assigned to the primary disease requiring outpatient clinic visits. The hospital costs listed on health insurance claim sheets were linked with the disease primarily responsible for hospitalization and summarized. If there were multiple diseases, costs were divided by the number of diseases and assigned equally to each disease. Second, all costs on the claim sheets of patients with target disorders were analyzed. Namely, the medical costs were analyzed regardless of the type of disease (mental and physical disease). Data used in this analysis were obtained from the insurer through opt-out procedure.

3. Results

The subjects included in our analysis were residents of City A who were covered by national health insurance and suffered from one or more of 4 mental disorders: schizophrenia (F20), alcohol related disorders (F10), bipolar disorder (F31), and depressive episode (F32).

3.1. Medical Cost Used for Treatment of Target Mental Disorders (Medical Cost Grouping)

First, we used a medical cost grouping technique to clarify the medical cost used for the 4 disorders as follows (Table 1). It should be noted that some patients were counted twice or more times because they had more than 1 disorder. The total number of patients per year was 7403 (6522 outpatients and 881 inpatients, with duplication). The medical cost was 1.02 billion yen for outpatients (approximately 80 thousand to 260 thousand yen per patient) and 2.24 billion yen for inpatients (approximately 1.05 million to 2.94 million yen per patient). Schizophrenia accounts for the highest percentage of this cost both for outpatients or inpatients.

Among the total medical costs used for the residents covered by national health insurance in City A, 7.2% was used for outpatients and 18.9% was used for inpatients for the above 4 mental disorders.

3.2. Total Outpatient Costs of Patients with Target Mental Disorders

Next, the total outpatient costs of the patients with one or more of the target

Table 1. Medical cost used for treatment of the target mental disorders.

Rank		Outpatient		
	Disease name (ICD10)	Total medical expenditure (yen)	Average medical fee/patient (yen)	Percentage of total medical expenditure
1	Schizophrenia (F20)	687,079,469	263,350	4.9%
2	Depressive episode (F32)	227,718,315	80,183	1.6%
3	Bipolar disorder (F31)	75,684,015	115,902	0.5%
4	Alcohol related disorders (F10)	32,394,473	77,130	0.2%
Rank		Inpatient		
	Disease name (ICD10)	Total medical expenditure (yen)	Average medical fee/patient (yen)	Percentage of total medical Expenditure
1	Schizophrenia (F20)	1,965,551,398	2,938,044	16.6%
2	Alcohol related disorders (F10)	121,245,783	1,289,849	1.0%
3	Bipolar disorder (F31)	81,340,333	1,730,645	0.7%
4	Depressive episode (F32)	74,601,997	1,050,732	0.6%

mental disorders were analyzed regardless of the disease (Figure 1 and Figure 2). The total outpatient costs of 1.37 billion yen were classified by sex and age groups.

In the period included in this analysis (1 year), 5,601 patients received treatment as outpatients (2650 males [47.3%] and 2,951 females [52.7%]). The age group that accounted for the highest percentage was the 60 to 69 years age group for both males and females (males 23.5% and females 22.3%). The age group that used the highest amount of medical cost per patient was the 40 to 49 years age group, which was approximately 390 thousand yen, followed by the 50 to 59 years age group and the 60 to 69 years age group. This amount was relatively higher than the outpatient cost per patient shown in Table 1, which indicates that the patients had multiple diseases for which they received treatment.

Regarding the medical cost used by each age group, the 40 to 49 years age group (20.9% of the total patients) used 33.1% of the total medical costs, followed by the 60 - 69 years age group (20.9% of the total patients) and the 50 - 59 years age group (20.9% of the total patients), which used 23.8% and 18.9%, respectively, of the total medical costs. The patients with target mental disorders used 9.8% of the total outpatient cost of the residents covered by national health insurance in City A. This was 2.6% higher than the percentage of medical cost obtained by the medical grouping technique for the 4 mental disorders.

