



Original Research Article

Assessment of drug utilization pattern and adverse drug monitoring among patients on antipsychotic drugs in a tertiary care hospital of Bihar: An observational and prospective study

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ABSTRACT

Objective: There is increasing trend among psychiatrists to use newer psychotropic medications in their practice. Assessing the pattern of prescription and setting standards according to it should become part of clinical practice. Keeping this in mind, present study was planned to highlight the utilization pattern, comparing it with other studies and assess safety outcomes.

Materials and Methods: This was an observational and prospective study. One hundred forty-three (n=143) prescriptions were analysed and were followed up for 12 months. Patient on psychotropic drugs were screened for suspected Adverse Drug Reactions (ADRs) and were reported to AMC (Adverse Drug Reaction Monitoring Centre), Department of Pharmacology.

Result: Total 514 drugs were prescribed in 143 prescriptions. Total number of antipsychotic drugs prescribed was 375. The average number of antipsychotic drugs per prescription was 2.62. Among Antipsychotics atypical antipsychotics (64.52%) were prescribed more than typical antipsychotics (39.02%). Most commonly reported ADR was weight gain (28.38%) followed by sedation (14.19%), tremor (12.16%) and akathisia (10.81%). 6.08% of ADRs were Gastrointestinal side effects. Weight gain was found exclusively in atypical antipsychotics while tremor and akathisia were found mostly in typical ones.

Conclusion: Polypharmacy was avoided in prescriptions. Atypical antipsychotics were prescribed more than typical ones with olanzapine having highest percent drug utilisation. But this trend is increasing burden of obesity and metabolic syndrome in old age populations. The study results strongly suggest the need for healthcare team to focus on assessing and reporting suspected ADRs for enhancing the quality of monitoring and managing ADRs.

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1. Introduction

Psychiatric disorders are associated with significant problems in social, occupational and other important activities.¹ Psychiatric disorders are more common in low and middle income countries.² Psychiatric disorders are one of the four leading health conditions contributing to Disability Adjusted Life Years (DALYs).³

A wide range of psychotropic drugs are available for the treatment of psychiatric disorders.⁴ There is increasing trend among psychiatrists to use newer psychotropic medications in their practice. This needs vast study on the utilization pattern of these drugs and their outcomes in terms of real life effectiveness and safety.⁵ Various factors like efficacy, costs, safety and local paradigms play role in selection of drug therapy and thus affect the outcomes. Without the knowledge of utilization pattern of drug, it is impossible to give suggestions on rational prescribing of

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antipsychotic drugs.

Drug utilization studies are essential for the formulation of drug policies. It helps in identifying the problems arising from drug usage in health care delivery system. It also highlights the current approaches to the rational use of drugs. WHO defines drug utilization studies as the marketing, distribution, prescription and use of drug in a society, considering its consequences, either medical, social or economic.⁶

Apart from describing drug use pattern and prescribing behaviour, measurement of drug use in health facilities also helps in identifying factors responsible for the practice of poly-pharmacy and associated problems.⁷

Patients with psychiatric illness often needs lifelong therapy with antipsychotic drugs which predisposes them to wide range of Adverse Drug Reactions (ADRs).⁸ Weight gain, somnolence, headache, tremors and tardive dyskinesia are the common side effects associated with antipsychotic drugs. These adverse effects lead to deterioration in the physical and mental well-being of the patient and contribute to patient non-adherence to therapy.

Assessing the pattern of prescription and setting standards according to it should become part of clinical practice. Keeping this in mind, present study was planned to highlight the utilization pattern, comparing it with other studies and assess safety outcomes.

2. Materials and Methods

2.1. Study site/place

Outpatient Department of Psychiatry, Indira Gandhi Institute of Medical Sciences, Patna.

2.2. Study duration

18 months from February 2018 to July 2019, first 6 months were for recruitment of patients and 12 months were for follow up.

2.3. Materials

Prescription of patients visiting outpatient department.

