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A Study on Prescribing Patter of Anti-Epileptic Drugs in a Tertiary Care Hospital

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A B S T R A C T

Epilepsy is an ancient disorder and has been described historically from the times of the ancient Babylonians to the modern day. Although epilepsy is characterized by seizures that are unpredictable in frequency, epilepsy is a common neurological disorder that affects people of all ages. The prospective observational study was carried out for a period of 6 months. The study was conducted in Pediatrics department in a tertiary care hospital. The present study aimed to assess prescribing patter of anti-epileptic drugs in a tertiary care hospital. Combination of two AEDs patients were more 49 (75.38%) as compared to Monotherapy patients were 16 (24.61 %). ECG patients were more 29 (44.61%) as compared to CT scan patients were 14 (21.53%), Blood test patients were 22(33.84%). Carbamazepine prescribed drugs patients were more 15(23.07%) as compared to Phenobarbital prescribed drugs patients were 10(15.38%), Phenytoin prescribed drugs patients were 14(21.53Sodium valproate prescribed drugs patients were 14(21.53%), Levetiracetam prescribed drugs patients were 12(18.46%). Newer drugs have been increasingly added to the list of antiepileptic drugs, but most of them serve as adjuvant to older ones and the important drugs used as monotherapy are still the older ones. The present study highlights the pattern of the use of older and newer AEDs resulting in good seizure control in different types of epilepsy. Prescription patterns are consistent with existing evidences regarding the continuum of efficacy of individual newer and older AEDs in different seizure types.

Keywords: Epilepsy, Neurological disorder, continuum of efficacy, seizure control

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Contents

1. Introduction

Epilepsy is an ancient disorder and has been described historically from the times of the ancient Babylonians to the modern day. Although epilepsy is characterized by seizures that are unpredictable in frequency, epilepsy is a common neurological disorder that affects people of all ages. Indeed, epilepsy has a bimodal onset that occurs most often in childhood and older adulthood. However, it is also a spectrum of disorders with a range of severities, widely differing seizure types and causes, and varying impacts on individuals and their families. Beyond actually living with epilepsy and its seizures and coexisting health conditions, the challenges that face millions of people living with epilepsy include having access to high-quality healthcare, learning about and coordinating healthcare, medication, vocational, independent living, and other community services, and dealing with stigma and common public misunderstandings. The current study pooled over 124 million persons and over 655,000 persons with epilepsy, and used meta-regression to statistically examine the effect

of many sources of heterogeneity. However, our study is not without limitations. There was heterogeneity between estimates of prevalence and incidence, which could be due to variable sampling methods, case ascertainment, and diagnostic methods. The quality of the included studies varied and some studies provided little information on sampling and data collection methodologies, though study quality was not associated with prevalence and incidence estimates. It was also impossible to conduct meta-analyses between some groups due to a smaller number of studies assessing those factors (e.g., under vs over age 65 years). Ideally, a multivariable meta-regression would have been employed to deal with the possible confounding effects of variables such as age and location, though this would have required a very large number of studies, and as such only stratified estimates are provided. Our finding that the annual period prevalence of epilepsy was lower than the point prevalence was unexpected and should be interpreted with caution. This finding was likely due to the large amount of heterogeneity (>99% for prevalence studies) that existed between these 2 groups of studies[1-16].

In all classification systems, the distinction between seizures primarily relies on whether the inception of these events in the cerebral cortex is of a focal or generalized origin. Therefore, all classification systems begin with a division of seizures between focal and generalized seizures. This is important because the choice of medical and surgical interventions will be dependent on the appropriate classification.

Focal seizures originate at some point within networks limited to one hemisphere. Focal seizures may originate within subcortical structures and they may be classified as focal without impairment of consciousness (clonic, autonomic, and hemiconvulsive), focal or subjective sensory or psychic phenomenon (aura specific), focal dyscognitive with impairment of consciousness, and focal evolving to a bilateral convulsive seizure. The term simple partial, complex partial, and partial seizure with secondary generalization has been embedded in the epilepsy lexicon for decades. There has been considerable resistance of letting go of these terms. However, simple means without alteration of consciousness, and complex implies altered awareness. Complex partial has been replaced by the term focal dyscognitive describing seizures with disturbed cognition as the prominent feature. The term secondary generalized seizure is replaced by focal seizure evolving to a bilateral convulsive seizure[17-29].