The number of patients who were diagnosed with the target mental disorders (schizophrenia [F20], alcohol related disorders [F10], bipolar disorder [F31] or depressive episode [F32]) is summarized in Table 2. The most frequent disorder was depressive episode, followed by schizophrenia and bipolar disorder. Since the total number of outpatients was 5601, it was indicated that the patients with target mental disorders had more than one diagnosis of mental disorder.
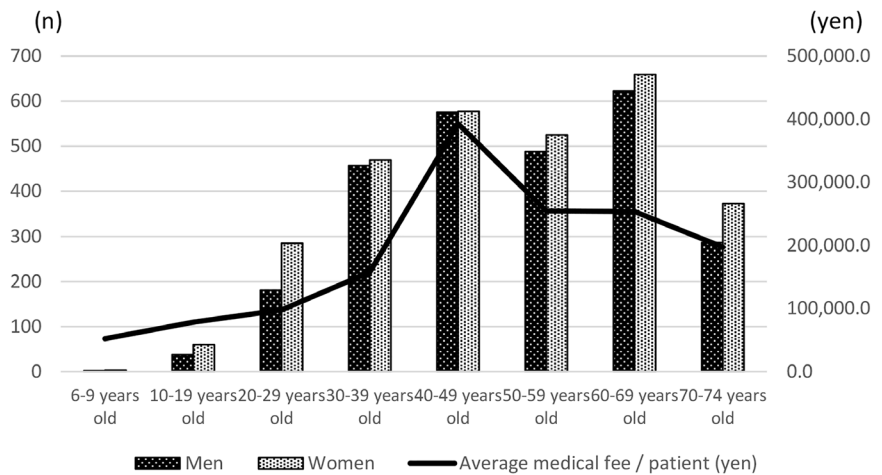
Figure 1. The number of outpatients and medical cost per patient.
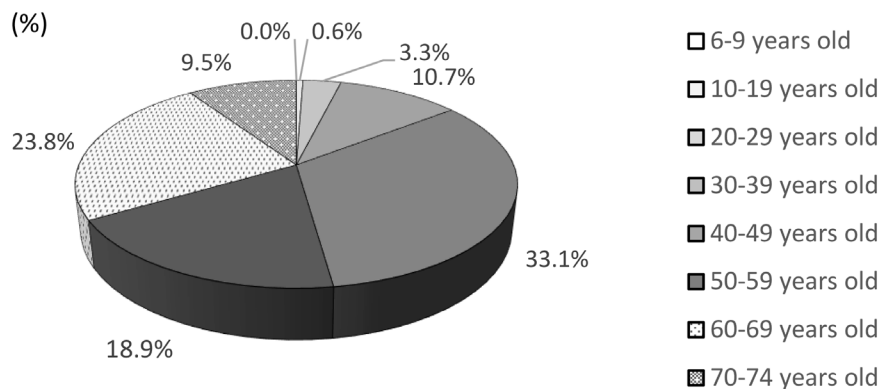
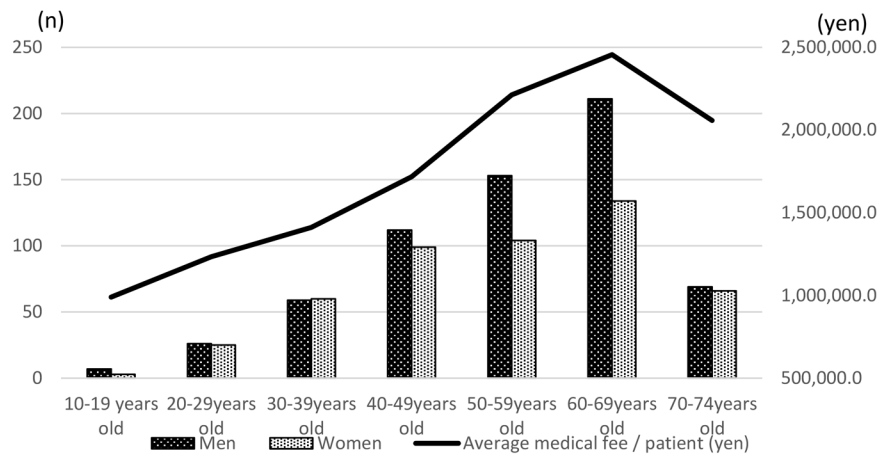**Figure 2.** Medical cost by age of outpatient.