2.4. Study design

This was an observational and prospective study in which prescriptions were collected on Mondays and Thursdays from OPD of Psychiatry Department of IGIMS, Patna. Study was started after approval from Institutional Ethics Committee of IGIMS, Patna.

2.5. Inclusion criteria

1. Patients between 12 to 60 years of age and of all gender
2. Patients visiting the psychiatry OPD

3. Patients receiving antipsychotic drugs
4. Diagnosis of psychiatric illness as per ICD 10 criteria⁹

2.6. Exclusion criteria

1. Patients below 12 years of age and above 60 years of age.
2. Prescriptions without any psychotropic drugs.
3. Patients with diagnosis of Mental retardation and Dementia.
4. Patients on stimulant drugs.

In 6 months, approximately 2060 patients attended psychiatry OPD. Out of which approximately 687 patients attended on Mondays and Thursdays OPD. As per protocol of this study, every alternate patient was selected. In recruitment phase we have interviewed 341 patients. Of these 341 patients 34 patients did not meet the inclusion criteria. In follow up period, 164 patients were lost to follow up. So finally, we were left up with 143 patients.

Patient on psychotropic drug were screened for suspected ADRs and were reported to AMC (Adverse Drug Reaction Monitoring Centre), Department of Pharmacology. The screening was carried out by senior residents of psychiatry department for interviewing psychiatric patients.

Prescriptions were analysed on the basis of:

1. Age distribution.
2. Most frequently prescribed drugs.
3. The prescribed drugs were classified according to the Anatomical Therapeutic Chemical (ATC)-Defined Daily Dose (DDD) Classification. In the ATC classification system, the active medical substances are grouped according to the organ or system on which they act and also according to their pharmacologic, therapeutic and chemical properties.
4. The prescribed Daily Dose (PDD) was calculated by taking the average of the daily doses of psychotropic drugs. The PDD to DDD ratio was then calculated. Due to variation between different regions, a technical unit of measurement, the Defined Daily Dose (DDD) was created to compare drug consumption at international level. Defined Daily Dose (DDD) is the assumed average maintenance dose per day for a drug used for its main indication in adults.¹⁰ The prescribed daily dose (PDD) is defined as the average dose prescribed according to a representative sample of prescriptions.¹¹ The PDD will give the average daily amount of a drug that is actually prescribed.

2.7. Statistical analysis

Results obtained from this study were presented in tabular form and data were interpreted by using Microsoft Excel 2007 software.

3. Results

Table 1: Distribution of patients on basis of age group

Age Group	Number of patients (%) (n = 143)
12-20	11 (7.69)
21-30	39 (27.27)
31-40	56 (39.16)
41-50	16 (11.19)
51-60	21 (14.68)

Table 2: Distribution of patients on basis of gender

Sex	Number of patients (%) (n=143)
Male	66 (46.15)
Female	77 (53.85)

PDD/DDD value of only one drug lurasidone was greater than 1. PDD/DDD values of most of the drugs were less than 1 and close to 1.

4. Discussion

In our study, the reproductive age group (20–40 years) accounted for the majority of all the psychiatric disorders, as has been seen in many other studies.^{12–14} 7.69% of the patients were of age group 12-20 years, 27.27% in 21-30 age group, 39.16% in 31-40 age group, 11.19% in 41-50 age group and 21% of the total patients were between 51 to 60 years of age. Dutta et al. found that 68 patients (57.62%) were <30 years of age and 50 (42.37%) were >30 years.¹⁵ Piparva et al. found that Majority of the psychiatric illnesses (78%) were observed in the age group of 25 to 54 years in both sexes.¹²

In our study, more female patients (53.85%) visited the psychiatry OPD than men (46.15%). Thakkar et al. found that the percentage of female and male patients was 51.8% and 48.2%, respectively.¹⁶ Ilyaz et al. found in their study that out of 500 patients, males and females were 46.8% and 53.2% respectively.¹⁷

