Original Article

Pharmacology Section

A Retrospective Drug Utilization Study of Antidepressants in the Psychiatric Unit of a Tertiary Care Hospital

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ABSTRACT

Introduction: Drug utilization is the marketing, distribution, prescription and the use of drugs in a society. Antidepressant prescribing patterns have changed globally over the last few years. Hence, we wanted to observe the prescribing pattern of antidepressants at our hospital and assess the rationality of the prescriptions and the prevalence of antidepressant usage in the community.

Methods: A retrospective, observational analysis of the case records of patients who received antidepressant prescriptions at the Psychiatry outpatients clinic of a tertiary care hospital during the period from 1st January 2006 to 31st December 2006, to study the pattern and the rationality in prescription of antidepressant drugs, the WHO prescribing indicators, the Defined daily dose (DDD)/1000/day (DID), the Prescribed daily dose (PDD) and the PDD to DDD ratio.

Results: Antidepressants were prescribed in 76.18% prescriptions (duloxetine – 50%, escitalopram – 22.40%, mirtazapine – 17.19%, sertraline – 6.77% and others – 3.64%). The average number of drugs/prescription was 2.32, the number of drugs which were prescribed by their generic names was 88.54% and the number of drugs which were prescribed from WHO EML was 1.56%. There were no prescriptions for FDCs or injectibles. The DID of the antidepressants was 0.02 mg. The PDD to DDD ratios were < 1 for duloxetine and mirtazapine; for others, they were ≥1.

Conclusion: Antidepressants were the most commonly prescribed psychotropic medicines. Duloxetine, escitalopram, mirtazapine and sertraline were the most commonly used ones. The prescriptions were complete and without polypharmacy. Favourable and unfavourable outcomes were seen for 3 and 2 WHO prescribing indicators respectively. The antidepressant consumption in the community was low. Adequate dosing was seen for all the antidepressants, except for duloxetine and mirtazapine (under-dosing). Adherence to standard treatment guidelines, choosing drugs from the EML and restricting the prescription of concomitant sedative hypnotics will decrease the number of drugs and the cost of the therapy and they will promote the rational use of medicines.

Key Words: Antidepressants, Drug utilization, ATC, DDD, PDD

KEY MESSAGE

- There is a need for prospective drug utilization studies to adequately evaluate patient care and facility indicators. The prescribing habits among psychiatrists can be improved by creating awareness about the choice of drugs according to the standard treatment guidelines and from the Essential Medicines List. Prescriber education can also focus on the reduction in the prescriptions of concomitant sedative hypnotics. The prescribers should also be encouraged to check for the patients' compliance with the prescribed medications and to record them in the case sheets. Such measures will promote the rational use of medicines and ultimately, the quality of healthcare.

INTRODUCTION

The World Health Organisation (WHO) defines drug utilization as the marketing, distribution, prescription and the use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences [1]. Often, drugs are not used, keeping in mind their safety and efficacy [2]. Rational drug prescribing is the use of the least number of drugs to obtain the best possible effect in the shortest period and at a reasonable cost [3]. Irrational prescribing and disparity between the prescription and the consumption of medicines may offset the benefits which are demonstrated by randomized controlled trials on drug efficacy [4-7]. Moreover, the optimistic expectations of a drug, based on the results of clinical trials, may not materialize when they are used outside controlled settings [8]. The recent proliferation of new drugs, the increasing recognition of delayed adverse effects and the focus on pharmacoeconomic considerations have stimulated interest in the prescribing patterns of physicians [5].

Antidepressant prescribing patterns have changed globally over the last few years, with conventional drugs like tricyclics and MAO inhibitors being gradually replaced by selective serotonin reuptake inhibitors (SSRIS) and novel antidepressants. The prevalence of antidepressant usage in the community is rising in Western populations, with Iceland, Australia and Sweden having the highest consumption [9].

