An Investigation of Spectrum of Diseases and Medication Use in Discharged Patients with Mental Disorders in the Inner Mongolia Autonomous Region

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Abstract

Objective We aim to investigate the inpatient status of patients with mental disorders who had been discharged from psychiatric hospitals in 2016 in the Inner Mongolia Autonomous Region, and through this, to provide theoretical basis for further improving the security system for patients with mental disorders in this region.

Method: A two-phased stratified sampling method was used to collect data from selected hospitals.

Results: A total of 1646 cases with valid data were obtained. The most common mental diseases were schizophrenia and bipolar disorder; atypical antipsychotic drugs played a dominant role (95.78%) among various antipsychotics, with risperidone being the most frequently used drug.

Conclusion: We need to further improve the management of schizophrenia and bipolar disorder, as well as the hospital-community integration mode. Standardized training of residents and further education for clinicians should be enhanced to improve doctors' clinical skills and promote drug prescribing in a scientific, rational and standardized manner.

Introduction

With the development of smart technologies and the coming of information era, people are encountering new things every day, and are experiencing more competition in work. Living in a society full of various challenges, mental health issues have become a prominent concern. At present, around 450 million people are affected by mental health disorders globally, and one in every four people is experiencing various levels of mental health issues, which has brought huge financial burdens on their families and the whole society^[1]. As of the end of 2017, the documented number of patients with severe mental disorders had reached 5.81 million in China, with 107,847 documented in the Inner Mongolia Autonomous Region. Located in northern China, and with a vast area and a large ethnic minority population, the development of mental health services in the Inner Mongolia Autonomous Region is behind that in more developed southern areas. Because of a certain peculiarity in its geographical location and demographic structure, the epidemiology and spectrum of disease might be different from those of other regions. Thus, studies on mental disorders in the Inner Mongolia Autonomous Region are still at an exploratory stage. In this study, we have analyzed the spectrum of diseases and medication use in 6 psychiatric hospitals in the Inner Mongolia Autonomous Region, in order to provide reference for diagnoses and treatments given by mental health service providers and to provide theoretical basis for further improvement of the health care system for patients with mental disorders in this area.

1. Study Subjects And Methods

1.1 Study subjects

Patients with mental disorders discharged from psychiatric hospitals in the Inner Mongolia Autonomous Region in March, July and November of 2016 were screened. With exclusion of patients with discharge diagnoses inconsistent with ICD-10 criteria, a total of 1646 patients with valid data were included in this study.

1.2 Methods

1.2.1 Sampling method

Before investigating the condition of patients with mental disorders who were discharged in 2016, we have counted mental health organizations in the Inner Mongolia Autonomous Region. As of the end of 2016, there were a total of 18 psychiatric hospitals in this region, which included 3 Level A tertiary hospitals, 6 Level B tertiary hospitals, 4 Level A secondary hospitals, 3 Level B secondary hospitals and 2 unevaluated hospitals. In 2016, there were around 17,000 hospitalizations of patients with mental disorders during the year in this region. Sample data were obtained using a two-phased sampling method.

Phase I: stratified random sampling. A total of 6 hospitals were randomly selected by grade and level in a proportion of 1/3, with 1 from Level A tertiary hospitals, 2 from Level B tertiary hospitals, 1 from Level A secondary hospitals, 1 from Level B secondary hospitals and 1 from unevaluated hospitals.

Phase II: systematic random sampling. With month as the basic unit, patient data of 3 months, i.e., March, July and November, were systematically selected from the 6 hospitals.

Data from a total of 1646 cases, which met the ICD-10 diagnostic criteria, were obtained through the two-phased sampling method.

1.2.2 Tools for investigation

The tool used for this study is a self-designed investigation record form, which was pre-tested in our hospital (Mental Health Center of Inner Mongolia Autonomous Region) and revised repeatedly according to expert advice on relevant issues. The content of this investigation record form included sex, age, ethnicity, marital status, education level, occupation, hospital stay, discharge diagnoses and type and dosage of medications of patients with mental disorders.

