Research Article

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Monitoring adverse drug reaction of psychopharmacological agents: a pharmacovigilance study in tertiary care centre

Abstract

Objective: The main purpose of this study was to adverse drug reaction monitoring of psychopharmacological agents.

Materials and method: The study was cross sectional and was carried out in Departments of Psychiatry in Chhatrapati Shivaji Subharti Hospital and Pharmacology Department, Subharti Medical College, Meerut the duration of this study was approx 6 months (24 weeks). Institutional ethics committee approval was obtained before the start of the study.

Results: A total of 110 patients enrolled in the study, and it occurs 148 adverse events. Among which the male patients were 65 (59%). and female were 45(31%). The most common age group whereas 44.5% were from a higher age group. 40 % patients were in the age group from 36 years up to 55 years. In this study most common adverse effect is found in metabolic syndrome such as these were weight gain 15.45%, change in blood glucose 18.18% and change in cholesterol 9.09%. Antipsychotics were given to 35. % patients, antidepressants to 24.5 %, sedatives and hypnotics were given to 20.9 %, anti epileptic to 10.9%, anti maniac drugs to 5.5% and other drugs 3.0% patients. More patients suffering of 25.45% from anti depressant. This study severity of adverse effects. 70(63.6%) had mild adverse effects where as 40(36.4%) had moderate adverse effects and none had severe adverse effects.38% were definitely preventable, 35% were probably preventable, and 27% were not preventable as per clinical evaluations and application of scale

Conclusion: the study results strongly suggests the need for professional healthcare team to focus on assessing and reporting suspect adverse effect to increase the quality of monitoring and managing ADRs. Pharmacovigilance improvement the recognition of ADRs and helps the medical health care professional to have safe practice.

Keywords: psychiatric disorders, pharmacovigilance study, adverse effect of anti psychotic drug

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Introduction

Health is defined as a state of complete physical, mental and social well being and not merely the absence of disease or infirmity. Mental and behavioral disorders are found in people of all countries and all societies. An analysis done by WHO (Global burden of disease, 2000) shows that the neuropsychiatric conditions had point prevalence of about 10% for adults. About 450 million people are estimated to be suffering from neuropsychiatric conditions and it is one of the major causes of mortality and morbidity worldwide.[1,2] Surveys of morbidity carried out in various parts of India suggests a morbidity rate of not less than 18-20 per 1000, and the type of illness and prevalence is very much the same as in other parts of the world.[3] Mental disorders contribute to a significant load of morbidity and disability, even though few conditions account for an increasing mortality. As per Global Burden of Disease report, mental disorders accounts for 13% of total "the disability- adjusted life year (DALYs) lost for Years Lived with Disability (YLD) with depression being the leading cause.[4]

An adverse drug reaction (ADR) is defined by the World Health Organization (WHO) as "any response to a drug which is noxious and unintended, and which occurs at doses normally used in man for prophylaxis, diagnosis, or therapy of disease, or for the modification of physiological function".[5] Pharmacovigilance is defined as the pharmacological science relating to the detection, assessment, understanding and prevention of adverse effects, particularly long-term and short-term adverse effects of medicines.[6] ADRs are the most common drug related adverse event that occurs across the world.[7] Patients with psychiatric illness need lifelong therapy with psychotropic drugs which predisposes them to an array of ADRs.[8] In this study we analyzed the drug use pattern and common adverse effects of antipsychotic drugs. The common adverse effects were labeled and documented e.g. extra pyramidal symptoms, tremor, akathisia, sedation increased appetite, change in sex ability, mood irritability and dryness of mouth. In this study most of ADR found in metabolic adverse effect. These adverse effects tend to deteriorate the mental and physical well-being of the patient and thus lead to patient non-adherence to therapy.[9] Studies show that the psychotropic drugs most commonly associated with ADRs are antipsychotics and anti depressant.

