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Drug Utilization Evaluation Of Psychotropics In Elderly Patients In A Tertiary Care Hospital

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ABSTRACT: Psychotropic drugs are one of the most commonly prescribed drugs in Tertiary care. Over the past 20 years, the use of psychotropic medications has grown extensively. This prospective observational study was carried out for a period of 6 months. The study data was collected from 100 enrolled subjects who were admitted in Neurology, Cardiology, General Medicine and Psychiatry departments taking Psychotropic medications. Medication charts were reviewed and necessary data noted down. The prescribing patterns of different Psychotropic's were noted. Medication adherence in elderly was determined using MARS questionnaire. Majority of the patients who are prescribed with Psychotropic's, included in the study belonged to the age group of 65-75 (64%). In our study female population was more prescribed with Psychotropic's (55%). General Medicine and Neurology department were prescribed with more Psychotropic's. Tablets were the mostly prescribed dosage form (83.7%). Among the Psychotropic's, Clonazepam and Levetiracetam were the most prescribed ones. T. Naza and T. Oleanz were the mostly prescribed Psychotropic brands (14.7%). Commonly used category of Psychotropic is Benzodiazepines. Most commonly identified side effects were dizziness and weakness. Among 41 patients, 73.2% patients were found to be adherent using MARS questionnaire.

KEYWORDS: Psychotropic's, Elderly, Drug Utilization Evaluation, Medication Adherence Rating Scale (MARS), Drug Interactions.

I. INTRODUCTION

A Psychotropic drug is a chemical substance that changes brain function and results in alterations in perception, mood, consciousness, cognition or behaviour[1]. Psychotropics are a wide category of medications that treat many different clinical conditions. They work by adjusting levels of brain chemicals, or neurotransmitters, like dopamine, gamma amino butyric acid (GABA), nor epinephrine, and serotonin. There are five major classes of psychotropic medications:

- Antipsychotics
- Anti- anxiety agents
- Antidepressants
- Mood stabilizers
- Stimulants

Psychotropic drugs prescribed mainly in conditions like anxiety, depression, schizophrenia, bipolar disorders and sleep disorders[1]. The pathophysiology of psychiatric disorders is generally complex and they depend on particular disorder and the individual. Although the causes of most psychiatric disorders are unknown, it has been found that different biological, psychological, and environmental factors can contribute to the development or progression of psychiatric disorders[2]. Most psychiatric disorders are a result of a combination of several different factors rather than just a single factor. There are certain conditions that are identified as mental illnesses. The most common types include Anxiety Disorders, Bipolar Disorder, Depression, Alcoholic Dependence Syndrome and Schizophrenia [3].

A range of concerns and potential complications has been associated with the treatment of mental health conditions in the elderly population. These are not limited to undesired effects; advanced age often brings metabolic and functional changes that necessarily affect medication response[4]. One of the most typical complications for elderly individuals is treatment-resistant depression. Elderly people respond feebly to the first-line treatments. Despite lack of clinical evidence, physicians often prescribe a combination

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of psychotropic drug treatment for elderly patients who fail to alleviate on monotherapy. This approach to poor medication response often leads to further problems. Multiple drug treatments add stress to the body's major organs, a particular concern among the elderly[3,4]. In some instances, a false diagnosis of a mental health condition and prescription of an appropriate treatment can be just as damaging as improper prescription. In elderly patients with cognitive decline, comorbid conditions such as major illness or injury can mask underlying mood disorders. Psychotropic drugs carry drug-specific warnings about potentially dangerous side effects or drug-drug interactions, and these risks are amplified in the elderly [4,5].

As the use of multiple medications create challenges in elderly, medication adherence in older patients are often difficult. Increasing medication use with advancing age is usual to address specific symptoms, enhance or extend quality of life, or heal curable conditions. For most of the elders, underlying disease conditions require multiple drugs from different therapeutic classes, but for the rest, this polypharmacy is redundant. Reasons for non-adherence in elderly patients includes: patients assessment of risk and benefit, potential side effects, cost, regimen complexity, fear of addiction, and cognitive decline [6].