Table 2. Diagnosis of outpatients.

Disease name (ICD10)	No. of patients	Percentage of total outpatients
Depressive episode (F32)	3237	43.4%
Schizophrenia (F20)	2887	38.7%
Bipolar disorder (F31)	738	9.9%
Alcohol related disorders (F10)	602	8.1%
Some patients with multiple diseases		

3.3. Total Inpatient Costs of Patients with Target Mental Disorders

Next, the health insurance claim data were analyzed to determine the cost for hospitalization due to one or more of the target mental disorders (4 ICD 10 code names specified above) (**Figure 3**, **Figure 4**). The total hospitalization costs were 2.3 billion yen. The breakdown of this total amount by sex and age group is as follows.

In the period included in this analysis (1 year), 1128 patients were hospitalized in total (637 males [56.5%] and 491 females [43.5%]). The age group that

Figure 3. The number of inpatients by age group and medical cost per patient.
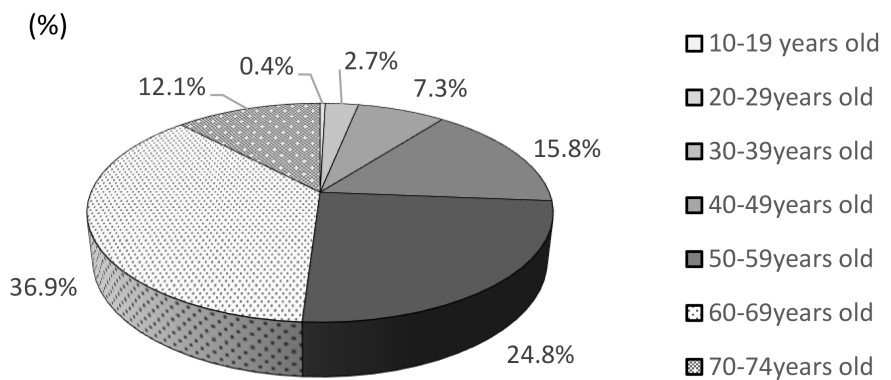
Figure 4. Inpatient medical cost by age group.

accounted for the highest percentage of inpatients was the 60 to 69 years age group (males 33.1% and females 27.3%). The age group that used the highest amount of medical cost per patient was the 60 to 69 years age group, followed by the 50 to 59 years age group and the 40 to 49 years age group.

Regarding the medical cost used by each age group, the 60 to 69 years age group (30.6% of the total patients) used 36.9% of the total hospitalization costs, followed by the 50 to 59 years age group (22.8% of the total patients) and the 40 - 49 years age group (18.7% of the total patients), which used 24.8% and 15.8%, respectively, of the total hospitalization costs. Of the total hospitalization costs used by the residents covered by national health insurance in City A, 19.4% was used for the patients with target mental disorders.

Analysis of the number of patients by each diagnosis of the 4 ICD 10 code names specified above is summarized in Table 3. The most frequent disorder was schizophrenia, followed by depressive episode and alcohol related disorders.

The hospitalization period was analyzed in patients with schizophrenia, a disorder which used highest hospitalization cost. As a result, 462 patients (61.2% of the patients with schizophrenia) were hospitalized for 91 days (3 months) or longer per year, and of them, 401 patients (53.1% of the patients with schizophrenia) were hospitalized for 180 days (6 months) or longer. The total

Table 3. Diagnosis of inpatients.

Disease name (ICD10)	No. of patients	Percentage of total inpatients
Schizophrenia (F20)	755	66.2%
Depressive episode (F32)	192	16.8%
Alcohol related disorders (F10)	124	10.9%
Bipolar disorder (F31)	70	6.1%
Some patients with multiple diseases		

hospitalization costs of the patients who were hospitalized for schizophrenia for 91 days or longer was approximately 1.72 billion yen, which accounted for 74.9% of the total hospitalization costs of the target mental disorders*.