1.2.3 Statistical analysis

An EXCEL database was built for the data obtained. Using appropriate statistical methods based on characteristics of the data, the data were analyzed with the use of SPSS22.0 software. Descriptive statistical analyses were performed for general data; measurement data were represented using mean $\pm$ SD (standard deviation) and enumeration data were represented with rates.

2. Results

2.1 Distribution of types of mental disorders that affect patients

A total of 1646 patients with mental diseases were investigated in this study, among which patients with schizophrenia accounted for the highest proportion (40.40%, 665 cases), followed by patients with bipolar disorder (10.51%, 173 cases) and those with major depressive disorder (7.65%, 126 cases). The diseases ranked 4th and 5th were mental and behavioral disorders due to use of alcohol (7.59%, 125 cases) and other mental disorders due to known physiological condition (5.65%, 93 cases). Of all the patients, 1537 (93.38%) were discharged with clinical remission. The proportion of mental disorders distributed in the spectrum is presented in Fig. 1, which highlighted the percentages of the first 10 diseases.

Table 1
Distribution of diseases of patients discharged

Name of Disease (ICD-10)	Number of cases (n)	Percentage (%)	Rank
Schizophrenia (F20)	665	40.40	1
Bipolar disorder (F31)	173	10.51	2
Major depressive disorder (F32)	126	7.65	3
Mental and behavioral disorders due to use of alcohol (F10)	125	7.59	4
Other mental disorders due to known physiological condition (F06)	93	5.65	5
Dissociative and conversion disorders (F44)	90	5.47	6
Major depressive disorder, recurrent (F33)	76	4.62	7
Mental disorder, not otherwise specified (F99)	56	3.40	8
Unspecified intellectual disabilities (F79)	34	2.07	9
Manic episode (F30)	33	2.00	10
Other mental disorders	175	10.63	—
Total	1646	100.00	—

2.3 Medication Use Of Patients Of Mental Disorders

2.3.1 Medication use

Generally, commonly prescribed psychiatric medications fall into four categories, including antipsychotics, antidepressants, anxiolytics and mood stabilizers. As anxiolytics mainly included benzodiazepines, which is a common type of adjuvant drugs, we have categorized benzodiazepines, benhexol hydrochloride and other medications into adjuvant drugs for the statistical analyses. 754 patients (45.81%) were treated with a single drug and 892 (54.19%) were treated using combination drug therapy. See Table 3.

Table 3
Medication use of patients with mental disorders

Medication Use	Number of Cases (n)	Percentage (%)
Monotherapy	754	45.81
Antipsychotic drug	521	31.65
Antidepressant	157	9.54
Anxiolytic drug	30	1.82
Mood stabilizer	25	1.52
Other adjuvant drugs	21	1.28
Combination drug therapy	892	54.19
Total	1646	100.00

2.3.2 Frequency Of Drug Use And Dosage

The top five most commonly prescribed antipsychotics were risperidone, olanzapine, quetiapine fumarate, clozapine and aripiprazole and the top five most commonly used antidepressants were escitalopram oxalate, paroxetine hydrochloride, venlafaxine hydrochloride, duloxetine hydrochloride and mirtazapine. Commonly used mood stabilizers included magnesium valproate, sodium valproate and lithium carbonate. The frequency of use of psychiatric medications and their mean daily doses are shown in Table 4 and Table 5.

Table 4
Frequency of use of antipsychotics and their mean daily doses

Rank	Medication	Number of Cases (n)	Usage Rate (%)	Range of Dose (mg)	Mean Dose (mg)
1	Risperidone	490	29.77	1–8	3.54 ± 1.28
2	Olanzapine	480	29.16	2.5–30	12.79 ± 6.26
3	Quetiapine fumarate	270	16.40	25–800	299.35 ± 181.58
4	Clozapine	221	13.43	25–400	151.02 ± 100.61
5	Aripiprazole	143	8.69	2.5–30	14.56 ± 6.52
6	Sulpiride	44	2.67	50–1200	273.86 ± 227.34
7	Ziprasidone	31	1.88	20–160	107.74 ± 45.22