Therefore, our aim was to study the drug utilization of antidepressant drugs in the psychiatric unit of a tertiary care hospital in Pondicherry. Our objectives were:

- To observe the prescribing pattern of antidepressants among psychiatrists at our hospital
- To assess the rationality of the prescriptions
- To assess the prevalence of antidepressant usage in the community

MATERIALS AND METHODS

A retrospective observational study was carried out in the psychiatric unit of a tertiary care hospital in Pondicherry, which covered the period from 1st January 2006 to 31st December 2006. We used the following inclusion/exclusion criteria for the study:

Inclusion criteria:

1. All patients who attended the Psychiatry outpatients (OP) clinic of the hospital from 1st January 2006 to 31st December 2006.
2. All patients who were diagnosed with depressive or adjustment disorders (diagnosed as per the International Classification of Diseases – ICD 10 criteria) [11] or any condition where antidepressants were indicated.

Exclusion criteria:

1. Patients who did not receive antidepressant drugs.
2. Patients continuing on only those antidepressant drugs which were prescribed outside the hospital.

Case records of the Psychiatry outpatients clinic were taken from the medical records section of the hospital. The data were entered into a pre-designed proforma [Table/Fig-1].

1.	Outpatient Registration number
2.	Date
3.	Age
4.	Sex
5.	Address
6.	Domicile
7.	Education
8.	Marital status
9.	Occupation
10.	Income
11.	Registration by self/family
12.	Referring dept.
13.	Substance/Drug Dependence
14.	Primary diagnosis
15.	Co-morbidity
16.	Concomitant medications (psychotropic and non-psychotropic)
17.	Antidepressant(s) used
18.	Antipsychotic(s) used
19.	Mood stabilizer(s) used
20.	Doses of antidepressant, antipsychotic/ or mood stabiliser
21.	Any augmentation
22.	Was drug changed, and if so, the reason for change?
23.	Adverse drug reactions observed:
	• Neurological
	• Anti-muscarinic
	• Cardiovascular
	• Metabolic/endocrine
	• Gastro-intestinal
	• Psychiatric/Behavioural
	• Others

[Table/Fig-1]: Data collection sheet/proforma

By following the method of Baldessarini RJ et al [11] for defining drug use, we selected prescriptions containing at least one antidepressant as one prescription, from the multiple prescriptions in the case records with follow-up visits. Thus, if the initial prescription was continued, it was regarded as the same prescription for the given duration. Any dose change in that prescription was noted for calculating the drug consumption. The addition of another antidepressant to or a change of the antidepressant from the existing regimen was regarded as a separate prescription. In both the cases, the number of drugs in the prescription included the added or changed antidepressant(s), along with concomitant medications from the earlier prescription. However, prescriptions containing drugs for co-morbid conditions (non-psychiatric) which were not prescribed in the department of Psychiatry were excluded.

The data were then subjected to analysis for:

1. Demographic details (Age and gender distribution)
2. Psychiatric diagnosis
3. Antidepressant drugs prescribed
4. Rationality of the prescription according to the WHO prescribing indicators.
5. Defined daily dose (DDD) of the antidepressants per thousand inhabitants per day (DID)
6. Prescribed daily dose (PDD) of the antidepressants
7. The PDD to DDD ratio of the antidepressants

The Anatomical Therapeutic Chemical (ATC) classification and the Defined Daily Dose (DDD) per thousand inhabitants per day (DID) calculations were used for estimating the antidepressant use in the community.

By following the methodology which was outlined by the WHO [11], we calculated the DID as follows:

$$\frac{\text{Amount of antidepressant prescribed in 1 year (mg)} \times 1000 \text{ inhabitants}}{\text{DDD (mg)} \times 365 \text{ days} \times \text{Population of Pondicherry and Cuddalore}}$$

All patients belonged to either Pondicherry or the Cuddalore district of Tamil Nadu. So, for the calculation of DID, we used the population of Pondicherry as well as the Cuddalore district as per the available census.

The total number of DIDs was calculated by adding up the DIDs for the individual antidepressants.