Medication adherence rating scale (MARS)

Adherence to medication is an important predictor of illness course and outcome in psychosis. The medication adherence rating scale (MARS) is a ten-item self-report measure of medication adherence in psychosis.

This scale is based on two already existing self-report measures of compliance. The first is the Drug Attitude Inventory (DAI), and the second is the Medication Adherence Questionnaire (MAQ). These compliance measures have been combined to produce a compliance scale.

The MARS consists of 10 items that requires yes/no responses. The first 4 items are based on the MAQ, and are scored, no=1 and yes=0. The remaining items are from the DAI and are coded as follows: Q5, Q6, Q9, Q10, no=1 and yes=0; Q7, Q8, no=0 and yes=1. A total score will then reflect a greater degree of compliance if it is high, and non-compliance if it is low. However one must always keep in mind that any measure of self-reported compliance will overestimate compliance by approximately 30%[7].

Q.NO	QUESTION	ANSWER
1	Do you ever forget to take your medication	Yes/no
2	Are you careless at times about taking your medication	Yes/no
3	When you feel better, do you sometimes stop taking your medication	Yes/no
4	Sometimes when you feel worse, when you take the medication, do you stop taking it	Yes/no
5	I take my medication only when I am sick	Yes/no
6	It is unnatural for my mind and body to be controlled by medication.	Yes/no
7	My thoughts are clearer on medications	Yes/no
8	By staying on, I can prevent getting sick.	Yes/no
9	I feel weird, like a zombie on medication	Yes/no
10	Medications makes me feel tired and sluggish.	Yes/no

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II. AIM & OBJECTIVE

Aim

- To assess drug utilisation pattern of Psychotropic's among elderly patients in a tertiary care hospital.

Objective

- To study the prescribing pattern of Psychotropic's.
- To identify common interactions of Psychotropic's.
- To find out possible side effects associated with Psychotropic's.
- To evaluate medication adherence behaviour of Psychotropic's in elderly using MARS questionnaire.

III. METHODOLOGY

Study design:
A prospective observational study

Study location:
Study was carried out in Neurology, General Medicine, Cardiology, and Psychiatry departments of 450 bedded tertiary care hospital.

Study duration:
Study was conducted for a period of 6 months starting from October 2019 to March 2020.

Study population:
100 patients in Neurology, General Medicine, Cardiology, and Psychiatry were included in the study.

Study tools:
1) Data Entry Form.
2) MARS questionnaire

Study criteria:

Inclusion criteria:

- Elderly patients with age greater than 65 years.
- Elderly patients prescribed with psychotropics.
- Patients who are admitted in Neurology, Cardiology, General Medicine and Psychiatry departments.

Exclusion criteria:

- Patients who are not willing to participate.
- Patients who admitted in other departments.
- Patients with age less than 65 year.
- Patients with dementia and Parkinsonism.

Study method:

1) Literature survey

A computerized literature and manual search was conducted to identify relevant studies, for the drug utilization evaluation of psychotropic drugs in General Medicine, Cardio, Neuro and Psychiatric departments. Literatures which support the study were collected and they were properly reviewed for the study.

2) Data collection:

A Data Entry Form was specially designed for collecting patient details, relevant to the study purpose. During the ward rounds, patient data including the age, sex, co morbid conditions, current diagnosis, drug therapy, lab investigations, social history, category, drug interactions were recorded in the Data Entry Form.

3) MARS questionnaire

The patients should be asked to respond to the statements in the questionnaire by circling the answer which best describes their behavior/attitude towards their medication during the treatment.

4) Evaluation of prescription

All the prescriptions for psychotropic drugs were evaluated for patient demographics and treatment details around with rationality of prescriptions.

5) Report submission:

The details about the result obtained from the study were evaluated and made as a report.

