A Prospective Observational Study on Assessment of Prescription Pattern among Patients Suffering from Epilepsy

Kanchana Dussa[1*], Ayesha Mahek Raja[2], Mohammed Ziauddin[3]

[1*]*Professor & Head, Department of Pharmacy Practice, Anwarul Uloom College of Pharmacy, Hyderabad, India.*

[2]*Pharm.D Sixth Year, Anwarul Uloom College of Pharmacy, Hyderabad, India.*

[3]*Clinical Pharmacologist & Head, Apollo Hospitals, Film Nagar, Jubilee Hills, Hyderabad, India.*

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ABSTRACT

This present study aim was to assess prescription pattern among patients with epilepsy. This present study was carried out in the neurological outpatient department at Apollo Hospital, Hyderabad. WHO indicators of prescriptions were utilized for assessing prescription pattern. Drug-drug interaction (DDI) was assessed by using Clinirex. In this present study, 47 patients suffering from epilepsy were included. Data was collected and documented in the data collection form. Out of 47 patients, majority 63.83% patients were female. The majority 46.81% patients were prescribed two anti-epileptic drugs (AED) and 31.91% patients were prescribed with single AED. Out of 46.81% most commonly 4.26% patients each were prescribed two AED such as Levera combination with Lacosam, Oxetol XR in combination with Lacosam, and Levipil in combination with Valprol CR. A total of 23 DDI were identified however majority 22 DDI were from the monitor category of DDI. All drugs prescribed were oral dosage form and with brand names. Injections were not prescribed. The average number of drugs prescribed was 2.57 drugs. It can be concluded that pharmacists need to be involved along with neurologists to identify DDI and in turn prevent or reduce adverse drug reactions and promote rational treatment.

INTRODUCTION:

Epilepsy is defined as frequent seizures due to a chronic, underlying process. A paroxysmal incident due to abnormal disproportionate or synchronic neural activity in the brain is referred to as a seizure. The occurrence of epilepsy around the world in different populations is approximately 0.3 to 0.5% and the incidence is estimated at 5 to 30 persons per 1000. Almost 80% of the patients suffering from epilepsy belong to poor and developing countries. In India, the incidence of epilepsy was reported as 5.59 to 10 per 1000. Various Longitudinal studies conducted including heterogeneous urban Indian population showed an age-standardized incidence rate of 27.3 per 100,000 per year.

Recurrent or stubborn seizures usually lead to poor quality of life in patients suffering from epilepsy. Furthermore, epilepsy causes a significant financial load on the patients and their families. The goal of treatment of epilepsy is to achieve freedom from seizures to lead a normal life and to achieve minimum adverse effects of treatment on mental, physical, and financial areas.

The United States Food and Drug Administration (US FDA) has approved 24 AEDs. Even though there is a wide range of choices in AEDS for treatment, the challenging problem is in choosing the best AED for individual patients. Reports state that it is possible to control seizures in 80% of epilepsy patients by using one drug, this can reduce the risk of significant adverse effects and drug interactions as both of these increase with prescribing of more than one drug. Usually, for refractory epilepsy, AED polytherapy (2 or more drug combinations) is reserved. However, when a patient suffering from refractory epilepsy requires such type of therapy, then the lowest drug load with minimum numbers and low doses should be utilized. Even though there is no evidential proof for the existence of specific AED polytherapy, the monotherapy needs to be augmented with a greater number of AED with different or complementary mechanisms of action may be considered. It can be difficult to choose an optimal polytherapy due to many reasons, the major cause can be the limited data about favourable or unfavourable combinations. Hence, at the time of prescribing polytherapy a profound thought should always be given (Ngangom Gunindro *et al.* 2018).

In different parts of India, many researchers have conducted studies addressing the prescription patterns and utilization of AEDS. The scarcity of such studies in Hyderabad was noticed thus this present study was conducted. The aim was to assess the prescription pattern in patients with epilepsy.

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Ethical approval: Ethical approval was acquired before the commencement of the study from the Institutional Ethics Committee- Biomedical Research Apollo Hospitals, Hyderabad. The approval reference number is AHJ-ACD-080/10-21. The date of approval was 29/10/2021.

METHOD:

Prospective observational study was conducted at the Neurology outpatient department, Apollo Hospital, Film Nagar, Jubilee Hills, Hyderabad. The study was carried out from October 2021 to April 2022.

Inclusion criteria: Patients suffering from epilepsy, patients of age group equal to or more than 18 and equal to or less than 75 years, patients willing to provide consent and patients visiting the outpatient department of neurology. Only the patients fulfilling above inclusion criteria were included in the study. Patients were informed that data confidentiality will be maintained. Exclusion criteria: Patients who were not willing to participate, patients in critical health and patients of age less than 18 years and more than 75 years were excluded from this study. Patients willing to participate were provided with patient information leaflet about the study. The participants were explained about their freedom to quit the study at any stage of study. Data was collected from prescriptions of these patients. All the data was collected and documented in a specially designed data collection form. It comprised of demographic profile details of patients. After the collection of the data, it was entered into a Microsoft Excel 2016 Spreadsheet. A descriptive statistical analysis was carried out.