The PDD was calculated as follows:

- For each prescription, there were multiple doses of the antidepressants. We took the average of the daily doses for the antidepressant as the PDD. This process was repeated for all the indications of each antidepressant and the final value was the average of the PDDs which were thus obtained.
- The PDD to DDD ratio was then calculated.

Statistical analysis: A descriptive statistical analysis was carried out in the present study. The results on the continuous measurements were presented as Mean ± SD (Min-Max) and the results on the categorical measurements were presented as Number (%). The significance was assessed at a 5% level of significance ($P<0.05$) with 95% confidence interval. The following assumptions were made on the data:

1. The dependent variables should be normally distributed.
2. Samples which are drawn from the population should be random and the cases of the samples should be independent.

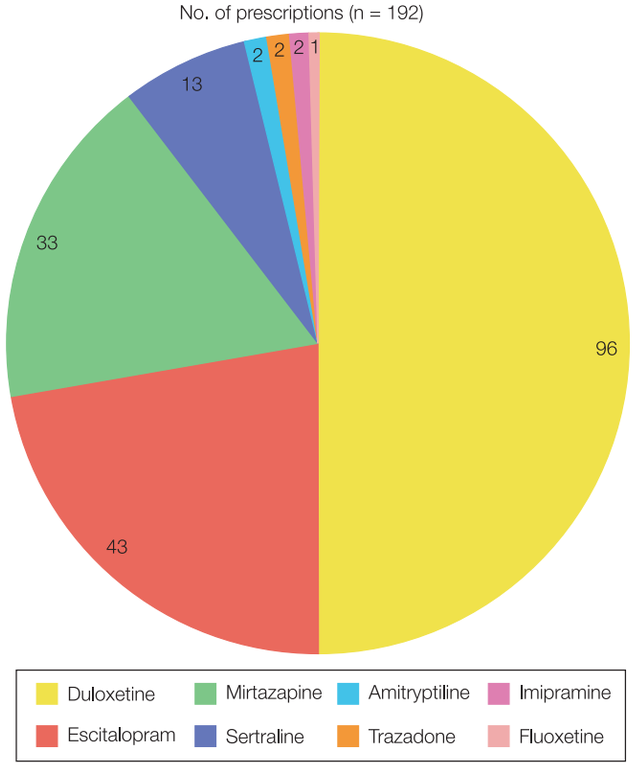
The Chi-square/Fisher's Exact test was used to find the significance of the study parameters on the categorical scale between two or more groups. All statistical calculations were carried out with SPSS Statistical package (Version 15.0).

As it was a non-interventional study, the institutional research committee granted a waiver on the assurance that the subject confidentiality would be maintained. We took the following steps in this regard:

1. Identification of patients by the hospital number only and not by name.
2. Case records to be accessed by investigators in the Medical Records section only.
3. Patient details not to be divulged to any party other than the co-investigators.
4. Proformas to be destroyed after the conclusion of the study.

RESULTS

Out of 222 patients who received psychotropic medicines during the study period, 170 (76.58%) received one or more antidepressants. [Table/Fig-2] shows the different antidepressants which were prescribed.



[Table/Fig-2]: Prescribing frequency of the antidepressants

The age distribution of the patients who received antidepressants is shown in [Table/Fig-3 & 4].

Among these 170 patients, 82 were males and 88 were females. The gender distribution of the patients who received antidepressants is shown in [Table/Fig-5].

The distribution of the primary psychiatric diagnoses of the patients who received antidepressants is shown in [Table/Fig-6].

The total number of prescriptions which were given was 192 and a total of 446 drugs were prescribed. Of them, 192 were antidepressant medications of 8 types, as per the ATC class. The number of antidepressant prescriptions along with their indications is shown in [Table/Fig-7].

A change of antidepressant was required on 18 occasions. Duloxetine was substituted on 10 occasions, escitalopram on 4, mirtazapine on 3 and imipramine on 1 occasion. The addition of a second antidepressant was seen on 3 occasions because of the poor response with a single drug. Of them, duloxetine was the first antidepressant on 2 occasions and mirtazapine on 1.