Generalized seizures imply a bilateral hemispheric onset and they are divided among six categories. These include tonic–clonic, absence with five subdivisions (typical, atypical, absence with special features, myoclonic absence, and eyelid myoclonia), myoclonic with three subtypes (myoclonic, myoclonic atonic, and myoclonic–tonic), tonic, clonic, and atonic.Neonatal seizures are no longer regarded as a separate entity. Seizures in neonates can be classified within this new scheme. Epileptic spasms are the acceptable term for infantile spasms because they may continue or begin after the first year of life. Because there is insufficient knowledge to classify these seizures as focal, generalized, or both, they have been placed in their own group.

The common standard measures of frequency of epilepsy in a population are incidence rate and prevalence rate. The incidence studies of epilepsies show that the age-adjusted incidence of epilepsy ranges from 16 per 100,000 person years to 111 per 100,000 person years depending on geographical location. The highest age-adjusted incidence in the world is in rural Chile with 111 cases per 100,000. Most studies show a range from 26 per 100,000 person years (in Norway) to 47 per 100,000 person years (in England).

Epilepsy, however, is associated with increased mortality, particularly, but not exclusively, in symptomatic cases. Different measures are used to estimate mortality depending on study design and available information. Mortality is best expressed as a standardized mortality ratio, which is the ratio of observed deaths (number of deaths in an epilepsy population) to that expected based on the age- and sex-specific mortality rates as a reference population in a given time. The proportional mortality ratio is the proportion of death owing to a particular cause in a cohort of patients in a given period and can be used to compare the relative contribution of various causes to the overall mortality in a population[30-45].

The risk factors for epilepsy in adults are somewhat established and are further discussed in the section, What Causes Epilepsy? There are several known risk factors for epilepsy in adults including head trauma, central nervous system (CNS) infections, such as neurocysticercosis, strokes, both embolic and hemorrhagic, CNS malignancies, particularly cortically based tumors, such as gliomas and metastatic lesions, Alzheimer's disease, and other neurodegenerative conditions. However, the relationship between epilepsy and other conditions, such as subcortical white matter diseases, demyelinating conditions, and certain psychiatric conditions (i.e., depression and schizophrenia), have not been sufficiently characterized. Numerous symptomatic epilepsies are attributed to acquired conditions. These include primary cerebral pathological processes as well as epilepsies caused by external or environmental causes. Seizures can result from anything that injures the brain with the types of injury depending on age. Seizures in children often are caused by birth trauma, infections such as meningitis, and congenital abnormalities. Nonaccidental brain injury, often underrecognized, is a relatively rare cause of symptomatic epilepsy in children. In middle years, head injuries, infectious etiologies, alcohol, stimulant drugs, and medication side effects commonly cause seizures. In older adults, a higher proportion of seizures are cause by brain tumors and cerebrovascular disease.

2. Methodology

The prospective observational study was carried out for a period of 6 months. The study was conducted in Pediatrics

department in a tertiary care hospital. A written and informed consent was obtained from the recruited patients. A Total of 220 patients were enrolled in the study.

Study Design: It was Prospective observational study.

Study Period: The Present study was conducted for a period of six months.

Study site: The Present study was conducted in a Neurology department of a tertiary care hospital.

Sample size: It was 220 Patients.

Inclusion criteria

- Patients who are willing to give consent.
- Patients with Seizure episodes.
- Patients of either sex, diagnosed with Seizure.
- Patients with clinical profile of Seizure.
- Patients receiving treatment for Seizure.

Exclusion criteria

- Patients below 18 years.
- Patients who were not willing to join in the study.
- Patients who are not diagnosed with respiratory abnormalities.
- Special population including pregnant women and lactating women.
- Psychiatric abnormalities.