IV. RESULTS & DISCUSSION

A prescription may be taken as reflection of physician's attitude towards the disease and the role of drug in its treatment. It also provides an insight into the nature of the healthcare delivery system. The study entitled "Drug Utilization Evaluation of Psychotropic's in Elderly patients in a Tertiary Care Hospital" was a prospective prescription monitoring study carried out for a period of six months in General Medicine, Cardiology, Neurology and Psychiatry departments of a 450 bedded tertiary care hospital. The present study aimed to analyze the current prescribing pattern of psychotropic medications in elderly of above departments of a tertiary care unit. A total number of 100 patients were included in this study and their demographic data, social history, past

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medication history, medications used, dosage forms, category of drugs, number of days prescribed, concurrent medications prescribed , severity and risk category of drug interactions, medication adherence were analyzed.

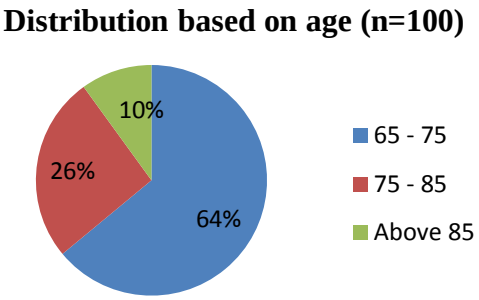

Figure 1: distribution based on age

The age group of 65-75 years (figure 1) among elderly was found to be represented with maximum Psychotropic prescription (64%), and minimum Psychotropic prescription for patients above 85 year old (10%).

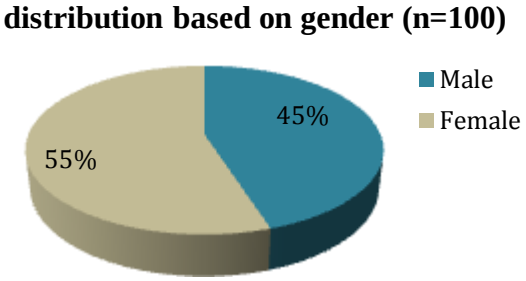

Figure 2: distribution based on gender

The demographic analysis (figure 2) suggested that females (55%) were represented with more Psychotropic drugs, compared to males (45%).

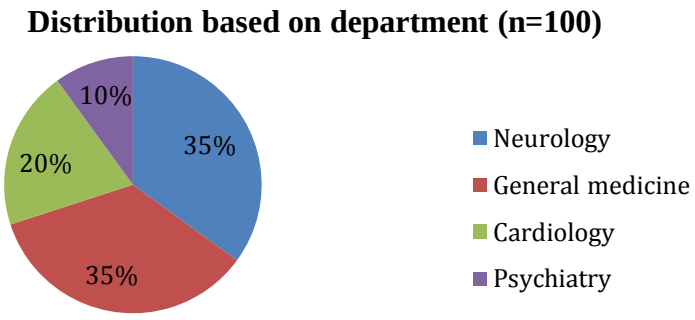

Figure 3: distribution based on admitted department

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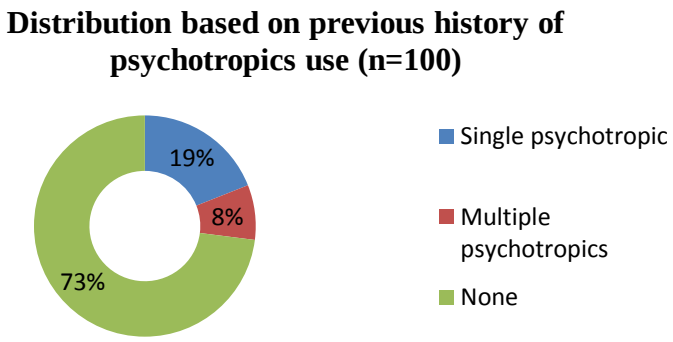

