National Journal of Physiology, Pharmacy and Pharmacology

RESEARCH ARTICLE

Assessment of drug prescribing pattern in schizophrenia in a tertiary care hospital in South India

Shweta Oommen[1], Elango P[2], Alwar M C[1], Susan Solomon[3]

[1]Department of Pharmacology, Pondicherry Institute of Medical Sciences, Pondicherry, India, [2]Department of Pharmacology, Sri Ramachandra Medical College, Chennai, Tamil Nadu, India, [3]Department of Psychiatry, Pondicherry Institute of Medical Sciences, Pondicherry, India

Correspondence to: Elango P, E-mail: shweta.oommen@gmail.com

Received: April 16, 2019; **Accepted:** May 03, 2019

ABSTRACT

Background: Irrational use of medicines is a global problem and the World Health Organization (WHO) states various factors that are necessary to curb irrationality of prescriptions. The WHO emphasizes on various steps such as prescribing medications according to the patient clinical need, right dose with adequate period of time, and lowest cost to them and their community. **Aims and Objectives:** The objective was to assess the rationality of atypical antipsychotics prescribed in the psychiatry outpatient department in a tertiary care hospital in India. **Materials and Methods:** The study was a cross-sectional descriptive study. 136 prescriptions of schizophrenia patients were collected and checked for rationality using the prescribing indicators formulated by the WHO. **Results:** The average number of drugs per encounter was 2.28. The drugs prescribed by generic name and from an essential drug list (EDL) were 79.4% and 45.5%, respectively. Percentage of encounters with injection was 21.8%. **Conclusion:** Overall, the prescriptions adhered to the indicators defined by the WHO but slight variations were seen in the average number of drugs prescribed and the drugs from an EDL. This may be due to various reasons such as side effect of drugs, socioeconomic reasons, and other technical difficulties.

KEY WORDS: Irrational Drug Use; World Health Organization Prescribing Indicators; Prescriptions; Atypical Antipsychotics

INTRODUCTION

World Health Organization (WHO) stated that "The irrational use of medicines is a major problem worldwide" on its "rational medicine use" webpage.[1] According to the WHO, rational use of medicines requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at lowest cost to them and their community.[2] Disappointingly, prescribing patterns do not always conform to these criteria and can be classified as "pathological prescribing." The WHO states that majority of the drugs are prescribed, dispensed, or sold inappropriately and that half of all patients fails to take them correctly. Therefore, in a country like India, which is still developing, the use of pharmaceuticals has been observed to be inexpedient, unsuccessful, and economically worthless.

Schizophrenia is a disorder that is chronic and is seen to appear in 0.5% of the population in their late teens or early adulthood. People with schizophrenia see, hear, and think differently and are often at a significant loss of contact with reality. Hence, it is a global concern.[3] Treatment options are varied, but the main treatment for schizophrenia includes antipsychotic drugs. Drugs used in schizophrenia are mainly the typical and atypical antipsychotic drugs. Patients with schizophrenia need long-term treatment and the cost factor becomes an economic burden. Apart from the cost

Access this article online	
Website: www.njppp.com	Quick Response code
DOI:10.5455/njppp.2019.9.0516503052019	

of the antipsychotics, there are other factors that add to the economic burden such as the side effects associated with the anti-psychotic medications. There are various studies that states that more than half of the drugs are prescribed without reason, in higher doses and in fixed combinations which are irrational. Irrational drug use is likely to reduce the drug effect, waste resources, increased cost, and lead to unnecessary drug interaction and increased drug resistance.[4] The introduction of the core drug use indicators (CDUIs), by the WHO, has been regarded as a critical achievement in promoting the rational use of drugs. Such standardized indicators also provide a simplified tool for effectively assessing the critical aspects of drug use in primary health setting. CDUIs have been categorized into three main types: Prescribing indicators, patient care indicators, and facility indicators.[5]

Promoting safe and prudent use of drugs in schizophrenia are essential since the disease itself comes with a package of long-term treatment and side effects associated with it.[6] Regular auditing of prescriptions by trained professionals will help in promoting better and safe future for these patients in terms of rational medical care which is also cost effective.[7] There is few data on the southern population that identifies the prescription errors with atypical antipsychotics, especially with a chronic disease as schizophrenia. This led the authors to assess the drug prescription pattern in schizophrenia using the WHO prescribing indicators.