Institutional ethics committee (IEC) consideration:

The research protocol was submitted to ethical committee and ethical Committee was permitted to perform the research work in Neurology department.

Patient data collection and management:

The data collection form contains information regarding age, sex, BMI, diagnosis, past medical history, laboratory data, and diagnostic results. The information about risk factors, clinical laboratory reports, treatment, dose and frequency of administration and duration of therapy was collected from the patients treatment chart.

Statistical analysis:

The data was represented as percentages. The $P<0.05$ was considered to indicate a statistically significant difference.

3. Results and Discussion

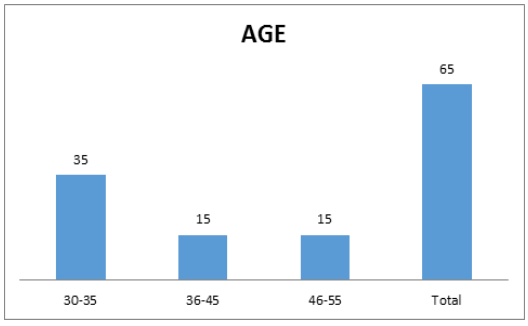

Fig.1: Age wise distribution

Table 1: Age wise distribution

S.No	Age	Total(N=65)	Percentage (%)
1.	30-35	35	53.84
2.	36-45	15	23.07
3.	46-55	15	23.07
	Total	**65**	

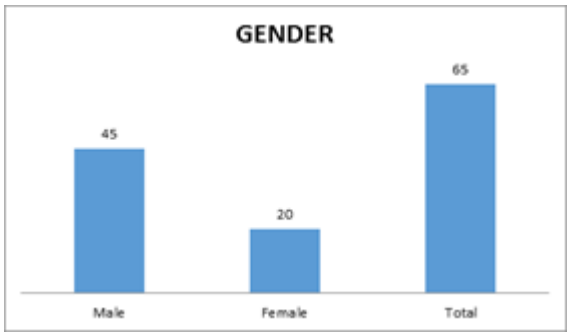

Fig.2: Gender

Table 2: Gender

S.No	Gender	Total (N=65)	Percentage (%)
1.	Male	45	69.23
2.	Female	20	30.76
	Total	**65**	

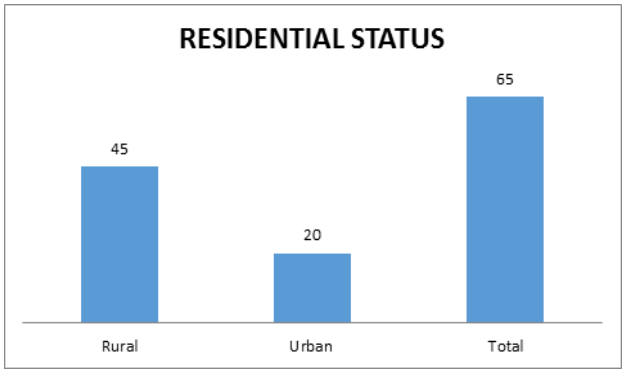

Fig.3: Residential status

Table 3: Residential status

S.No	Residential status	Total (N=65)	Percentage (%)
1.	Rural	45	69.23
2.	Urban	20	30.76
	Total	**65**	

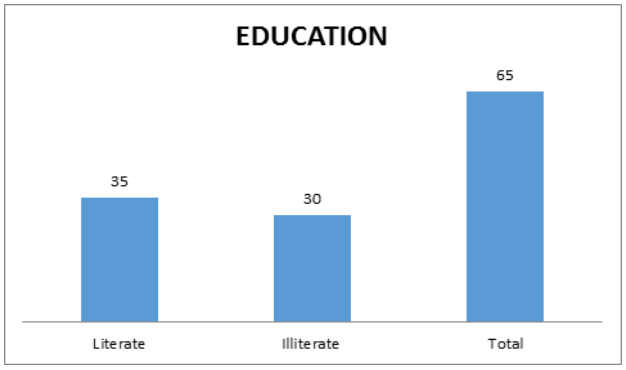

Fig.4: Education

Table 4: Education

S.No	Education	Total (N=65)	Percentage (%)
1.	Literate	35	53.84
2.	Illiterate	30	46.15
	Total	**65**	