Figure 4: distribution based on previous history of psychotropic's use

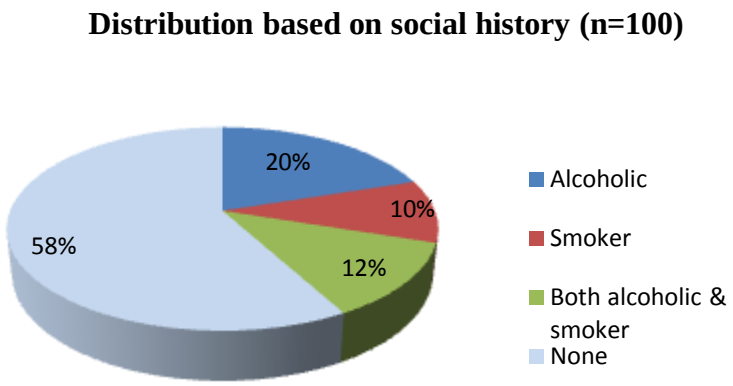

Figure 5: distribution based on social history

Here, most of the patients prescribed with Psychotropic's were admitted in both General Medicine and Neurology department (35%). 20% of patients in the study were in Cardiology and rest 10% of elderly population prescribed with Psychotropic's were admitted in Psychiatry ward (figure 3). In this study, 19% patients were previously prescribed with single psychotropic whereas, 8% of patients with multiple Psychotropic's (figure 4). 20% patients account with a social history of alcoholism whereas the proportion of smokers and none of any habits were 10% and 58% respectively. 12% of patients accounts with both alcoholism & smoking (figure 5).

Table 2: distribution based on diagnosis (n=100)

Diagnosis	Frequency	Percentage (%)
Stroke	19	19
Cardiovascular diseases	16	16
Lower respiratory tract infection	16	16
Seizure	7	7

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Subarachnoid haemorrhage	7	7
Hyponatremia	7	7
Pulmonary edema	5	5
Alcohol Dependent Syndrome	5	5
Schizophrenia	4	4
Diabetes mellitus	4	4
Gastroenteritis	3	3
Insomnia	2	2
Others	5	5

Analysis of the diagnostic pattern (table 2) suggested that stroke (19%) was the most common illness encountered, followed both cardiovascular diseases and LRTI (16%), then seizure, SAH, and hyponatremia (7%), then pulmonary edema and ADS (5%), then schizophrenia and DM (4%), gastroenteritis (3%), insomnia (2%) and 5% of other diseases. This analysis is useful to find the precipitating cause for the prescribing medication, and also to judge the rationality for such prescribing pattern.

Table 3: distribution based on psychotropic's prescribed n=100, N=172)

Psychotropic's	Frequency	Percentage (%)
Clonazepam	37	21.5
Levetiracetam	31	18.0
Olanzapine	18	10.4
Quetiapine	14	8.1
Lorazepam	11	6.3
Alprazolam	11	6.3
Fosphenytoin	8	4.6
Phenytoin	7	4.0
Clobazam	5	2.9
Risperidone	4	2.3
Zolpidem	3	1.7
Duloxetine	3	1.7
Haloperidol	3	1.7

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Pregabalin	2	1.1
Phenobarbital	2	1.1
Amisulpride	2	1.1
Gabapentin	2	1.1
Levosulpride	2	1.1
Divalproex	1	0.5
Carbamazepine	1	0.5
Midazolam	1	0.5
Nitrazepam	1	0.5
Oxicarbazepine	1	0.5
Sodium valproate	1	0.5
Trihexyphenidyl	1	0.5

From this study it is evident that, the most commonly prescribed Psychotropic drug was Clonazepam (21.5%) followed by Levetiracetam, Olanzapine, Quetiapine with a percentage of 18%, 10.4%, 8.1% respectively and the least prescribed Psychotropics include Divalproex, Carbamazepine, Midazolam, Nitrazepam, Oxicarbazepine, Sodium valproate, Trihexyphenidyl with a percentage distribution of 0.5% (table3).

