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Original Research Article

To Analyse the Prescription Trend of Anti-Epileptic Drugs: An Observational Study

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Abstract

Aim: To analyze the prescription trend of anti-epileptic drugs at a tertiary care center in Bihar region.

Materials and Methods: The observational study at Department of Pharmacology, Netaji Subhas medical College and Hospital, Bihta, Patna, Bihar, India. Prescription patterns were examined for epilepsy-diagnosed adult outpatients. Over 3 months, 100 prescriptions were randomly gathered. Patient demographics, clinical diagnosis, epilepsy type, AED type, medication dosage, and frequency will be noted. We determined the average prescription medication count.

Results: Epilepsy types: 79% of prescriptions were for GTCS, 11% for partial, 4% for myoclonic, 5% for secondary, and 1% for absence. Comparison of mono and polytherapy: Out of 100 patients, 67% underwent monotherapy with diverse medicines. In 33% of patients, two or more medicines were combined. Phenobarbitone (28%) was the most often administered AED in monotherapy (67 patients), followed by phenytoin (16%), levetiracetam (12%), carbamazepine (8%), lorazepam (2%) and ethosuximide (1%). Phenobarbitone and phenytoin were the most frequent two-drug combinations, while phenobarbitone, phenytoin, and carbamazepine were the most common three- Adverse events: 19 of 100 AED users reported side effects. Sedation, headache, and dizziness were the most prevalent CNS side effects (9). 4 individuals on phenytoin had gingival hyperplasia. Four patients had gastrointestinal issues. One patient gained weight.

Conclusion: Most patients chose monotherapy with phenytoin and phenobarbitone for GTCS, the most frequent epilepsy. New antiepileptics included levetiracetam and topiramate. AED prescriptions in India are inconsistent and unreliable due to the lack of guidelines. Our investigation found that prescription pattern matches existing trends.

Keywords: Epilepsy, Anti-Epileptic Drug (AED), Monotherapy, Combined therapy, Prescribing pattern

Introduction

Epilepsy, a neurological illness causing spontaneous seizures, affects millions worldwide. The majority of epilepsy treatment uses anti-epileptic drugs (AEMs) to control seizures and enhance quality of life. Over time, AEMs have been developed and refined to improve effectiveness, adverse effects, and patient adherence. Recent advances, problems, and future perspectives in anti-epileptic drugs are discussed in this introduction. First introduced in the mid-19th century, bromides were followed by phenobarbital in 1912 and phenytoin in 1938. These early medications lay the groundwork for contemporary epilepsy therapy but had serious side effects and varied success. Later in the 20th century, valproate and carbamazepine enhanced seizure control and tolerability. Second- and third-generation medications like lamotrigine, levetiracetam, and topiramate revolutionised AEMs by expanding physicians' therapy choices. [1] AEMs reduce neuronal excitability and prevent aberrant brain electrical activity via multiple ways. [1,2] These processes include ion channel modulation, inhibitory neurotransmission augmentation, and excitatory neurotransmission attenuation. Phenytoin and carbamazepine block voltage-gated sodium channels to stabilise neuronal membranes, whereas benzodiazepines and barbiturates increase GABA inhibition. Optimising treatment regimens and

creating new drugs requires understanding these pathways. [2] AEM development has advanced in effectiveness, safety, and patient-specific treatment in recent years. High-affinity synaptic vesicle protein 2A ligand brivaracetam may regulate focal seizures with safe side effects. [3] Cannabidiol (CBD), a non-psychoactive cannabis component, has been licensed to treat severe epileptic disorders including Dravet and Lennox-Gastaut, advancing epilepsy therapy. [4] Cenobamate has shown promise in treating focal seizures in individuals who have failed earlier therapies. Cenobamate's powerful anti-seizure actions come from its dual method of regulating GABA-A receptors and blocking voltage-gated sodium channels. [5] Epilepsy treatment remains difficult despite many AEMs. One-third of epilepsy patients cannot manage their seizures with existing treatments due to drug resistance. [6] Drug-resistant epilepsy has complex, multiple causes that need constant study to discover new treatments. Adverse effects of AEMs can present concerns. Side symptoms include dizziness, weariness, and cognitive impairment might affect patient adherence and quality of life. Hepatotoxicity, haematologic abnormalities, and teratogenicity necessitate close monitoring and treatment. [7-14] AEM effectiveness and safety must be balanced in epilepsy therapy.

Materials and Methods

The observational study at Department of Pharmacology, Netaji Subhas medical College and Hospital,Bihta,Patna,Bihar, India .The prescription trend of adult outpatients who have been diagnosed with epilepsy was investigated, and the individuals were identified. Inclusion Criteria

- More than 15 years of age.
- Both sex, male and female.
- Idiopathic epilepsy.