Sedative and hypnotic drug, Anti epileptic and mood stabilizers. Among in this study most of ADR found in olanzapine and Risperidone, Clozapine, Amitriptyline and Sertraline, Quetiapine. Etizolam, Alprazolam.[10] The pharmacovigilance activities in India require to be strengthened due to the scarcity of data available related to ADRs especially with psychotropic drugs.[11] Pharmacovigilance in psychiatry can promote detection of ADRs and alert physicians regarding the probability of such events to promote patient safety there are very few reports of ADR profile of psychotropic drugs

so Pharmacovigilance program of India (PvPI) is still in infancy and ADR reporting rates is low and requires more data.[12] In India pharmacovigilance has a great potential towards safeguarding the patients. There is an immense need to strengthen these activities and develop ADRs profile of psychotropic drugs.[13] Thus, ADR monitoring helps in developing appropriate interventional strategies to manage, prevent and minimize the risk of developing ADRs and thereby reducing the cost of care.[14]

Aims and objectives

Monitoring adverse drug reaction of psychopharmacological agents; a pharmacovigilance study

Materials and methods study site: Out patients and admitted cases of Departments of Psychiatry in Chhatrapati Shivaji Subharti Hospital and Pharmacology, Subharti Medical College, Meerut. The duration of this study was approx 6 months (24 weeks).

Inclusion criteria

a. Patients men and women attending the psychiatric OPD and IPD department suffering from psychotic disorder they was include into the study.

b. All patients (old and new) who were diagnosed with psychiatric disorders as per International Classification of Diseases-ICD10 criteria4 and prescribed antidepressants, antipsychotics or mood stabilizers and benzodiazepine more common prescribe drug.

c. Patients treated with one or more psychopharmacological agents in psychiatric OPD and IPD.

Exclusion criteria

a. Patients treated with no psychopharmacological agent.

b. Patients with other psychiatric

Ethics

It is only an observational study. And the patients will be treated as per the need of patient's condition and judgement by the treating psychiatrics. The patient was diagnosed and treating by professional psychiatrics. Patient's data was recorded by investigator. Privacy of identify was maintained. Expedited review is requested. The patients was diagnosed and treated by consultants. Privacy of identity was maintained. The study was approved by the Institutional Ethics Committee of Subharti Medical College and Hospital, filed under number **SMC/IEC/2017/193.**

Procedure

Both admitted and outdoor psychiatric patient will be enrolled in the study. This is an exploratory open label study design. An adult patient of either sex was screened by the consultants. Outpatient records and other relevant documents of patients visiting psychiatric OPD and IPD Department were reviewed for ADRs and information was recorded in a suitably designed data collection form. Informed written consent was obtained from the patients. The case sheets were screened for ADRs, and those observed by the consultant and reported by the patients were also noted.

Results

Pharmacotherapy for psychiatric disorders is frequently associated with adverse drug reactions (ADRs). Different drugs may need to be tried in a patient to control the symptoms, which increases the risk of ADR.

Table1 & Graph 1 shows distribution of patients in the study. There were 50 (45%) patients from urban area and 60 (55%) from rural area. The male patients were 65 (59%) and female were 45(31%). Location of hospital near rural area could be cause of more patients from rural area. Social position of males could be cause of predominance of male patients.

Table 1 Area wise patient's distribution

Sex	Urban area	Rural area	Total patients
Male	30	35	65(59%)
Female	20	25	45 (31%)
Total	50(45%)	60(55%)	110
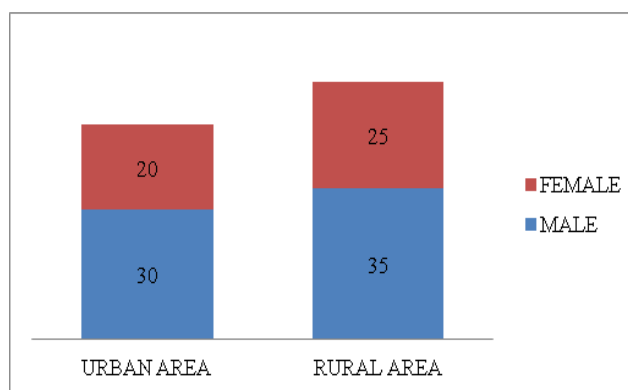
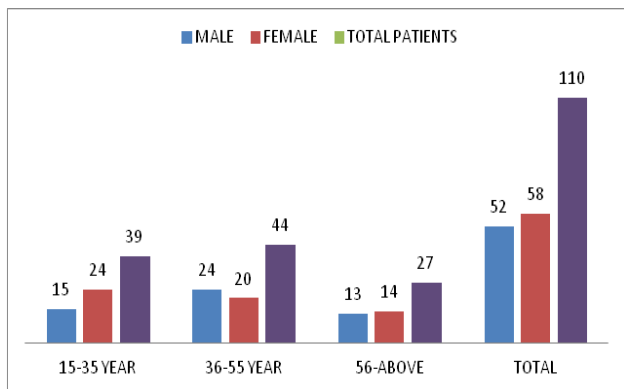**Graph 1** Area wise patient's distribution.