Total 514 drugs were prescribed in 143 prescriptions. Total number of antipsychotic drugs prescribed was 375. The average number of antipsychotic drugs per prescription was 2.62. Lahon et al. found that the average number of drugs/ prescriptions in their study was 2.32.¹⁸ Piparva et al. found that the numbers of psychotropic drugs prescribed per patient in their study was 2.96.¹² Since, no prescription had more than five drugs, we can say that polypharmacy was avoided. Polypharmacy can lead to poor compliance, drug interactions, adverse drug reactions, under-use of effective treatments and medication errors.^{19,20}

Among Antipsychotics atypical antipsychotics (64.52%) were prescribed more than typical antipsychotics (39.02%). Among atypical antipsychotics percent drug utilisation was most in olanzapine (18.93%), followed by risperidone

Table 3: Distribution of suspected ADRs according to responsible antipsychotic drugs

ADRs	Total (%)	Drugs									
		Typical Antipsychotics					Atypical Antipsychotics				
		Flupenthixol	Haloperidol	Trifluoperazine	Levosulpiride	Olanzapine	Quetiapine	Lurasidone	Amisulpride	Risperidone	
Weight Gain	42 (28.38)	-	-	-	-	10	19	3	3	7	
Sedation	21 (14.19)	-	-	-	-	7	7	4	3	-	
Insomnia	9 (6.08)	-	-	-	-	4	-	-	5	-	
Headache	7 (4.73)	-	-	-	-	4	3	-	-	-	
Akathisia	16 (10.81)	5	3	6	2	-	-	-	-	-	
Tremor	18 (12.16)	6	3	7	2	-	-	-	-	-	
Dry Mouth	12 (8.10)	-	-	-	-	3	4	2	3	-	
Anorexia	5 (3.38)	-	-	-	-	-	-	1	-	4	
Sexual	1 (0.68))	-	-	-	-	-	1	-	-	-	
Dysfunction		-	-	-	-	-	-	-	-	-	
Abdominal	5 (3.38)	-	-	2	-	2	1	-	-	-	
Pain		-	-	-	-	-	-	-	-	-	
Constipation	4 (2.70)	-	-	-	-	-	-	1	1	2	
Rash	3 (2.03)	-	-	-	-	-	1	1	-	1	
Palpitation	5 (3.38)	-	1	-	-	-	1	-	-	2	
Total	148	11	7	15	4	30	37	13	15	16	

Table 4: Utilisation of antipsychotic drugs

Name of Drug	No of Drug Utilized					
	No of patients (%)	12-20 age group	21-30 age group	31-40 age group	41-50 age group	51-60 age group
Typical Antipsychotics						
Flupenthixol	33 (8.80)	4	10	14	3	2
Haloperidol	67 (17.87)	7	20	27	7	6
Trifluoperazine	33 (8.80)	3	12	15	2	1
Atypical Antipsychotics						
Levosulpride	41 (10.93)	5	13	18	3	2
Olanzapine	71 (18.93)	6	19	27	10	9
Quetiapine	38 (10.13)	4	11	15	4	4
Lurasidone	21 (5.60)	2	5	8	3	3
Amisulpride	23 (6.13)	2	6	9	2	4
Risperidone	48 (12.80)	5	15	20	5	3
Total	375	38	111	153	39	34

Table 5: ATC/DDD classification, PDD values and PDD/DDD ratio of psychotropic drugs prescribed in a sample of 500 patients

Drug	ATC Code	DDD	PDD	PDD/DDD
Typical Antipsychotics				
Flupenthixol	N05AF01	6 mg	4.5 mg	0.75
Haloperidol	N05AD01	8 mg	7.7 mg	0.99
Trifluoperazine	N05AB06	20 mg	17.5 mg	0.875
Atypical Antipsychotics				
Levosulpride	N05AL07	400 mg	75 mg	0.1875
Olanzapine	N05AH03	10 mg	8.5 mg	0.85
Quetiapine	N05AH04	400 mg	295 mg	0.74
Lurasidone	N05AE05	60 mg	75 mg	1.25
Amisulpride	N05AL05	400 mg	385 mg	0.96
Risperidone	N05AX08	5 mg	4.5 mg	0.9