MATERIALS AND METHODS

The study design was cross-sectional and descriptive, conducted from October 2016 to January 2017. The Institutional Ethics Committee clearance was obtained for the study. 136 prescriptions of schizophrenia patients were collected from the outpatient department (OPD) of psychiatry. Inclusion criteria included patients above 18 years of age diagnosed with schizophrenia according to DSM-5 criteria. Patients with any other psychiatric illness were excluded from the study. The demographic details of the patients, prescription indicators on the prescription, and drug combinations prescribed were collected. The prescriptions were checked for rationality using the prescribing indicators formulated by the WHO. The indicators are as follows:[4]

1. Average number of drugs prescribed per encounter was calculated by dividing total number of drug products prescribed by number of encounters surveyed.
2. Percentage of drugs prescribed by generic name was calculated by dividing number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100.
3. Percentage of encounters with an antibiotic prescribed was calculated by dividing number of patient encounters in which an antibiotic was prescribed by total number of encounters surveyed, multiplied by 100.
4. Percentage of encounters with an injection prescribed was calculated by dividing number of patient encounters in which an injection was prescribed by total number of encounters surveyed, multiplied by 100.
5. Percentage of drugs prescribed from an essential drug list (EDL) was calculated by dividing number of products prescribed from EDL by total number of drugs prescribed, multiplied by 100.

RESULTS

In 3 months, a total of 136 prescriptions were collected from the OPD of psychiatry. Among 136 prescriptions analyzed for demographic details, 78 were female patients (57.35%) and maximum number of schizophrenics was seen in the age group between 31 and 40 years (45.6%) followed by 21–30 years (36.8%). Duration of illness (81%) was >5 years for majority of patients [Table 1].

Considerable number of prescriptions was for clonazepam (70, 20.3%), sertraline (65, 19.0), and olanzapine (45, 13.04). Parenterals such as fluphenazine decanoate and haloperidol amounted for 42% and 33% of the prescriptions, respectively [Table 2].

Table 1: Characteristics of study participants (*n*=136)

Characteristics	*n* (%)
Gender	
Male	58 (42.64)
Female	78 (57.35)
Age group	
<20	3 (2.2)
21–30	50 (36.8)
31–40	62 (45.6)
41–50	21 (15.4)
Duration of illness	
<5 years	110 (81)
>5 years	26 (12)

Table 2: Drugs prescribed

Drugs	*n* (%)
Olanzapine	45 (12.16)
Risperidone	28 (7.56)
Amisulpride	17 (4.59)
Aripiprazole	20 (5.40)
Quetiapine	18 (4.86)
Clozapine	8 (2.16)
Clonazepam	70 (18.91)
Sertraline	65 (17.56)
Haloperidol	33 (8.91)
Fluphenazine decanoate	42 (11.35)
Trihexyphenidyl	24 (6.48)

Most of the prescriptions had complete prescription (112, 82.3%). The average number of drugs per encounter and drugs prescribed by generic name was found to be 2.28 and 79.4%, respectively. The analysis of other prescription indicators is depicted in Figure 1.

The drug combinations were maximum seen with atypical antipsychotics with anticholinergic drugs (52, 69.16%), atypical antipsychotics alone (40, 54.4%), atypical antipsychotics with typical antipsychotics (28, 38.08%), and atypical antipsychotics with antidepressants (16, 21.76%) [Figure 2].

Rationality of prescriptions was analyzed using the WHO core prescribing indicators and the values are presented in Table 3.

DISCUSSION

The results of the WHO core drug prescribing indicators were analyzed and the average number of drugs per encounter was 2.28. Drugs prescribed by generic name were 79.4% and the percentage of encounters with injection was 21.8%. Drugs prescribed from an EDL were found to be 45.5%.