Table 2 & Graph 2 shows age distribution of study population. There were 35.5% in 15 year to 35 years age group, whereas 44.5% were from a higher age group. 40 % patients were in the age group from 36 years up to 55 years.24.5% was above 56 years of age. More patients from higher age group could be due to awareness in view of earlier episodes. Less number of patients in young age group could be due to onset of disease at higher age and inability to identify disease in episodes at lower age.

Table 3 & Graph 3 shows details of adverse effects in the study. These were weight gain 15.45%, change in blood glucose 18.18% and change in cholesterol 9.09% , drowsiness 4.5%, change in appetite 10.9 %, EPS 5.4%, skin problem 7.3%, irregular heart beat 6.4%, nausea and vomiting 1.8%, diarrhea 2.7%, agitation 3.6%, constipation 1.8%, each, insomnia 2.7%, sexual dysfunction 1.8 %,vision disturbance 1%, back pain 2.7%, dry mouth 4.5%,excessive sedation 6.4%,slurred speech 1.8% and others in 2.7 %.

Table 4 shows severity of adverse effects. 70(63.6%) had mild adverse effects where as 40(36.4%) had moderate adverse effects and none had severe adverse effects.38% were definitely preventable, 35% were probably preventable, and 27% were not preventable as per clinical evaluations and application of scale. In psychiatry practice as the patient is serious so initially to control the symptoms and patients condition a higher dose is given, further the drugs in psychiatry practice usually take a 2 to 6 weeks to bring clinical response, there after the dose is reduced and consequently on dose down titration many side effects are decreased as such. These adverse effects are to be seen in context of seriousness of disease itself. As in psychiatric patients untreated patients are at risk for harm to self or others, they need to be treated with drugs to protect them and the side effects are only a small discomfort in this conrtext.The risk of morbidity itself is high at a small cost of mild or moderate side effects. None of the patients had any severe adverse effect.

Table 2 Age wise patients distribution

Age	Male	Female	Total patients
15-35 Year	15	24	39(35.5%)
36-55 Year	24	20	44(40%)
56-Above	13	14	27(24.5%)
Total	52	58	110

Graph 2 Age wise patients distribution.

Table 3 Adverse drug reactions

S. No.	Adverse drug reaction	Number Of ADR	Percentage
1	Weight gain	17	15.45
2	Change in blood glucose	20	18.18
3	Change in blood cholesterol	10	9.09
4	Drowsiness	5	4.54
5	Change in appetite	12	10.9
6	Stiffness/EPS	6	5.45
7	Skin Problem	8	7.27
8	Irregular heart beet	7	6.36
9	Nausea Vomiting	2	1.81
10	Diarrhoea	3	2.72
11	Agitation	4	3.63
12	Constipation	2	1.81
13	Tremor	15	13.63
14	Palpitation	8	7.27
15	Insomnia	3	2.72
16	Change in se ability	2	1.81
17	Vision Problem	1	0.9
18	Back pain	3	2.72
19	Dry mouth	5	4.54
20	Excessive Sedation	7	6.36
21	Slurred Speech	2	1.81
22	Excessive Sweating	1	0.9
23	Akathisia	2	1.81
24	Other	3	2.72
Total	Patients 110	148	100
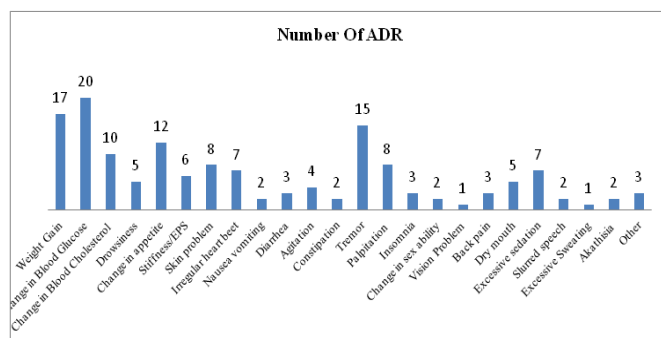
Graph 3 Patients number of adverse drug reaction.