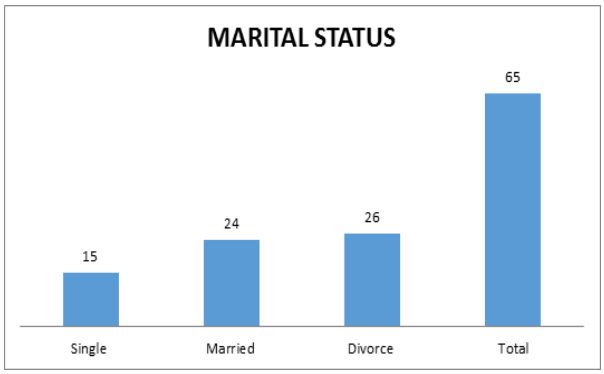

Fig.5: Marital status

Table 5: Marital status

S.No	Marital status	Total (N=65)	Percentage (%)
1.	Single	15	23.07
2.	Married	24	36.92
3.	Divorce	26	40
	Total	**65**	

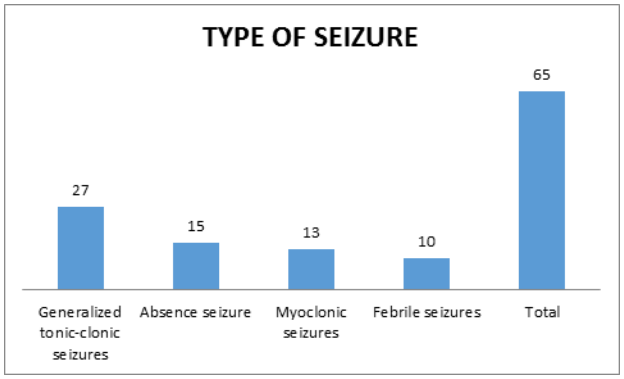

Fig.6: Type of seizure

Table 6: Type of seizure

S.No	Type of seizure	Total (N=65)	Percentage (%)
1.	Generalized tonic-clonic seizures	27	41.53
2.	Absence seizure	15	23.07
3.	Myoclonic seizures	13	20
4.	Febrile seizures	10	15.38
	Total	**65**	

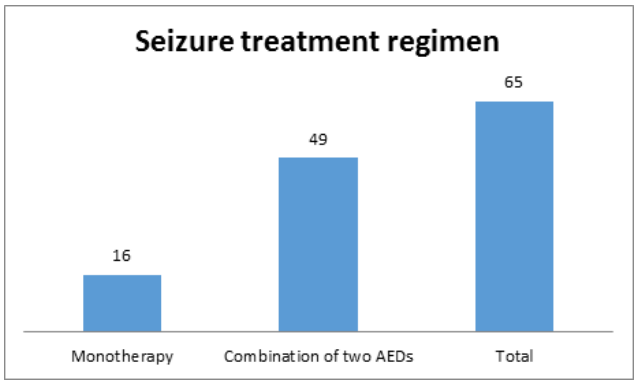

Fig.7: Seizure treatment regimen

Table 7: Seizure treatment regimen

S.No	AED treatment regimen	Total (N=65)	Percentage (%)
1.	Monotherapy	16	24.61
2.	Combination of two AEDs	49	75.38
	Total	**65**	

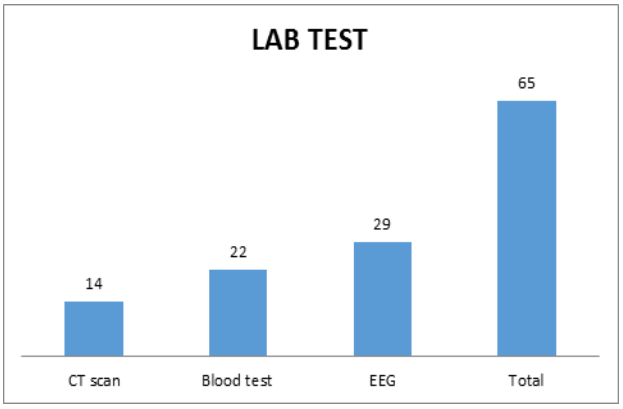

Fig.8: Lab test for seizures

Table 8: Lab test for seizures

S.No	Lab test	Total (N=65)	Percentage (%)
1.	CT scan	14	21.53
2.	Blood test	22	33.84
3.	EEG	29	44.61
	Total	**65**	