In this study, most of the prescriptions were for female patients with schizophrenia (78, 57.35%). However, there is only a marginal difference in comparison with the male patients having schizophrenia which is in accordance to the study conducted by Thara and Kamath.[8] Most of the patients belonged to the age group of 31–40 years and 110 patients had the illness for more than 5 years. Similar findings were seen in the study done by Buoli *et al*. and they found out that duration of schizophrenia was around 15 years for non-responders and around 8.7 years for responders.[9] This may be due to the fact that schizophrenia is a chronic disease[10] and the need for long-term treatment is crucial for the management of the disease. Drugs prescribed in schizophrenia are mainly the antipsychotics and it is considered as the mainstay for the treatment. In this study, the antipsychotic that has been prescribed the most is olanzapine (45, 13.04%). According to the results of the clinical antipsychotic trials for intervention effectiveness (CATIE) schizophrenia trial, olanzapine and risperidone showed greater effectiveness compared to the

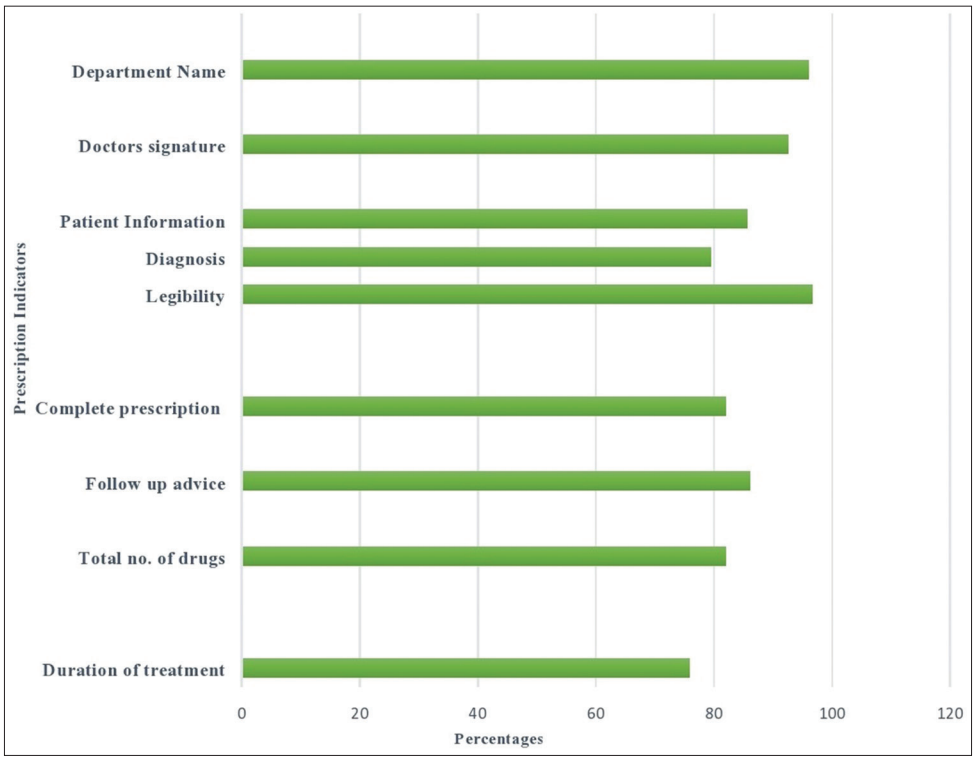

Figure 1: Analysis of prescription by WHO indicators

Table 3: The WHO core prescribing indicators

Indicators	Total no. of drugs/encounters	Total no. of average/percentage
Average no. of drugs prescribed	345	2.28
Parenteral drugs prescribed	75	21.8
Generic drugs prescribed	108	79.4
Essential drugs prescribed	62	45.5