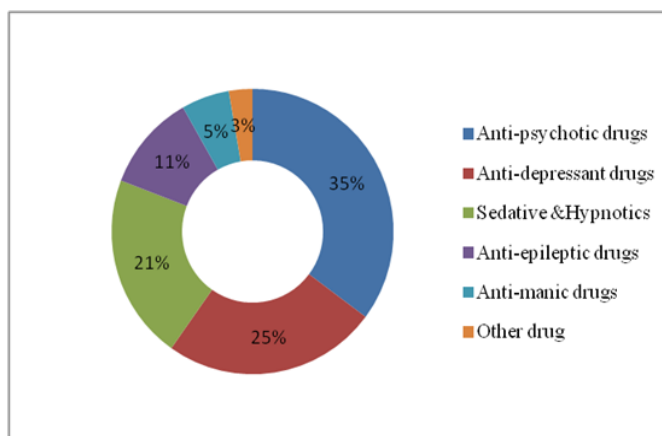**Table 4** Severity, preventability of adverse effects

Mild	Moderate	Severe	Total
70(63.6%)	40(36.4%)	0	110(100%)
Definitely preventable	Probably preventable	Not preventable	Total
38%	35%	27%	100

Table 5 & Graph 5 shows category of drugs given to the patients. Antipsychotics were given to 35. % patients, antidepressants to 24.5 %, sedatives and hypnotics were given to 20.9 %, anti epileptic to 10.9%, anti maniac drugs to 5.5% and other drugs 3.0% patients.

Table 6 & Graph 6 shows diagnosis of study population. 25.5% patients were suffering from depression, 13.63% from Bipolar disorder, 15.46% from Schizophrenia, and 10.90% from Dementia, 12.72% from Parkinson Disease, alcohol abuse, 9.09 % from phobias, 4.56 and % from 8.18 other drugs abuse

Table 5 Various groups of drugs used patients

S.no	Group of drug	Name of drug	No. of Patients
1	Anti-psychotic drugs	Olanzapine. Clozapine. Haloperidol. Risperidone. Quetiapine.Amisulpride. Aripiprazole. Chlorpromazine.	39 (35%)
2	Anti-depressant drugs	Amitriptyline.Trazodone. Mirtazapine. Sertraline. Paroxetine.	27(24.5%)
3	Sedative Hypnotics	Alprazolam. Clonazepam.	23(20.9)
4	Anti-epileptic drugs	Valporic Acid. Divalproex Sodium.	12(10.9)
5	Anti-manic drugs	Lithium	6(5.5)
6	Other drug	Methylcoblamine. Optineuore.	3(2.7)
7	Total		110

required to evaluate the pattern of ADRs among hospitalized patients in Psychiatry Department of a Chhatrapati Shivaji Subharti hospital a tertiary care hospital. Location of hospital near rural area could be cause of more patients (55%) from rural area. Social position of males could be cause of predominance of male (59%) patients. The study will reflect side effects of drugs that were predominantly used in these patients. This will have more findings about antipsychotics, antidepressants, sedatives and hypnotics that were most commonly used in the study population. Endocrinal, cardiovascular, central nervous system, autonomic system, gastrointestinal and dermatological systems' side effect were more common. Weight gain, body mass index, cholesterol profile and sugar profile disturbance were the main metabolic parameters affected. The adverse effects are to be seen in context of seriousness of disease condition of the patient. 70(63.6%) had mild adverse effects where as 40(36.4%) had moderate adverse effects and none had severe adverse effects.38% were definitely preventable, 35% were probably preventable, and 27% were not preventable as per clinical evaluations and application of scale.

Conclusion

The present study was done in CSS Subharti Hospital attached with Subharti Medical College. Data of 110 patients. With adverse effects attending outpatient and admitted in department of psychiatry department was obtained. The patient's characteristics, disease profile, drugs prescribed, outcome and adverse effects were recorded. ICD10 classification of patient's diagnosis was done. In this study we analyzed the drug use pattern and common adverse effects of antipsychotic drugs. We found most of adverse effects were labeled and documented e.g. extra pyramidal symptoms, tremor, akathisia, sedation increased appetite, change in sex ability, mood irritability and dryness of mouth. The most commonly observed adverse reactions in metabolic disorder were weight gain, increases cholesterol level, blood glucose level, blood pressure, the study results strongly suggests the need for healthcare team to focus on assessing and reporting suspected ADRs to enhance the quality of monitoring and managing ADRs.

Acknowledgments

None.

Conflicts of interest

Authors declare that there is no conflict of interest.