*This cost is the total hospitalization costs of patients who were hospitalized for schizophrenia and includes the cost used for treatment of mental disorders other than schizophrenia and/or physical diseases.

3.4. Hospitalization Cost by Hospital Functional Classification

In Japan, each prefecture decides hospital functional classification of medical institutions matched by its medical/operational plans [20]. There are the following bed categories of hospital functional classification: 1) beds for the advanced acute phase = beds for highly intensive treatment for acute conditions, e.g., high-care unit and stroke care unit; 2) beds for the acute phase = beds for treatment of conditions that are in the acute phase but do not need highly intensive treatment; 3) beds for the convalescent phase = beds for rehabilitation or preparation for discharge after the acute phase; and 4) beds for the chronic phase = beds for long-term treatment. One medical institution may have more than one category of beds. In the present study, hospitalization was analyzed by hospital functional classification (Table 4). When a medical institution has more than one category of beds, it was grouped according to the highest category.

As a result, the percentage of the hospitalization cost for target disorders was the highest in psychiatric beds that do not belong in any of the above categories (59.1%), followed by the convalescent phase (24.2%) and the chronic phase (7.0%) categories. For these 3-bed categories that used most of the hospitalization cost as above, the hospitalization period per month was 26.2 days or longer, which was markedly longer than the hospitalization period for beds in other categories. Among the inpatients with the target disorders, 283 inpatients (19.6% of the total inpatients) were elderly (≥ 70 years), most of whom were hospitalized in one of these 3-bed categories. Of note, 8 patients whose deaths were recorded in the health insurance claim sheet were hospitalized in one of the above 3 bed categories having long hospitalization periods and had stayed in the hospital until their deaths.

For the medical cost per month, the cost was the high for the advanced acute phase and acute phase categories, for which highly intensive treatments are administered.

Table 4. Hospitalization by hospital functional classification.

Hospital functional classification	Percentage of total inpatients	Percentage of total hospital costs	Hospital days per month (Mean ± SD)
Medical institution for the advanced acute phase	11.2%	4.2%	9.3 ± 6.8
Medical institution for the acute phase	8.7%	3.8%	11.7 ± 9.0
Medical institution for the convalescent phase	22.8%	24.2%	28.5 ± 6.1
Medical institution for the chronic phase	8.7%	7.0%	26.2 ± 8.5
Psychiatric care institution that do not belong in any of the above categories	40.1%	59.1%	28.6 ± 5.9
Others	8.4%	1.7%	7.7 ± 3.4
Total	100.0%	100.0%	

3.5. Concurrent Disorders of Patients with Mental Disorders

The 30 medical conditions that are most frequently reported in the health insurance claim sheet of the patients with target mental disorders are summarized in Table 5. To specify the condition, we used the minor classification of ICD10 disorder name. Commonly observed conditions were insomnia, a condition often observed as a complication of mental disorders, and constipation, chronic gastroenteritis, diabetes/glucose tolerance abnormal, headache, deformation/ fracture of joint/spine, obesity, and drug-induced hepatic/renal disorders, which are conditions often observed as adverse reactions to antipsychotics.

Frequently reported disorders included lifestyle-related diseases such as hypertension, dyslipidemia, diabetes, hyperuricemia and obesity.

3.6. Diseases of Patients on Hemodialysis

Finally, Japan has the second highest density of patients requiring hemodialysis therapy in the world [21]. As renal failure is possible to manage, we analyzed patients requiring hemodialysis.

For the patients on hemodialysis among the residents covered by national health insurance in City A, risks of deterioration in renal function and complications were analyzed. Although temporal or causal relations between the hemodialysis and onset of the disease could not be analyzed in our study, we performed an analysis to identify the characteristics of this group (Table 6). Among these residents, 411 patients received hemodialysis, and common diseases observed among these patients were primary renal impairment, and secondary renal impairment associated with lifestyle diseases, such as hypertension, diabetes, and dyslipidemia. Patients with mental disorders frequently received hemodialysis as well.