WHO: World Health Organization

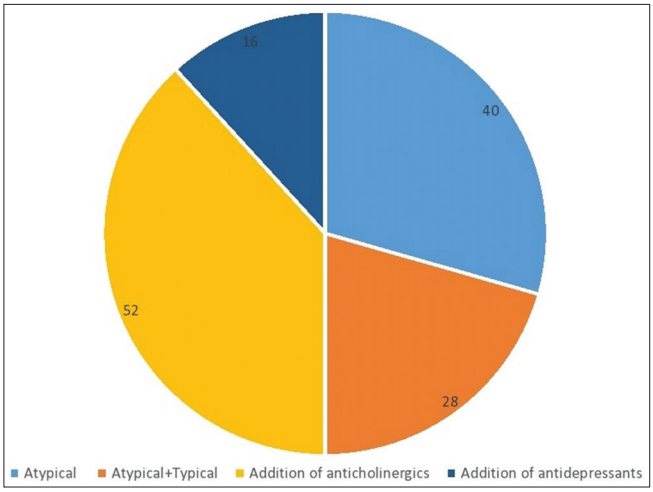

Figure 1: Drugs combination prescribed

other second-generation antipsychotics. In our psychiatry OPD, most of the prescriptions also contained risperidone (28, 8.11%) apart from olanzapine which is in accordance to the study done by Manschreck and Boshes.[11] The drug clonazepam (70, 20.3%) was seen to be the maximum prescribed drug in the prescriptions of schizophrenia patients. Clonazepam which belongs to the benzodiazepine group is known to have certain advantages in the treatment of schizophrenia. Herrera *et al*. points out in their study that clonazepam as an adjuvant drug with antipsychotics helps with the positive symptoms.[12] Clonazepam also calms the agitated patients and helps in improving their sleep pattern.[13] These properties of clonazepam qualifies this drug as an adjuvant in the treatment of schizophrenia. Prescription of sertraline (65, 19%) in our psychiatry OPD was second highest to clonazepam. Sertraline is a selective serotonin reuptake inhibitor (SSRI) and has additional properties other than its antidepressant effect. In an open trial done by Thakore *et al*. in 1996, the addition of sertraline resulted in the decrease of positive and negative scores and the authors also observed a global improvement in those patients.[14] Thus, sertraline makes the cut as an adjuvant drug in schizophrenia. Most of the prescriptions had documented patient's information (85.6%), department name (96%), and doctor's signature (92.5%). Drug combinations were studied from prescriptions and it was found out that antidepressants and anticholinergic drugs were routinely combined with atypical antipsychotics. Trihexyphenidyl is one of the anticholinergics that are combined with the atypical antipsychotics as depicted in Figure 2. In our study, trihexyphenidyl is combined with risperidone to overcome the extrapyramidal side effects such as tremors and drug induced parkinsonism. It is also combined with clozapine in patients with hypersalivation. Ogino *et al*. discussed the benefits and limitations of the use of anticholinergics in schizophrenia. Anticholinergic drugs are used to treat extrapyramidal side effects caused by antipsychotics in the treatment of schizophrenia. However, anticholinergic drugs have an effect on peripheral as well as central system. Dry mouth and constipation are its peripheral side effect and central adverse effects are cognitive deterioration and exacerbation of tardive dyskinesia.[15] Antidepressants such as SSRI's and benzodiazepines were prescribed in combination with atypical antipsychotics and it accounted for 29% of the various combinations. As discussed earlier based on few studies, these drugs have additional properties such as improvement in positive and negative score as well as muscle relaxing effects in agitated patients.[13,14] Typical antispychotics (21%) such as haloperidol and fluphenazine decanoate injections have been combined with atypical antipsychotics in our study. Comparison of three cohorts showed that long acting antipsychotic injections helped in improving the medication adherence of patients with schizophrenia.[16] This is probably one of the rationale in using long acting injections such as haloperidol and fluphenazine even in our psychiatry OPD. The WHO has developed standard indicator values to analyze the prescribing indicators from prescriptions.[17] On analyzing the WHO core prescribing indicators, the average number of drugs prescribed is 2.28 which is higher than the recommended standard of 1.6–1.8. The parenteral prescribed is 21.8% which is in accordance to the derived standard of 13.4–24.1%. The drugs prescribed by generic name and from essential dug list are 79.4% and 45.5%, respectively, which is lower than the recommended ideal standard of 100%. The EDL used in this study was the National List of Essential Medicines (2016). In this list, drugs such as olanzapine and sertraline which were prescribed in our study are not included. This is probably the reason for the dip in percentage of drugs prescribed from EDL.

There were few limitations in the study. Firstly, the study was done in a single center with a small sample size of 132 prescriptions. The prescriptions would have definitely varied if inpatient data were also collected. Future studies can be carried out using patient care and facility care indicators for a complete drug utilization study. However, future studies can be built on using the results of this study.