WHO indicators were used to evaluate and assess prescription patterns (Ayesha Mahek Raja et al. 2023). Categorization of diagnosis of disease was carried out based on WHO's ICD11 criteria (https://icd.who.int/en,accessed on 07/05/2022). Drug-drug interactions were assessed using Clinirex (https://www.clinirex.com/Interactions). The definition of non-polypharmacy considered for this present study was prescriptions with three or fewer drugs at a time (Sharma V. et al. 2017).

Limitations of the Study:

Out-patient prescriptions were included in this study thus complete details about the patient could not be collected. Thus, rationality of prescriptions for optimal treatment with AEDs could not be assessed. This was a limitation of this study.

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RESULTS AND DISCUSSION:

Age-wise distribution:

Table 1: Age-wise distribution:

S. No.	Age in years	Number (N)	Percentage (%)
1	18-25	14	29.79
2	26-35	11	23.40
3	36-45	5	10.64
4	46-55	8	17.02
5	56-65	5	10.64
6	66-75	4	8.51
	Total	47	100.00

Age-wise distribution is shown in Table 1. This present study results of age category were similar to the result of Rupa Joshi *et al.* (Rupa Joshi *et al.*2020).

Gender-wise distribution:

Table 2: Gender-wise distribution:

S. No.	Gender	Number (N)	Percentage (%)
1	Male	17	36.17
2	Female	30	63.83
	Total	47	100.00

In this present study, majority 63.83% of patients suffering from epilepsy were female, this was contrary to the results of Ngangom Gunindro *et al.* (Ngangom Gunindro *et al.* 2018).

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Polypharmacy status:

Table 3: Polypharmacy status:

S. No.	No. of medicines per prescription	Number (N)	Percentage (%)
1	1	4	8.51
2	2	23	48.94
3	3	12	25.53
4	4	5	10.64
5	5	3	6.38
	Total	47	100.00

In this present study majority 82.98% of the patients were prescribed with 3 or less than 3 drugs (non-polypharmacy) and polypharmacy was noticed in only 17.02% of prescriptions. This present study results were contrary to Sharma V. et al. (Sharma V. et al. 2017).

Risk factor status:

Table 4: Risk factors in epilepsy patients:

S. No.	Risk factors	Number (N)	Percentage (%)
1	Hypertension	3	6.38
2	Hypertension and type 2 Diabetes mellitus	1	2.13
3	Hypothyroidism	1	2.13
4	Total risk factors	5	10.64
5	No risk factor	42	89.36
	Total	47	100.00

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Assessment of prescribing indicators as per WHO:

Table 5: Assessment of prescribing indicators as per WHO:

S. No.	Prescribing indicators as per WHO	WHO standard value	Observed Value
1	Average number of drugs per prescription	1.6-1.8	2.57
2	Percentage of drugs prescribed by generic name	100	0
3	Percentage of encounters with an antibiotic prescribed	20.0-26.8	0
4	Percentage of encounters with an injection prescribed	13.4-24.1	0
5	Percentage of drugs prescribed from WHO model list of essential medicines	100	0

All the drugs were prescribed with brand names. Medicines were not prescribed from WHO list of essential medicines (Ayesha Mahek Raja et al. 2023).

AED prescribed status:

Table 6: AED prescribed status:

S. No.	Number of AED prescribed	Number (N)	Percentage (%)
1	Single AED prescribed	15	31.91
2	Two AEDs combination	20	46.81
3	Three AEDs combination	6	8.51
4	Four AEDs combination	1	2.13
5	No neurological drugs	5	10.64
	Total	47	100.00

This present study results of AED prescribed status were almost similar to results of Ngangom Gunindro *et al.* and Rupa Joshi *et al.* (Ngangom Gunindro *et al.* 2018, Rupa Joshi

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*et al.*2020). As per USFDA it might not be rational, as prescribing of more than one drug can increase the risk of adverse effects and drug interactions (Ngangom Gunindro *et al.* 2018).

Single AEDs prescription status:

Table 7: Single AEDs prescription status:

S. No.	Drugs	Generic name	Number (N)	Percentage (%)
1	Britzilam	Brivaracetam	2	4.26
2	Levera	Levetiracetam	2	4.26
3	Levipil	Levetiracetam	5	10.64
4	Oxetol	Oxcarbazepine	2	4.26
5	Topaz	Topiramate	1	2.13
6	Torleva	Levetiracetam	2	4.26
7	Zenoxa	Oxcarbazepine	1	2.13
	Total		15	31.91

Two AEDs combination prescription status:

Table 8: Two AEDs combination prescription status:

S. No.	Drugs	Generic name	Number (N)	Percentage (%)
1	Levera+Divaa OD	Levetiracetam+Divalproex	1	2.13
2	Levipil+Gabapin NT	Levetiracetam+Gabapentin+Nortriptyline	1	2.13
3	Encorate Chrono	Sodium Valproate+Valproic Acid	1	2.13
4	Valparin Chrono	Sodium Valproate+Valproic Acid	1	2.13
5	Divaa+Rivotril	Divalproex+Clonazepam	1	2.13
6	Britzilam+Diva	Brivaracetam+Divalproex	1	2.13
7	Eptoin+Trigabantin	Phenytoin+Gabapentin	1	2.13
8	Eptoin+Levipil	Phenytoin+Levetiracetam	1	2.13
9	Levera+Lacosam	Levetiracetam+Lacosamide	2	4.26
10	Lamitor+Oxetol	Lamotrigine+Oxcarbazepine	1	2.13
11	Levera+Topaz	Levetiracetam+Topiramate	1	2.13
12	Levera+Diva	Levetiracetam+Divalproex	1	2.13
13	Levera+Zenoxa	Levetiracetam+Oxcarbazepine	1	2.13
14	Levipil+Topamac	Levetiracetam+Topiramate	1	2.13
15	Levipil+Oxetol XR	Levetiracetam+Oxcarbazepine	1	2.13
16	Levipil+Valprol CR	Levetiracetam+Sodium Valproate	2	4.26
17	Oxetol+Britzilam	Oxcarbazepine+Brivaracetam	1	2.13
18	Oxetol XR+Lacosam	Oxcarbazepine+Lacosamide	2	4.26
19	Valprol CR+brevipil	Sodium Valproate+Brivaracetam	1	2.13
	Total		22	46.81

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Three AEDs combination prescription status:

Table 9: Three AEDs combination prescription status:

S. No.	Drugs	Generic name	Number (N)	Percentage (%)
1	Torleva+Epilex Chrono	Levetiracetam+Sodium Valproate+Valproic Acid	1	2.13
2	Lacosam+Zenoxa+Frisium	Lacosamide+Oxcarbazepine+Clobazam	1	2.13
3	Britzilam+Oxetol XR+Frisium	Brivaracetam+Oxcarbazepine+Clobazam	1	2.13
4	Levera+Zenoxa+Lobazam	Levetiracetam+Oxcarbazepine+Clobazam	1	2.13
	Total		4	8.51

Four AEDs combination prescription status:

Table 10: Four AEDs combination prescription status:

S. No.	Drugs	Generic name	Number (N)	Percentage (%)
1	Valparin Chrono+Britzilam+Frisium	Sodium Valproate+Valproic Acid+Brivaracetam+Clobazam	1	2.13
	Total		1	2.13

Drug-drug interaction category:

Table 11: Drug-drug interaction category:

S. No.	Drug-drug interaction category	Number (N)	Percentage (%)
1	Generally, avoid	1	4.35
2	Monitor	22	95.65
	Total	23	100.00

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Monitor drug-drug interaction category:

Table 12: Monitor drug-drug interaction category:

S. No.	Drug-drug interaction	Number (N)
1	Aspirin+ Cilostazol	1
2	Aspirin+ Clopidogrel	2
3	Atorvastatin+ Clopidogrel	5
4	Baclofen+ Levetiracetam	1
5	Baclofen+ Phenytoin	1
6	Cilostazol+ Clopidogrel	1
7	Clobazam+ Brivaracetam	1
8	Gabapentin+ Nortriptyline	1
9	Levetiracetam+ Clobazam	1
10	Levetiracetam+ Nortriptyline	1
11	Levetiracetam+ Oxcarbazepine	1
12	Levetiracetam+ Oxcarbazepine	1
13	Oxcarbazepine+ Brivaracetam	3
14	Oxcarbazepine+ Levetiracetam	1
15	Trihexyphenidyl+ Tetrabenazine	1
	Total	22

Generally, avoid drug-drug interaction category:

Table 13: Generally, avoid drug-drug interaction category:

S. No.	Drug-drug interaction	Number (N)
1	Naproxen+ Esomeprazole	1
	Total	1

CONCLUSION

It can be concluded from this study that the majority of the patients were prescribed with two AED and twenty-three DDI's were noticed. Pharmacists can play a crucial role when they are

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involved along with neurologists in outpatient department to identify drug-drug interactions and in turn prevent or reduce adverse drug reactions and promote rational drug use.

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Conflicts of interest

There were no conflicts of in this present study.

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Image **Author -1**	Author Name – Corresponding Author: Kanchana Dussa Author Affiliation: Professor and Head Author Address/Institute Address: Anwarul Uloom College of Pharmacy, New Mallepally, Hyderabad
Image **Author -2**	Author Name: Ayesha Mahek Raja Author Affiliation: Pharm. D 6th Year Intern Author Address/Institute Address: Anwarul Uloom College of Pharmacy, New Mallepally, Hyderabad
Image **Author -3**	Author Name: Mohammed Ziauddin Author Affiliation: Clinical Pharmacologist and Head Author Address/Institute Address: Apollo Hospitals, Film Nagar, Jubilee Hills, Hyderabad. India.

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