(12.80%), quetiapine (10.13%), levosulpride (9.2%), amisulpride (6.13%) and lurasidone (5.60%). Among typical antipsychotics percent drug utilisation was most in haloperidol (17.87%) followed by Flupenthixol (8.80%) and trifluoperazine (8.80%).

There have been some important studies which brought to light the finding that 1st generation drugs are as useful as the 2nd generation drugs, with the exception of clozapine which outperforms all.^{21,22} In 2009 the American Psychiatric Association (APA) acknowledged the fact that the distinction between first- and second-generation antipsychotics appear to have limited clinical utility.²³ Also, the National Institute of Clinical Excellence (NICE) guidelines - 2010, suggested that it is no longer imperative to prescribe an “atypical” agent as first line treatment.²⁴ Paul et al. found in their study that the most common antipsychotic was olanzapine followed by risperidone.²⁵ Nukala et al. found in their study that risperidone was the most commonly prescribed (52.88%) followed by olanzapine (28.84%), quetiapine (10.57%), aripiprazole (8.65%), amisulpride (7.69%) and lurasidone (3.84%).²⁴ This showed a trend towards the use of newer atypical antipsychotics which are known to be better tolerated with less extrapyramidal symptoms than the

typical antipsychotics.²⁶

Most commonly reported ADR was weight gain (28.38%) followed by sedation (14.19%), tremor (12.16%) and akathisia (10.81%). 6.08% of ADRs were Gastrointestinal side effects. Weight gain was found exclusively in atypical antipsychotics while tremor and akathisia were found mostly in typical ones. Piparva et al. found in their study that weight gain, dizziness, sleep disturbance and appetite disturbance accounted for nearly 78% of the total events.²⁷ In a study conducted by Chawla et al. in a tertiary care hospital in delhi, it was found that of the total 224 patients, 38 adverse drug events occurred. Adverse drug events were mostly with risperidone (10), followed by olanzapine (8) owing to high usage.²⁸ Out of total 21 cases of sedation as an adverse effect, 7 cases were noted in patients receiving quetiapine and olanzapine each. Akathisia and tremor were mostly reported by patients receiving typical antipsychotics. Sridhar et al. found that atypical antipsychotics followed by selective serotonin reuptake inhibitors (SSRIs) were the most commonly involved psychotropic medications involved in ADRs.²⁹

When the PDD/DDD ratio is either less than or greater than one, it may indicate that there is either under or over utilization of drugs. Nevertheless, it is important to note that

the PDD can vary according to patient and disease factors. In our study, PDDD/DDD values of most of the drugs were close to 1 which signifies that drugs were not under-utilized or over-utilized.

5. Conclusion

Reproductive age group accounted for the majority of all the psychiatric disorders. More females visited the psychiatry OPD than males. The average number of antipsychotic drugs per prescription was 2.62. Since, no prescription had more than five drugs, we can say that polypharmacy was avoided. Atypical antipsychotics were prescribed more than typical ones with olanzapine having highest percent drug utilisation. Most commonly reported ADR was weight gain followed by sedation, diarrhoea and insomnia. Psychiatrists are preferring atypical antipsychotics over typical ones but this trend is increasing burden of obesity and metabolic syndrome in old age populations. The study results strongly suggest the need for healthcare team to focus on assessing and reporting suspected ADRs for enhancing the quality of monitoring and managing ADRs. PDDD/DDD values of most of the drugs were close to 1 which signifies that drugs were not under-utilized or over-utilized.

6. Source of Funding

None.

7. Conflict of Interest

None.

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