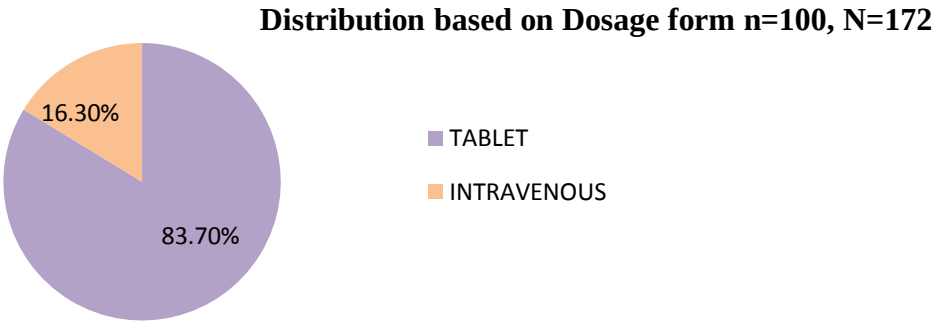

Figure 6: distribution based on dosage form

Route of administration of prescribed Psychotropic's were identified. Among 172 psychotropic drugs prescribed, 144(83.7%) were administered in the oral route as tablets and only 28 (16.3%) psychotropic drugs were administered in systemic route.

Table 4: distribution based on category of psychotropic's prescribed n=100, N=172

Category	Frequency	Percentage (%)
BZD	66	38.5
Anticonvulsants	55	31.9
Atypical antipsychotics	38	22.1

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Antidepressants	5	2.9
Hypnotics & sedatives	3	1.7
Typical antipsychotics	3	1.7
Anticholinergics	2	1.2

Here, we found that Benzodiazepines (38.5%) is the most commonly prescribed categories of Psychotropic medications, followed by Anticonvulsants (31.9%), Atypical Antipsychotics (22.1%), Antidepressants (2.9%), Hypnotics (1.7%), Typical Antipsychotics (1.7%) and Anticholinergics (1.2%) (Table 4).

Table 5: distribution based on commonly prescribed brands of psychotropic's (n=100, N=102)

Brand name	Frequency	Percentage (%)
T. Naza	15	14.7
T. Oleanz	15	14.7
T. Qutan	13	12.7
T. Clonotril	12	11.7
T. Alprax	9	8.8
Inj. Fusolin	8	7.8
Inj. Epilive	7	6.8
T. Epilive	7	6.8
T. Zapiz	7	6.8
T. Eptoin	5	4.9
T. Ativan	4	3.9

Among the different brands of Psychotropic's prescribed (table 5) in various departments, the most commonly used brands were T. Naza & T. Oleanz (14.7%) followed by T. Qutan (12.7%), T. Clonotril (11.7%), T. Alprax (8.8%), Inj. Fusolin (7.8%), Inj. Epilive (6.8%), T. Epilive (6.8%), T. Zapiz (6.8%), T. Eptoin (4.9%), T. Ativan (3.9%).

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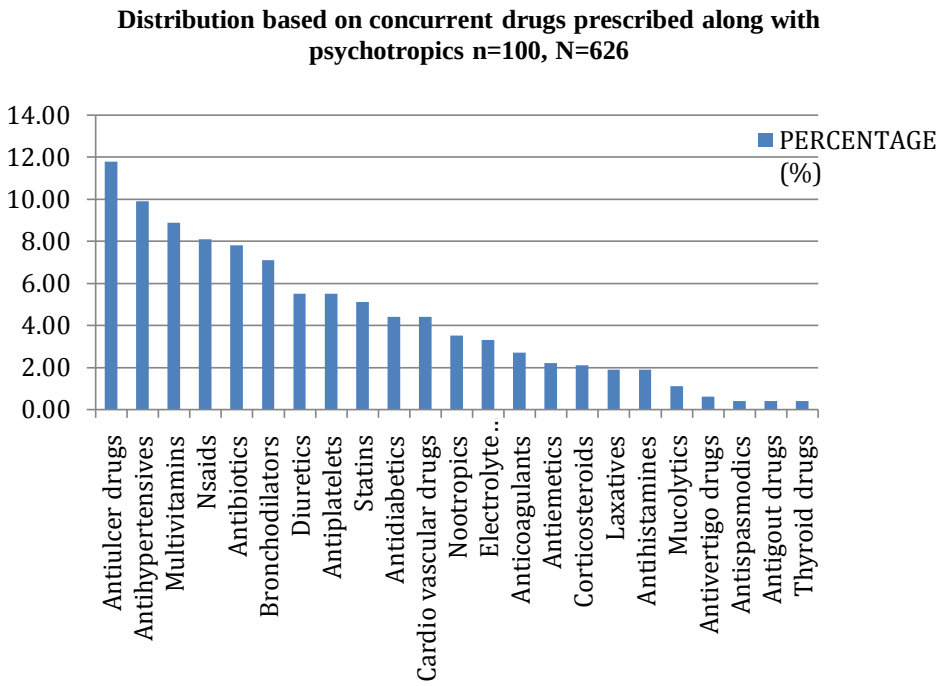