Graph 5 Various groups of drugs used patients.

Table 6 Diagnosis of patients

Diagnosis	ICD 10	Number (n)	Percentage (%)
depression	F30-F39	28	25.45
Bipolar disorder	F30-F39	15	13.63
Schizophrenia	F20-F29	17	15.46
Dementia	F70-F79	12	10.9
Parkinson disease	F01-F09	14	12.72
Alcholic	F10-F19	10	9.09
Phobias	F40-F48	5	4.56
Drug abuse	F10-F19	9	8.18
Total		110	100
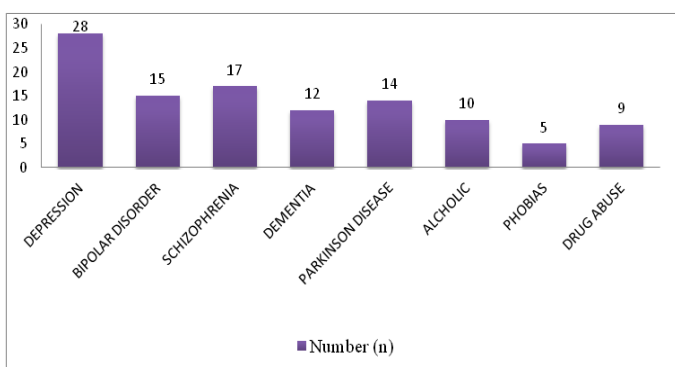
Graph 6 Diagnosis of patients.

Discussion

Pharmacotherapy for psychiatric disorders is frequently associated with adverse drug reactions (ADRs). Different drugs may need to be tried in a patient to control the symptoms, which increases the risk of ADR. Almost all the psychiatric diseases have temporary cure and the treatment is lifelong. Hence, psychiatrists need to be informed the concept of identification and reporting of potential ADRs. Pharmacovigilance in India is still in infancy and ADR reporting rates is low and requires more data. There are very few reports of ADR profile of psychotropic drugs. Hence, this pharmacovigilance study is

References

1. Park K. Mental health. In: *Parks textbook of preventive and social medicine*. 21st ed. Jabalpur: Banarsidas Bhanot; 2011. 774–775 p.

2. *World Health Report.* Geneva: World Health Organization; 2001.

3. Ravindran N. *The Silent Epidemic: 2 crore Indians need help for mental disorders*. India Toady; 2011.

4. Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet*. 2015;386(9995):743–800.

5. *Requirements for adverse reaction reporting*. Geneva, Switzerland: World Health Organization; 1975.

6. *Definition of Pharmacovigilance*. Geneva, Switzerland: World Health Organization; 2002.

7. Vrabie M, Marinescu V. Polypharmacy in bipolar disorder-a focus on drug-drug interaction. *Revista Romana de Psihiatrie*. 2011;13:128–133.

8. Jayanthi CR, Divyashree M, Sushma M. Adverse drug reactions in psychiatry outpatients: clinical spectrum, causality and avoidability. *Journal of Chemical and Pharmaceutical Research*. 2013;5(8):128–135.

9. Sarumathy S, Menaka K, Samuel Gideon George P, et al. A study on drug use pattern and adverse drug reactions of anti-psychiatric medications in a psychiatry specialized hospital. *Int J Pharm Pharm Sci*. 2014;6(6):332–334.

10. Singh HY, Mariya Y, Mamatha K, et al. Adverse drug reactions monitoring of psychotropic drugs: a tertiary care centre study. Open Journal Psychotic and Allied Science. 2017;8(2):137–138.

11. Mishra SN, Jena M, Mishra S, et al. Monitoring of adverse drug reactions in patients attending psychiatry outpatient department of a tertiary care teaching hospital. International Journal of Pharmaceutical Science and Health Care. 2014;4(2):177–184.

12. Faich GA. US adverse drug reaction surveillance 1989-1994. *Pharmacoepidemiol Drug Saf*. 1996;5(6):393–398.

13. Sengupta G, Bhowmick S, Hazra A, et al. Adverse drug reaction monitoring in psychiatry out-patient department of an Indian teaching hospital. *Indian J Pharmacol*. 2011;43(1):36–39.

14. Rajakannan T, Mallayasamy S, Guddattu V, et al. Cost of adverse drug reactions in a South Indian tertiary care teaching hospital. *J Clin Pharmacol*. 2012;52(4):559–565.