Table 5
Frequency of use of antidepressants and their mean daily doses

Rank	Medication	Number of cases (n)	Usage Rate (%)	Range of Dose (mg)	Mean Dose (mg)
1	Escitalopram oxalate	198	12.03	5–25	14.60 ± 4.91
2	Paroxetine hydrochloride	114	6.93	20–70	33.82 ± 11.98
3	Venlafaxine hydrochloride	52	3.16	75–300	196.15 ± 47.33
4	Duloxetine hydrochloride	49	2.98	20–120	83.27 ± 23.66
5	Mirtazapine	30	1.82	7.5–45	23.25 ± 8.89
6	Sertraline hydrochloride	22	1.34	25–150	81.82 ± 40.22
7	Trazodone hydrochloride	12	0.73	25–150	77.08 ± 37.63

3. Discussion

The findings of this study show that the most common mental diseases were schizophrenia and bipolar disorder for patients hospitalized in psychiatric hospitals in the Inner Mongolia Autonomous Region, which is consistent with the result of a study conducted by Zong et al.^[2] in a psychiatric hospital in Hubei province. Of note, mental and behavioral disorders due to use of alcohol ranked 4th in this region, which was significantly higher than that in other regions^[3]. Through analysis, this might be associated with the

unique geographical location and population structure. The Inner Mongolia Autonomous Region is an area where ethnic minorities live in compacted communities, with the main population of ethnic minorities being Chinese Mongols, whose ethnic characters include boldness, unconstraint and passion. The Mongols are fond of liquor and has their unique drinking culture^[4]. Thus, the interaction between their cultural tradition and life style might be the reason for higher prevalence of mental and behavior disorders due to use of alcohol. The proportions of patients with neuroses, stress-related disorders and somatoform disorders were relatively lower and not listed in top 10, the reason for which might be patients' lack of knowledge on mental disorders and their stigma^[5]. Some patient could not correctly understand their illnesses and were unwilling to seek medical attention in psychiatric hospitals, and some preferred outpatient treatment based on their conditions. There are still some patients being recommended to visit psychiatric hospitals because their physical conditions have been excluded after their repeated visits to various general hospitals. Therefore, not only psychiatric hospitals, general hospitals also need to promote public education on mental health, regard mental health knowledge as content of lifelong learning and pay attention to mental health issues in non-psychiatric departments^[6].

With regard to psychotropic medication use, there were 754 patients (45.81%) treated with a single psychotropic drug and 892 patients (54.19%) treated with combination therapy in 2016 in this region, with cases treated with combination therapy accounting for a higher proportion. Although monotherapy has been emphasized in treatments for mental disorders, combination therapy was still commonly used, especially for patients with treatment-resistant schizophrenia, due to the peculiarity of mental diseases. Some of the medications in the combination therapy were intended for improving sleep quality, e.g., olanzapine, and some were used to stabilize patients' mood, e.g., sodium valproate and magnesium valproate, but there were occasions that these drugs were used in a non-standard way. In most cases, the combination of antipsychotics is intended for enhancing therapeutic effect or reducing adverse reactions, to avoid high doses of a single drug. Although this may lead to desirable effect to some extent, we need to be aware that combination of drugs may increase the risk for adverse reactions, and further add to patients' financial burden. Therefore, clinicians should prescribe medications in a standardized manner and try to follow the principle of single drug treatment. If a patient's condition requires combination drug therapy, advantages and disadvantages of the regimen should be weighed thoroughly. Clinicians should also fully understand the incompatibility and interaction of drugs when applying combination therapy on patients, in order to maximize the therapeutic effect and minimize potential risks of adverse reactions.