4. Discussion

4.1. Long Hospitalization and Changes in Treatment Environments for Mental Disorders

We analyzed several aspects of targeted mental disorders. It was revealed that

Table 5. Top 30 disorders that the patients with target mental disorders have.

Rank	Disease name (Aggregated the minor classification of ICD 10 disease names)	No. of patients
1	Insomnia	2697
2	Constipation	1497
3	Neurodegenerative disease	1104
4	Chronic gastroenteritis	1069
5	Hypertension	1053
6	Dyslipidemia	926
7	Diabetes	725
8	Epilepsy	694
9	Infection	647
10	Cardiovascular disease	450
11	Headache	318
12	Orthopedic disease (Without fracture)	240
13	Cerebrovascular disorder	228
14	Hyperuricemia	224
15	Malignant neoplasm	164
16	Chronic hepatitis	142
17	Chronic heart failure	125
18	Hyperprolactinemia	113
19	Dementia	111
20	Benign prostatic hyperplasia	109
21	Fracture	100
22	Chronic kidney disease (Without diabetic nephropathy)	89
23	Alcoholic liver injury	80
24	Viral hepatitis	67
25	Obesity	64
25	Autoimmune disease	64
27	Dysuria (Without benign prostatic hyperplasia)	49
28	Impaired glucose tolerance	41
29	Drug-induced liver injury	23
30	Drug-induced nephropathy	6
	Some patients with multiple diseases	

patients in their 40 s accounted for the highest percentage of outpatients, while those in their 60 s accounted for the highest percentage of inpatients and were in the hospital for a long period. Also, it was revealed that many patients with mental disorders had complications with more than one mental or physical disorders and used medical cost for these comorbidities in addition to the underly-

Table 6. Top 20 diseases observed in patients on dialysis.

Rank	Disease name (Aggregated ICD 10 disease names)			
	60 years of age or younger (n = 148)	No. of patients	60 years of age or older (n = 263)	No. of patients
1	Hypertension	128	Hypertension	237
	Cardiovascular disease	94	Orthopedic disease (Without fracture)	186
	Orthopedic disease (Without fracture)	84	Cardiovascular disease	159
	Diabetes	72	Diabetes	158
	Hyperuricemia	45	Dyslipidemia	102
	Dyslipidemia	43	Chronic heart failure	98
	Chronic heart failure	42	Hyperuricemia	83
	Mental disorders	29	Cerebrovascular disorder	70
	Infection	27	Mental disorders	61
	Cerebrovascular disorder	20	Infection	36
	Chronic glomerulonephritis	18	Chronic glomerulonephritis	33
	(Renal cyst	15	Renal cyst	32
	Malignant neoplasm (Without renal malignant neoplasm)	10	Fracture	22
	Epilepsy	10	Epilepsy	19
	Autoimmune disease	10	Autoimmune disease	16
	Renal malignant neoplasm	6	Malignant neoplasm (Without renal malignant neoplasm)	8
	Fracture	6	Neurodegenerative disease	8
	Neurodegenerative disease	4	Amyloidosis	7
	Amyloidosis	2	Renal malignant neoplasm	7
20	Renal neoplasia	2	Dementia	6

ing mental problems. Moreover, quite a few of them received treatment for the highly acute phase.

These findings depict that some patients live with several mental and physical problems. From their 40s and onwards, patients tend to need hospitalization because they require inpatient management for their mental and physical disorders. Sometimes, they shift from outpatient visits to hospitalization as they have difficulty in visiting hospitals and receiving care after being discharged, leading to prolongation of hospitalization. In our analysis, follow-up of the outcome was limited because it was based only on health insurance claim data and we found few records of death. However, we estimate that actual data will show that more end-of-life care has been administered in hospitals.