[Table/Fig-8] shows the concomitant medications which were prescribed in the Department of Psychiatry.

[Table/Fig-9] shows the number of drugs per prescription among the 192 prescriptions. More than 5 drugs were not prescribed to any patient.

As per the WHO prescribing indicators, we observed:

- Average number of drugs per prescription: 2.32 (446/192)
- Percentage of antidepressant drugs which were prescribed by their generic names: 88.54% (170/192 × 100)
- Percentage of fixed dose combinations (FDCs) of antidepressants: Nil

Antidepressant drugs	Number of prescriptions (n = 192)	Mean age in years	SD
Duloxetine	96	35.32	12.44
Escitalopram	43	29.43	8.75
Imipramine	2	17.00	14.14
Mirtazapine	33	34.59	10.44
Sertraline	13	42.08	16.32
Trazodone	2	40.50	3.54
Amitriptyline	2	53.0	0.00
Fluoxetine	1	70.00	–

[Table/Fig-3]: Age distribution for prescriptions according to Antidepressant drugs

Antidepressant drugs	Number of prescriptions (n = 192)	Age in years				P-value
		1–20	21–40	41–60	> 60	
Duloxetine	96 (56.5%)	9 (60%)	60 (53.6%)	24 (66.7%)	3 (42.9%)	0.474
Escitalopram	43 (25.3%)	3 (20%)	35 (31.3%)	5(13.9%)	0 (0%)	0.083+
Imipramine	2 (1.2%)	1 (6.7%)	1 (0.9%)	0 (0%)	0 (0%)	0.214
Mirtazapine	33 (19.4%)	2 (13.3%)	25 (22.3%)	5 (13.9%)	1 (14.3%)	0.547
Sertraline	13 (7.6%)	0 (0%)	7 (6.3%)	3 (8.3%)	3 (42.9%)	0.003**
Trazodone	2 (1.2%)	0 (0%)	1 (0.9%)	1 (2.8%)	0 (0%)	0.769
Amitriptyline	2 (1.2%)	(0%)	0 (0%)	2 (5.4%)	0 (0%)	0.290
Fluoxetine	1 (0.6%)	0 (0%)	0 (0%)	0 (0%)	1 (14.3%)	<0.001**
Total	170 (100%)	15 (100%)	112 (100%)	37 (100%)	7 (100%)	–

[Table/Fig-4]: Age distribution for prescriptions according to Antidepressant drugs