It has been 60 years since the first application of chlorpromazine; during this period, many new types of psychotropic drug were used in clinical practice. As clinicians are gaining understanding in mental disorders and accumulating experience in the treatment, the situation of patients with mental disorders has improved greatly, and new drug are being developed and promoted. According to the present study, the use of atypical antipsychotics was dominant (95.78%), which is in line with the result of the studies conducted by Liu and Julaeha^[7-8]. Compared to typical antipsychotics, atypical antipsychotics are associated with a higher response rate, lower rate of treatment discontinuation, higher subjective comfort level of patients with mental disorders^[9], lower risks for metabolic syndrome and cardiovascular

diseases^[10], and definite therapeutic effect. According to an investigation of Ma et al.,^[11] gradually replacing typical antipsychotics with atypical antipsychotics in the treatment of chronic schizophrenia not only had significant effect on positive symptoms, negative symptoms and psychopathy, but also guaranteed patient safety. However, the cost of atypical antipsychotics might be much higher than typical antipsychotics, which might be a financial challenge for patients. This investigation has shown that only a very small percentage of patients were treated with typical antipsychotics such as sulpiride and perphenazine, which is considered to be related to the patients' condition and economic status. New types of antipsychotics have been widely used in clinical treatment of mental disorders, meaning that the use of antipsychotics in this region no longer remains at the initial stage, but has reached an international level, along with improved treatment methods and healthcare services.

Antidepressants were widely studied in the middle of the 20th century. Classic antidepressants include monoamine oxidase inhibitor (MAOI) and tricyclic antidepressant (TCA); however, TCA has an anticholinergic effect and relatively greater cardiotoxicity, which limited its application, especially in elderly patients^[12], and led to its replacement with new drugs. Meanwhile, new types of antidepressants, such as selective serotonin reuptake inhibitors (SSRIs, e.g., fluoxetine, paroxetine, sertraline, fluvoxamine and citalopram) and serotonin-norepinephrine reuptake inhibitors (SNRIs, e.g., venlafaxine and duloxetine), have been favored by clinicians because they may lead to only mild or no adverse reactions. The most commonly used antidepressants in this region were all new types of antidepressants and did not include any TCA, indicating that safety of medication use was ensured in this area, which was in accordance with the principle for clinical use of medications.

4. Conclusions

In conclusion, the most common mental disorders in the Inner Mongolia Autonomous Region were schizophrenia and bipolar disorder, which are also most common mental diseases in China, and are associated with a long treatment cycle and high recurrence and disability rates. Although patients with these disorders need whole-course, long-term and safe management, which is likely to include combination therapy, the high costs incurred will bring enormous burden to individuals, their families as well as the society^[13–14]. Although new psychotropic drugs have shown satisfactory efficacy, the high expenses they incur may add to patients' financial burden at the same time. Effective financial input in health care is an important guarantee for balanced allocation of mental health resources^[15]. In recent years, China has been implementing the medical insurance system and improving its medical care level. As any adjustment in medical insurance policy may greatly influence treatment plans, prescription preferences and medication use, we have been actively promoted the introduction and implementation of mental health regulations. Governments at all levels and financial departments are also called for to make rational financial budget plan for mental health services, increase investment in prevention and treatment of mental disorders, promote hospital-community integration mode and optimize community management. Furthermore, standardized training of residents and further education for clinicians should also be enhanced to improve doctors' clinical skills; psychiatric hospitals should standardize their clinical

medication use and follow the principle of single drug treatment whenever possible to reduce the risk of recurrence of mental disorders and improve patients' adherence to treatment. Governments also need to take measure to reduce the risks of illness-caused poverty and poverty-caused illnesses, help more patients integrate into the society and improve their quality of life, and further develop mental health services in this region effectively.

Abbreviations

MAOI:monoamine oxidase inhibitor;SNRIs:serotonin-norepinephrine reuptake inhibitors;

SSRIs:selective serotonin reuptake inhibitors;TCA:tricyclic antidepressant

Declarations

Ethics approval and consent to participate

This study was approved by the Medical Ethics Committee at Mental Health Center of Inner Mongolia Autonomous Region,Inner Mongolia Autonomous Region,China. There was no need of informed consent because the study only involved retrospective reviews of the electronic medical records of patients, and patients' identity was protected.