According to a report that describes the medical and societal costs for Japanese patients (age ≥ 20 years) with depression or schizophrenia, treatment cost of mental disorders accounts for 9% to 28% of the total costs, while societal cost associated with absenteeism (absent from work) or presenteeism (lowered productivity) accounts for 47% to 67% and mortality cost accounts for 45% to

47% [9] [12]. Regarding societal cost, discussions are also taking place in abroad [22] [23]. The survey by the Ministry of Health, Labour and Welfare (2014) reported that among patients who are hospitalized for an extended period, those who need urgent support for their daily or social life in addition to disease management and care often lacks access to these supports [24]. On the other hand, the patients who need relatively less support have to spend a long time in training for jobs and self-management and can obtain few medical services in the community such as home-visiting nursing care, visiting medical care, day care, or care for their physical conditions. Such lacks of medical management and care services are leading to longer hospitalizations.

In Japan, the government has changed its policy for treatment of mental disorders from 2004 [25]. The policy encourages utilization of mental health services in the community instead of hospitalization. In order to carry out these changes, beds are being reduced, the treatment, care, and welfare services in the community are being enhanced, and personnel who provide these services are being trained. Although it will depend on each patient's mental and physical condition, it is desirable to organize social services and provide treatment and training for jobs and self-management from the early phase of the disease in order to support the patient's life in the community. Recently, the number of patients with dementia is also increasing in addition to the target mental disorders analyzed in the present study, and education is necessary for the general public to deepen understanding of mental disorders. From the high percentage of mortality cost disclosed in a previous study, it can be estimated that end-of-life care in hospitals is not few [9] [12]. It is reported that advanced care planning is not widely used in Japan [26]. In order to improve the QOL of patients, medical professionals have to provide the patients and their family with information on the outlook of the disease and how to care for the patients at the end of life. These suggestions will enable patients & their family in decision making with the preferences, medical indications, and living conditions of the patients/family considered.

4.2. Comprehensive Assessment of the Mental/Physical Health of Patients with Mental Disorders

Our study revealed that many patients with mental disorders have physical problems as well. Although temporal/causal relation between diseases was not clarified in our analysis, interaction between mental and physical conditions hinders proper control of the systemic condition and leads to lowered QOL and risks of death. The diseases commonly observed in the patients included in our analysis were symptoms associated with the underlying mental disorders, common adverse reactions to antipsychotics, and lifestyle-related diseases. Since we have universal coverage and a free access healthcare system in Japan, not all patients with mental disorders are followed up by specialists. It is important for medical professionals to comprehensively assess the mental/physical and living conditions of the patients as well as the available social resources to help them

have access to better self-management education and medical care services. Patients with mental disorders often use several drugs. Medical professionals should recommend them to consult specialists when they show symptoms associated with their mental disorders or common adverse reactions to antipsychotics so that they can switch to a more appropriate treatment, dose, or non-pharmaceutical therapy.

Furthermore, Japan has the highest aging rate in the world (WHO, 2010), and the aging rate in 2015 is 26.7% (Ministry of Health, Labor and Welfare, 2015) [27] [28]. The elderly population rate is expected to rise in the future, and accordingly, an increase in the number of elderly patients with dementia is estimated [28]. It is reported that patients with dementia have high prevalence of physical diseases [29] [30], and the home treatment becomes more difficult as the severity of the physical diseases increases [31] [32] [33]. In order to realize the dementia patient's familiar living place and to improve patient's QOL, it is necessary to analyze the cost for mental disorders further and to improve service and infrastructure in the future.

In this study, there is a limit to generalization because the subject is covered by national health insurance in one area. However, the results of clarifying the health resource utilization and comorbidities in patients with mental disorders can be implemented to improve the health services and systems. It is necessary to expand the number of areas and sample size for further analysis.

5. Conclusion

Our study revealed that patients with mental disorders are shifting from outpatient treatment to hospitalization as they get older. Patients in general are often hospitalized for an extended period, and they have many concurrent mental/physical problems. Therefore, comprehensive assessment of their mental/physical health, self-management education suitable for each patient, organization of services, and support for decision making regarding treatment are essential for the improvement of their QOL.

Acknowledgements

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