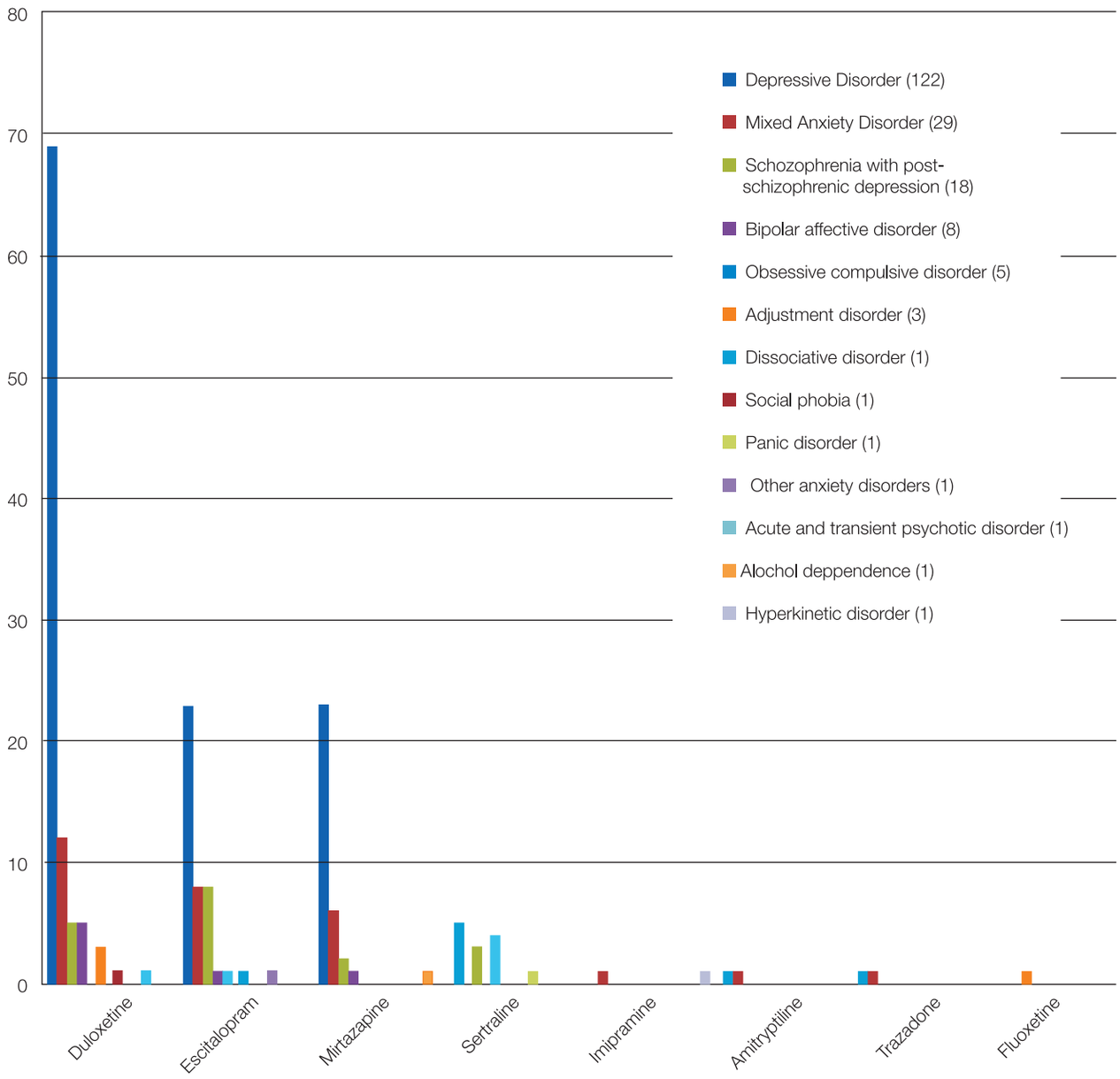
- Percentage of encounters for prescribing injections of antidepressants: Nil
- Percentage of antidepressant drugs which were prescribed from the Essential Medicines List (16th EML of WHO): 1.56 % (3/192 × 100)

Antidepressant drugs	Number of prescriptions (n = 192)	Gender		P value
		Female (n = 88)	Male (n = 82)	
Duloxetine	96 (56.5%)	48 (54.5%)	48 (58.5%)	0.600
Escitalopram	43 (24.7%)	26 (29.5%)	17 (20.7%)	0.246
Imipramine	2 (1.2%)	0 (0%)	2 (2.4%)	0.231
Mirtazapine	33 (20%)	21 (25.6%)	12 (13.6%)	0.032*
Sertraline	13 (7.6%)	6 (6.8%)	7 (8.5%)	0.674
Trazodone	2 (1.2%)	0 (0%)	2 (2.4%)	0.498
Amitriptyline	2 (0.6%)	1 (1.1%)	1 (1.2%)	1.000
Fluoxetine	1 (0.6%)	0 (0%)	1 (1.2%)	0.482

[Table/Fig-5]: Gender distribution of prescriptions according to Antidepressant drugs

Diagnosis	No of patients	%	No of prescriptions
Depressive disorder	107	62.94	122
Mixed Anxiety and Depressive disorder	25	14.79	29
Schizophrenia with post schizophrenic depression	16	9.47	18
BPAD	7	4.14	8
OCD	5	2.96	5
Adjustment disorder	3	1.78	3
Dissociative disorder	1	0.59	1
Social phobia	1	0.59	1
Panic disorder	1	0.59	1
Other Anxiety disorders	1	0.59	1
Acute and Transient psychotic disorder	1	0.59	1
Alcohol Dependence	1	0.59	1
Hyperkinetic disorder	1	0.59	1

[Table/Fig-6]: Primary ICD 10 psychiatric diagnoses of patients receiving antidepressants



[Table/Fig-7]: Indications for Antidepressants used

Percentage of drugs which were prescribed from the National List of Essential Medicines (NLEM, endorsed 2002) was 2.60 % (5/192 × 100).