Consent for publication

Not applicable.

Availability of data and materials

By contact with the corresponding author Lixia Chen.

Competing interests

XC, LC, LZ, JM , YL , QW and LL declare no competing interests.

Authors' contributions

All authors were responsible for the structure of this paper. XC and LL obtained the data. XC conducted literature search and data analysis. XC and LC drafted the paper. XC, LC, LZ, JM, YL, QW and LL all contributed to the conception and design, interpretation of the data, and critical revisions of the paper, and approved the final versions for submission.

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References

1. . Dalfardi B, Yarmohammadi H. Ghanizadeh A. Melancholia in medieval Persian literature: The view of Hedayat of Al-Akhawayni[J]. World Journal of Psychiatry. 2014;4(02):37–41.
2. .Zong D, Zhong Y, Jin L, et al. Epidemiological Characteristics of Psychiatric Inpatients in a Three A and Tertiary Hospital in Hubei Province from 2014 to 2018[J]. Chinese Medical Record. 2019;20(05):42–5.
3. .Yang WH, Zhang S, Luo C, et al. Clinic Epidemiological Characteristics of the Inpatients with Substance Abuse in Wuhan from 2013–2015[J]. Chinese Journal of Social Medicine. 2017;34(04):347–9.
4. .Li S. *Menggu Mishi (The Secret History of the Mongols)* and the Drinking Culture of the Mongols[J]. Journal of Chifeng University (Philosophy Social Science Chinese Edition). 2014;35(06):14–6.
5. .Liang D, Mays VM, Hwang WC. Integrated Mental Health Services in China: Challenges and Planning for the Future[J]. Health Policy Plann. 2018;33(1):107–22.
6. .Hu DY. Implementation of “Double Heart Medicine” Service Model - Attaching Great Importance to Mental and Psychological Problems in Doctor Education and Science Communication. Chinese General Practice. 2019;22(18):2150–1.
7. .Liu Y, Chen JL. Daily Prescription Analysis of Psychotropic Drugs of 204 Inpatients. Chinese Journal of Pharmacovigilance. 2017;14(01):45–8.
8. .Julaeha J, Athiyah U, Hermansyah A. The Prescription Patterns of Second-generation Antipsychotics in Schizophrenia Outpatient Setting[J]. J Basic Clin Physiol Pharmacol. 2019;30(6):20190289.
9. .Fan LZ. Analysis of Combination of Multiple Antipsychotic Drugs in Level A Tertiary Psychiatric Hospitals in a City[J]. Heilongjiang Medical Journal. 2020;44(02):249–51.
10. .Zhang Y, Li G, Wang RM. Efficacy and Safety of Combination of Antipsychotic Drugs. Chinese Journal of Urban Rural Enterprise Hygiene. 2018;33(12):48–51.
11. .Ma XL, Sun HJ. Efficacy and Safety of Risperidone in Place of Typical Antipsychotics in the Treatment of Negative Symptoms of Chronic Schizophrenia. Journal of China Prescription Drug. 2020;18(03):113–5.
12. .Diaz D, Vallejos Á, Torres S, et al. Detection of Potential Risks in the Prescription of Tricyclic Antidepressants through an Online Clinical Alert System[J]. Revista Colombiana de Psiquiatria, 2020, 49(1): 9–14.

13. .Souza ALR, Guimarães RA, de Araújo Vilela D,et al. Factors Associated with the Burden of Family Caregivers of Patients with Mental Disorders: a Cross-sectional Study[J]. BMC Psychiatry. 2017;17(1):353.
14. .India State-Level Disease Burden Initiative Mental Disorders Collaborators. The Burden of Mental Disorders across the States of India: the Global Burden of Disease Study 1990–2017[J]. The Lancet Psychiatry. 2020;7(2):148–61.
15. . Gao LH. Investigation of Mental Health Resources in the Inner Mongolia Autonomous Region in 2017[D]. Jilin University, 2019.

Figures

Figure 1

The spectrum of mental diseases