Figure 7: distribution based on concurrent drugs prescribed

According to this study, along with Psychotropic's most commonly prescribed drugs (figure 7) were Antiulcer drugs (11.8%) followed by Antihy pertensives (9.9%), multivitamins (8.9%), NSAIDs (8.1%)etc.. and the least prescribed drugs were Antispasmodics, Antigout agents and Antithyroid drugs (0.4%).

Polypharmacy can lead to poor compliance, drug interaction, and adverse drug reactions, underuse of effective treatments, healthcare costs, and medication errors. Average number of drugs per prescription is an important index of prescription audit. It is preferable to keep the mean number of drugs per prescription as low as possible because multiple drugs lead to increased risk of drug interaction.

Table 6: distribution based on drug interactions with psychotropic's identified using medscape (n=100, N=98)

Severity	Frequency	Percentage (%)
Major	6	6.1
Moderate	82	83.7
Minor	10	10.2

Table 7: distribution based on major interactions (n=100, N=6)

Major interaction	frequency	Percentage (%)
Fosphenytoin +Ttolvaptan	2	33.3
Duloxetine + Omeprazole	2	33.3
Duloxetine + Ondansetron	1	16.6
Phenytoin + Tolvaptan	1	16.6

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In this study of 100 prescriptions, 98 number of potential DDIs with Psychotropic's were identified using Medscape online database (table 6). Among this there were a total of 6 major, 82 moderate and 10 minor interactions.

Table 8: distribution based on drug interactions with psychotropic's identified using lexicomp (n=100, N=103)

Risk category	Action	Frequency	Percentage (%)
A	No known interactions	0	0
B	No action needed	6	5.8
C	Monitor therapy	74	71.8
D	Consider therapy modification	20	19.4
X	Avoid combination	3	2.9

Table 9: distribution based drug groups involved in interactions with psychotropic's n=100, N=81)

Drug groups	Frequency	Percentage (%)
Methyl xanthines	15	18.5
PPIs	12	14.8
Antihypertensives	9	11.1
Antiplatelets	8	9.8
Corticosteroids	8	9.8
Antidiabetics	6	7.4
NSAIDs	6	7.4
Antihistamines	5	6.1
Statins	2	2.4
Vassopressin r2 antagonist	2	2.4
Antiemetics	2	2.4
Multivitamins	2	2.4
Beta 2 agonist	1	1.2
Antibiotic	1	1.2
Electrolyte replenisher	1	1.2
Thyroid drugs	1	1.2

According to the risk rating scale of Lexicomp online database 103 interactions were analyzed. Among this, there were 74 interactions in category C, followed by 20 interactions in category D, 6 interactions in category B and 3 interactions in category D (table 8.) The drugs that involve in major DDIs were Tolvaptan, Ondansetron and Omeprazole (table 7). The drug groups that frequently involved in major & moderate interactions (table 9) were Methylxanthines (18.5%), followed by, PPIs (14.8%), Antihypertensives (11.1%) Antiplatelets and

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Corticosteroids (9.8%), Antidiabetics and NSAIDs (7.4%), Antihistamines (6.1%), Statins, Vasopressin receptor 2 antagonist, Antiemetics, Multivitamins (2.4%), and Beta 2 agonist, Antibiotics, Electrolyte replenisher, Antithyroid drugs (1.2%).