The ATC coding, DDD and the calculation of DID are summarized in [Table/Fig-10]. The total number of DIDs of the antidepressants was 0.02.

The PDD and the PDD to DDD ratios are also summarized in [Table/Fig-10].

DISCUSSION

Antidepressants were prescribed more in females than in males. This was consistent with the findings of other studies [13, 14]. Mirtazapine was prescribed significantly (P<0.05) more in females than in males. The age distribution shows that the majority of patients who received the antidepressants belonged to the 21-40 years age group, in contrast to the results of a study on antidepressant use in East Asia, wherein the mean age of the patients who received antidepressant prescriptions was more than 40 years [15]. In another study in Europe, where antidepressants were the second most commonly prescribed psychotropic drugs, a majority of the users were between 35 and 49 years, with a mean age which was greater than 40 years [14]. Preferential prescription of sertraline in the 21-40 years age group and of fluoxetine in patients above 60 years was highly significant (P<0.01) as compared to other age groups. There was also a suggestive correlation between prescriptions of escitalopram and 21-40 years age group.

Drug class	No of occasions	% (Out of 192 prescriptions)
Sedative hypnotics	125	65.10
Antipsychotics	53	27.60
Mood stabilisers	17	8.85
Trihexiphenidyl	6	3.13
Acamprosate	1	0.52
Vitamin B 1	1	0.52
Propranolol	1	0.52

[Table/Fig-8]: Concomitant medications prescribed in the department of Psychiatry

No of drugs per prescription	No of prescriptions (n=192)	%
1	34	17.71
2	97	50.52
3	35	18.23
4	23	11.98
5	3	1.56

[Table/Fig-9]: Number of drugs per prescription

Depressive disorder was the most common psychiatric diagnosis among the population (n=222), with a prevalence of 47.75%. It was also the most common indication for using antidepressants (62.72%), followed by mixed anxiety, depressive disorder and schizophrenia, with post schizophrenic depression among the top three diagnoses.

Antidepressants were the most common psychotropic drugs which were prescribed (76.58%). The choice of the antidepressant was based on the ICD diagnosis, the severity of the disease/disorder, co-morbidity, drug efficacy and considerations for the patients' tolerability. Most common antidepressant which was prescribed was the selective noradrenaline reuptake inhibitor (SNRI), duloxetine (50%). The newer antidepressants – duloxetine, escitalopram, sertraline and mirtazapine accounted for the bulk of prescriptions (96.36%), which followed the global trend towards antidepressant prescribing [15-19]. In many studies, selective serotonin reuptake inhibitors (SSRIs) accounted for the bulk of the prescribed antidepressants, with high prescribing rates [15-18]. In our study, the SSRIs – escitalopram, sertraline and fluoxetine were prescribed on 57 out of192 occasions (29.69%). Among the SSRIs, escitalopram was the preferred drug. Again, this was in contrast to findings of the east Asian study on antidepressant use, wherein fluoxetine and sertraline were prescribed more frequently than escitalopram and the use of escitalopram use was lower than that of trazodone, mirtazapine, imipramine and amitryptiline. However, the prescribing rates of the tricyclic antidepressants, imipramine and amitryptiline were lower than the prevailing norms for their use [15]. The doses of antidepressants were decided upon according to the severity of the disease/disorder, starting with low doses and titrating upwards or downwards according to the clinical response and the patients were kept on regular follow-up. Duloxetine was the most common antidepressant which was prescribed for depressive disorder (56.56%), mixed anxiety and depressive disorder (41.38%) and for BPAD (62.50%). The most common antidepressant which was prescribed for Schizophrenia with post-schizophrenic depression was escitalopram (44.44%), and for OCD, sertraline was prescribed (80%). However, the widespread use of duloxetine as the first line drug did not conform to the National institute of Clinical Excellence or the American Psychiatric Association guidelines for the prescribing of antidepressants which existed at that time, wherein SSRIs were unanimously regarded as the first choice agents [20, 21].