Exclusion Criteria

- Pregnant and lactating woman

Methodology

Over the course of three months, a total of one hundred prescriptions were gathered in a random fashion. This study will record the demographic information of patients, as well as their clinical diagnosis, type of epilepsy, kind of AED taken, medication dosage, and frequency of usage. It was determined how many drugs were purchased on average for each prescription. A proforma that had been prepared beforehand was used to record the prescriptions.

Statistical Analysis

A descriptive statistical analysis was applied in the present study using SPSS version 22.

Results

The research included 100 patients, 62 of them were male and 38 female. Epilepsy was most frequent among 20-40-year-olds. (Table 1) 56% of patients were educated and 58% worked (Table 2). Family history of epilepsy was found in 28% of cases. Table 3 Types of epilepsy: The prescriptions showed 79% GTCS, 11% partial seizure, 4% myoclonic seizure, 5% secondary seizures, and 1% absence seizures. Comparison of mono and polytherapy: Out of 100 patients, 67% underwent monotherapy with diverse medicines. In 33% of patients, two or more medicines were combined. Phenobarbitone (28%) was the most often administered AED in monotherapy (67 patients), followed by phenytoin (16%), levetiracetam (12%), carbamazepine (8%), lorazepam (2%) and ethosuximide (1%). Phenobarbitone and phenytoin were the most frequent two-drug combinations, while phenobarbitone, phenytoin, and carbamazepine were the most common three- Adverse events: 19 of 100 AED users reported side effects. Sedation, headache, and dizziness were the most prevalent CNS side effects (9). 4 individuals on phenytoin had gingival hyperplasia. Four patients had gastrointestinal issues. One patient gained weight. Table 3

Table 1: Age and Sex wise distribution

Age	Male	Female	Total
10-20 Yrs	11	5	16
20-40 Yrs	27	15	52
>40	24	18	32
Total	62	38	100

Table 2: Educational and Employment status

Educated	56
Uneducated	44
Employed	58
Unemployed	42

Table 3: Family history

Family History	**Present**	**Absent**
	28	72

Adverse events	**No. of patients**
CNS related	9
Gastrointestinal disturbance	5
Gingival hyperplasia	4
Weight gain	1

Discussion

Prescription pattern studies assist the healthcare system analyse, interpret, and optimise medicine prescription, administration, and usage to promote rational drug use. Patient files and computer registries are commonly utilised for pharmacological data collection. [15] Chronic epilepsy affects physical, psychological, and economical quality of life. A comprehensive diagnosis, optimum therapy, and personalised counselling are essential. [16] Treatment aims to stop seizures without unwanted effects. Efficacy, toxicity, and simplicity of use should be considered for each patient when choosing a medicine. [16] This research examined 100 epilepsy medications. Sociodemographic data showed that 62% of patients were male and 38% female (Table 1). Our analysis shows a male predominance, which is consistent with Asian studies. [17]

The majority of patients in this research were 20-40 years old (52%), followed by >40 (32%), and 10-20 (16%). Bimodal distribution of epilepsy incidence. Peak incidence in first decade, then elderly. [18] Most Indians are young, thus our research may have missed peak senior patients. [19] 28% of patients have epilepsy in their families. This study found GTCS (79%) to be the most common type of epilepsy, similar to Shachidanad Pathak et al. [20] Then partial (11%), secondary (5%), myoclonic (4%), and absence seizures (1%). Monotherapy is preferred to reduce adverse drug reactions, dose-related toxicity, drug interactions, noncompliance, and cost. [21]

Our study found that most patients received monotherapy, as in other studies. [22] Monotherapy was 67% and combination treatment 33%. Our study found that phenobarbitone (28%) and phenytoin (16%) were the most commonly prescribed monotherapies. The government provided these two medications for free. Other medicines include levetiracetam (12%), carbamazepine (8%), lorazepam (2%) and ethosuximide (1%). Polytherapy has several drawbacks like noncompliance, higher frequency of side effects and also quality of life would be compromised yet it is inevitable in small group of patients who are not responding to monotherapy. [23,24] In combination treatment, most generally utilised two medication combination was phenobarbitone with phenytoin (23%) since both pharmaceuticals are of cheap cost and readily accessible, followed by three drug combination with phenobarbitone, phenytoin and carbamazepine (6%). This study used newer AEDs Levetiracetam and Topiramate. Newer AED were not often given owing to increased cost and un availablity in government supply, since they are still not listed in Essential Drug List. [20] Adverse effects to antiepileptic medicines were found in 19 individuals, most of them were connected to CNS that included drowsiness, head discomfort and dizziness. Four phenytoin users had gingival hyperplasia.

Conclusion

Our tertiary care hospital epilepsy prescription research found a male prevalence with most patients aged 20-40. Most patients chose monotherapy with phenytoin and phenobarbitone for GTCS, the most frequent epilepsy. New antiepileptics included levetiracetam and topiramate. AED prescriptions in India are inconsistent and unreliable due to the lack of guidelines. Our investigation found that prescription pattern matches existing trends.

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