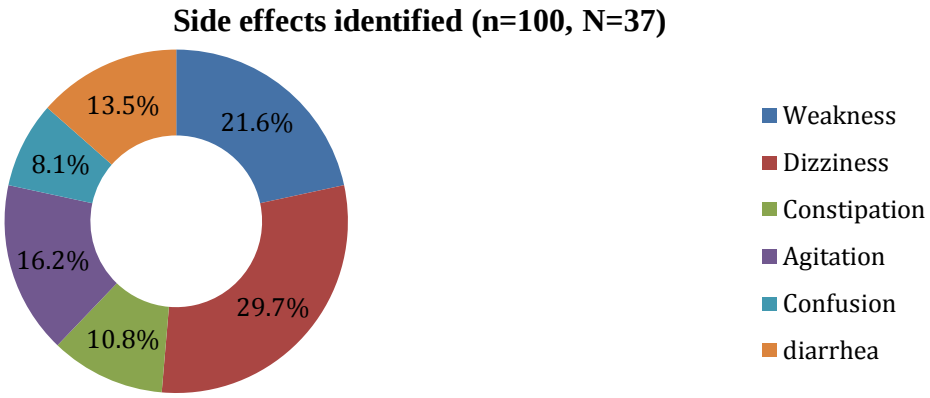

Figure 8: distribution based on side effects identified

From this study out of 100, 37 patients were identified with side effects (figure 8). Most common side effects were dizziness and weakness with a percentage of 29.7% and 21.6% respectively, followed by agitation (16.2%), diarrhea (13.5%), constipation (10.8%), and confusion (8.1%).

Table 10: distribution of psychotropic's based on side effects observed

Side Effects	Drugs
Weakness	Gabapentin, Sodium valproate, Levetiracetam
Dizziness	Zolpidem, Clonazepam, Levetiracetam, Lorazepam.
Constipation	Lorazepam, Clobazam
Agitation	Resperidone, Duloxetine.
Confusion	Phenytoin, Phenobarbital.
Diarrhoea	Quetiapine, Olanzapine.

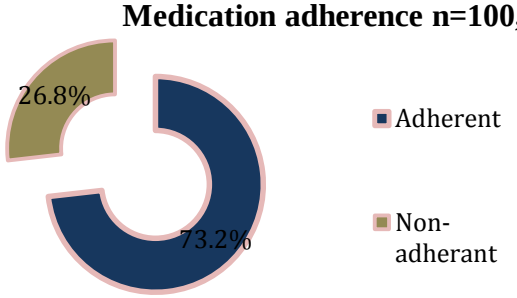

Figure 9: distribution based on medication adherence

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Using MARS questionnaire medication adherence of 41 patients was studied. Among them, 73.2% of patients were adherent to the treatment.

V. CONCLUSION

The study entitled "Drug utilization evaluation of psychotropic drugs in elderly in a tertiary care hospital" was a prospective observational study carried out for a period of six months in Neurology, General Medicine, Cardiology and Psychiatry departments of a 450 bedded tertiary care hospital.

From the drug utilization evaluation it was found that most of the elderly population was prescribed with psychotropics along with other medications. Psychotropic's of tablet dosage form was used more than any other dosage forms. Benzodiazepines were the most commonly prescribed category of psychotropics by physicians. Our study identified that drug use in elderly is inappropriate and special emphasis must be provided for rationalizing the drug use in this population.

The study also concluded the evidence of alcoholism and smoking history tends towards the major risk of developing other comorbid conditions to psychiatric illness. This study also found out the clinical importance of drug interactions with psychotropic drugs and the patients who are at risk of serious interactions and side effects.The study provides a baseline data for carrying out further studies on prescribing pattern in a tertiary care unit, which would provide information for improving the utilization of psychotropic drugs in health facilities.

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