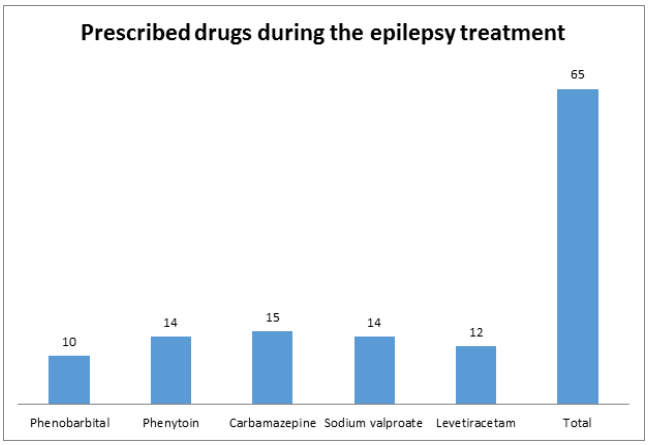

Fig.9: Prescribed drugs during the seizure treatment

Table 9: Prescribed drugs during the epilepsy treatment

S.No	Prescribed drugs	Total (N=65)	Percentage (%)
1.	Phenobarbital	10	15.38
2.	Phenytoin	14	21.53
3.	Carbamazepine	15	23.07
4.	Sodium valproate	14	21.53
5.	Levetiracetam	12	18.46
	Total	**65**	

Discussion

- In our study 30-35 years age patients were more 35 (53.84%) as compared to 36-45 years age patients were 15 (23.07%), 46-55 years age patients were 15 (23.07%).
- In our study male patients were more 45(69.23 %) as compared to female patients were 20(30.76 %).
- In our study Rural area patients were more 45 (69.23%), as compared to urban area patients were 20 (30.76 %).
- In our study Literate patients were 35 more (53.84%), as compared to Illiterate patients were 30(46.15%).
- In our study Divorce patients were more 26 (40%) as compared to other category patients.
- Generalized tonic-clonic seizures patients were more 27 (41.53%) as compared to Absence seizure patients were 15(23.07%), Myoclonic seizures patients were 13(20%), Febrile seizures patients were 10 (15.38%).
- In our study Family history of seizures patients were more 20(30.76%) as compared to Insomnia patients were 19 (29.23%).
- Combination of two AEDs patients were more 49 (75.38%) as compared to Monotherapy patients were 16 (24.61 %).
- ECG patients were more 29 (44.61%) as compared to CT scan patients were 14 (21.53%), Blood test patients were 22 (33.84%).
- Carbamazepine prescribed drugs patients were more 15(23.07%) as compared to Phenobarbital prescribed drugs patients were 10(15.38%), Phenytoin prescribed drugs patients were 14(21.53Sodium valproate prescribed drugs patients were 14 (21.53%), Levetiracetam prescribed drugs patients were 12(18.46%).

4. Conclusion

Individualizing drug therapy and therapeutic drug monitoring for each patient, along with patient factors such as medication compliance, concomitant drug and disease history, pharmacogenetic assessment, should be the ideal practice in patients with seizures for better seizure control. Newer drugs have been increasingly added to the list of antiepileptic drugs, but most of them serve as adjuvant to older ones and the important drugs used as monotherapy are still the older ones. The present study highlights the pattern of the use of older and newer AEDs resulting in good seizure control in different types of epilepsy. Prescription patterns are consistent with existing evidences regarding the continuum of efficacy of individual newer and older AEDs in different seizure types.

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