The prescription of a single antidepressant was common and it occurred in 98.44% of the cases. The reasons for changing an antidepressant were poor therapeutic response or intolerable adverse effects. Duloxetine was the most commonly substituted antidepressant. It was also the most common antidepressant for which an adjunctive antidepressant drug was prescribed.

Drug	ATC Code	DDD (mg)	DDDs/1000 inhabitants/day (DID)	PDD (mg)	PDD/DDD
Duloxetine	N06AX21	60	0.0025	40	0.66
Escitalopram	N06AB10	10	0.0019	10	1.00
Mirtazapine	N06AX11	30	0.0004	22.50	0.75
Sertraline	N06AB06	50	0.0007	150	3.00
Imipramine	N06AA02	100	0.0003	100	1.00
Trazodone	N06AX05	300	0.0019	300	1.00
Amitryptiline	N06AA09	75	0.012	100	1.33
Fluoxetine	N06AB03	20	0.000007	20	1.00

[Table/Fig-10]: ATC/DDD classification with calculated DID values of prescribed antidepressants

Sedative hypnotics were the most common group of drugs which were prescribed (65.10%) concomitantly with antidepressants, followed by antipsychotics, mood stabilizers, trihexiphenidyl, acamprosate, propranolol and vitamin B1. Except for Vitamin B1 which was prescribed for alcohol dependence, and propranolol, which was prescribed for the treatment of tremors, all others were psychotropic medications. Trihexiphenidyl was prescribed to counter the extrapyramidal adverse effects of concomitant antipsychotics.

Rational prescribing was followed as per the principles of prescription order writing [22]. Considering the definitions of polypharmacy which are most commonly cited, there was no polypharmacy, because there was no prescription of antidepressant medication which did not match the diagnosis and there was no prescription with more than 5 drugs [23]. 68.23% of the prescriptions (131 out of 192) had 2 drugs or less, which was recommended. However, there were cases where incorrect diagnosis led to the prescribing of inappropriate drugs initially; it was rectified when the primary diagnosis was revised on follow up. The clinicians' choice of drugs was not based primarily on the affordability for the patient and so the cheapest drug was not always prescribed.

The average number of drugs per prescription was more than 2, which was high. Prescribing by generic names was high (88.54%). No fixed dose combinations (FDCs) or injectible preparations were prescribed, which indicated rational prescribing practices. The percentage of drugs which were prescribed from the 16th WHO Essential Medicines List and the National Essential Medicines List (endorsed 2002) was low.

The anatomical therapeutic chemical (ATC) classification system divides drugs into different groups according to the organ or system on which they act and their chemical, pharmacological and therapeutic properties [24, 25]. Each drug is assigned a particular combination of letters and numbers. The defined daily dose (DDD) is the assumed average maintenance dose per day for a drug which is used for its main indication in adults [24]. DDD was developed to overcome the objections against the traditional units of the measurement of drug consumption and to ensure comparability between the drug utilisation studies which were carried out at different locations and at different time periods. The total DID of the antidepressants showed low consumption, in sharp contrast to the trends of western European countries and the USA, especially during the last decade, with high rates of antidepressant prescribing and consumption [9, 26, 27]. The DID for duloxetine can be interpreted as 0.0025 out of 1000 patients or 0.025% patients would have used a dose of 60mg. Similarly, the DIDs of escitalopram, mirtazapine, sertraline, imipramine, trazodone, amitryptiline and fluoxetine can be interpreted as the consumption of their respective DDDs by a population of 0.019%, 0.004%, 1.007%, 0.003%, 0.019%, 0.12% and 0.00007% patients.