CONCLUSION

The prescription pattern was studied for schizophrenia patients and the antipsychotic drug that was prescribed the maximum was olanzapine followed by risperidone which is in accordance to the results of CATIE trial. The use of clonazepam and sertraline as adjuvant drugs with antipsychotics was seen in the study. Similar pattern was observed in various studies and was also recommended in Maudsley's guidelines. Overall, the prescriptions adhered to the indicators defined by the WHO but slight variations were seen in the average number of drugs prescribed which was higher than the recommended level. This may be due to the side effects caused by the antipsychotics and the need for additional drugs to overcome these undesired effects. The drugs prescribed from an EDL were lower than the ideal

level and this may be due to socioeconomic reasons and other technical difficulties.

REFERENCES

1. Chaturvedi VP, Mathur AG, Anand AC. Rational drug use as common as common sense? Med J Armed Forces India 2012;68:206-8.
2. WHO|Rational use of medicines. WHO. Available from: http://www.who.int/medicines/areas/rational_use/en. [Last accessed on 2018 May 21].
3. Globalburdenofdisease.Pdf. Available from: http://www.who.int/mip/2003/other_documents/en/globalburdenofdisease.pdf. [Last accessed on 2018 May 23].
4. How to Investigate Drug Use in Health Facilities: Selected Drug Use Indicators-EDM Research Series No. 007. Available from: http://www.apps.who.int/medicinedocs/en/d/Js2289e. [Last accessed on 2018 May 29].
5. Zhang Z, Zhai J, Wei Q, Qi J, Guo X, Zhao J, *et al.* Cost-effectiveness analysis of psychosocial intervention for early stage schizophrenia in China: A randomized, one-year study. BMC Psychiatry 2014;14:212.
6. Fleischhacker WW, Uchida H. Critical review of antipsychotic polypharmacy in the treatment of schizophrenia. Int J Neuropsychopharmacol 2014;17:1083-93.
7. Jyothsna CS, Nagarajaiah BH, Shivakumar KM. Drug utilization pattern in geriatric inpatients of medicine wards at a government tertiary care hospital. Natl J Physiol Pharm Pharmacol 2019;9:320-7.
8. Thara R, Kamath S. Women and schizophrenia. Indian J Psychiatry 2015;57 Suppl 2:S246-51.
9. Buoli M, Caldiroli A, Panza G, Altamura AC. Prominent clinical dimension, duration of illness and treatment response in schizophrenia: A naturalistic study. Psychiatry Investig 2012;9:354-60.
10. Wistedt B. Schizophrenia, a chronic disease. Acta Psychiatr Scand Suppl 1981;291:9-19.
11. Manschreck TC, Boshes RA. The CATIE schizophrenia trial: Results, impact, controversy. Harv Rev Psychiatry 2007;15:245-58.
12. Herrera JM, Alvarez WA, Freinhar JP, Lawson WB, Sramek JJ. Adjunctive clonazepam in the treatment of chronic schizophrenia. Int J Psychosom 1991;38:17-20.
13. Benzodiazepines for Schizophrenia. Available from: http://www.CD006391/SCHIZ_benzodiazepines-for-schizophrenia. [Last accessed on 2018 Nov 30].
14. Thakore JH, Berti C, Dinan TG. An open trial of adjunctive sertraline in the treatment of chronic schizophrenia. Acta Psychiatr Scand 1996;94:194-7.
15. Ogino S, Miyamoto S, Miyake N, Yamaguchi N. Benefits and limits of anticholinergic use in schizophrenia: Focusing on its effect on cognitive function. Psychiatry Clin Neurosci 2014;68:37-49.
16. Olfson M, Marcus SC, Ascher-Svanum H. Treatment of schizophrenia with long-acting fluphenazine, haloperidol, or risperidone. Schizophr Bull 2007;33:1379-87.
17. The Development of Standard Values for the WHO. Available from: http://www.archives.who.int/icium/icium1997/posters/1a2_txt.html. [Last accessed on 2018 Nov 30].

How to cite this article: Oommen S, Elango P, Alwar MC, Solomon S. Assessment of drug prescribing pattern in schizophrenia in a tertiary care hospital in South India. Natl J Physiol Pharm Pharmacol 2019;9(8):709-713.

Source of Support: Nil, **Conflict of Interest:** None declared.