The prescribed daily dose (PDD) is defined as the average dose which is prescribed according to a representative sample of prescriptions. It is important to relate the PDD to the diagnosis on which the dosage is based. The PDD will give the average daily amount of a drug that is actually prescribed. PDD is especially important for drugs where the recommended dosage differs from one indication to another (e.g. psychotropic drugs). When there is a substantial discrepancy between the PDD and the DDD, it is important to take this into consideration when evaluating and interpreting drug utilization figures, particularly in terms of morbidity [28].

The ratio of PDD to DDD is often used as an indication of the adequacy of dosing. A ratio which was less than 1, as was seen in case of duloxetine and mirtazapine, indicated under-dosing. A ratio which was greater than 1 was seen for sertraline and amitryptiline. All other antidepressants showed a PDD to DDD ratio which was equal to 1, thus reflecting the adequacy of the dosing in these cases [29].

LIMITATIONS OF THE STUDY

Our results should however be seen in the light of our small sample size, as compared to the studies with which they have been compared. The limitations of this study were the lack of patient care indicators and some of the facility indicators like the availability of drugs and the impact of cost on the drug treatment, which can increase the utility of the study, but they can only be derived from a prospective design. As with any drug utilization study, it was not possible to monitor the actual use or compliance with the prescribed antidepressant, more so, as it was a retrospective study of case records, where notes on compliance were lacking. Moreover, we could not quantify the data on the comparative clinical effectiveness of the antidepressants.

STRENGTHS OF THE STUDY

The strengths of this study are the use of a structured proforma for data collection with the details of drug prescriptions on follow up visits, and a comprehensive application of drug utilization tools like the ATC/DDD classification and the calculation of the DID and the PDD/DDD ratios to assess the prevalence of antidepressant use in the community of the study population. The documentation of the longitudinal follow-up data gave a better idea of the drug consumption than the cross sectional data. The data on drug substitutions and augmentations as well as concomitant psychotropic medications have also been provided.

CONCLUSION

Our study shows that depressive disorder was the most common psychiatric diagnosis in the population and that antidepressants were the most commonly prescribed psychotropic medicines. There was a higher prevalence of antidepressant prescribing for women. A majority of the antidepressants were prescribed to young and older adults between 21and 40 years. The SNRI, duloxetine, the SSRIs, escitalopram and sertraline and the atypical antidepressant, mirtazapine, were the most commonly prescribed antidepressants, with or without other concomitant psychotropic medicines. The preference for duloxetine over SSRIs as the first line drug in depressive disorders did not conform to the standard prescribing guidelines. Most of the patients were treated by a single antidepressant. However, poor response and/or tolerability considerations made the prescribers change the antidepressant or add a second antidepressant. Antidepressants were prescribed for many indications other than depressive disorders and the psychiatrists' choice of the drug was influenced by the diagnosis, the severity of the disease/disorder, co-morbidity, drug efficacy, and the considerations for the patients' tolerability, but not primarily on the cost of medication. The prescriptions were complete and polypharmacy was not seen. Favourable and unfavourable outcomes were seen for 3 and 2 WHO prescribing indicators respectively. The consumption of antidepressants in the community was low. Adequate dosing was seen for all the antidepressants, except for duloxetine and mirtazapine, for which under-dosing was prevalent.

RECOMMENDATIONS

There is a need for prospective drug utilization studies to overcome some of the limitations of our study. The prescribing habits among psychiatrists should follow a standard treatment national or international guidelines. They can be improved further by creating awareness about the choice of drugs from the Essential Medicines List and by reducing the prescription of sedative hypnotics. Such measures can decrease the number of drugs per prescription and also the cost of therapy. The prescribers should also be encouraged to check for the patients' compliance with the prescribed medications and to record them in the case sheets. Such measures will promote the rational use of medicines and ultimately, the quality of healthcare.

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