Drug Discharge and Gauging Of Anti Epileptic Drugs

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ABSTRACT

Background: Epilepsy is the second most common chronic neurological condition. Epilepsy means a tendency to have seizures i.e. recurrent unprovoked seizures. A seizure is a clinical events caused by an abnormal electrical discharge in brain (or) a transient disturbance of cerebral function due to an abnormal paroxysmal neuronal discharge in brain. Aims and Objectives: The main aim of the study is drug utilization evaluation of antiepileptic drugs among patients of different age groups in Jayabharath hospital, Andhra Pradesh. To assess drug utilization pattern of anti-epileptic drugs. METHODOLOGY: A prospective observational questionnaire based cross sectional study in 300 patients of various departments receiving at least one AEDs. The subjects were included in the study only after they met the criteria for the study and after properly filling a informed consent form. The data was obtained by a questionnaire format and it is evaluated for utilization patterns, medication adherence. The cost of AEDs were calculated to evaluate total costs on each drug. RESULTS: Out of 300 patients, 210 were male and 90 were female. The age group 11-20 years were found prominent with epilepsy. The average number of AEDs per patient was found to be 1.54. Among all the drugs prescribed phenytoin was the most common drug prescribed 223 (47.89%) for the treatment, followed by lorazepam 89 (19.09 %) and sodium valproate 40 (8.73 %). CONCLUSION: The use of AEDs was almost found to be rational. In this hospital the most commonly prescribed AEDs was phenytoin followed by lorazepam and in combinational therapy it was phenytoin + lorazepam. The utilization of drugs was obtained from the patients using questionnaire format and they showed high utilization of drugs.

Key words: Epilepsy, Utilization, Evaluation, Antiepileptic.

INTRODUCTION

EPILEPSY

Epilepsy is the second most basic interminable neurological condition. Epilepsy implies a propensity to have seizures for example repetitive unjustifiable seizures. A seizure is a clinical occasions brought about by an irregular electrical release in mind (or) a transient unsettling influence of cerebral capacity because of an anomalous paroxysmal neuronal release in cerebrum. The repeat rate after first seizure approaches 70 % during first year, most intermittent attacks happening inside month or two of first attack. Epilepsy is an incessant neurological issue that influences individuals all things considered in all ages. Around 50 million individuals worldwide have epilepsy two of first attack. Epilepsy is an incessant neurological issue that influences individuals of all ages. Around 50 million individuals worldwide have epilepsy. About 90 % of the individuals with epilepsy are found in developing regions. Epilepsy reacts to treatment 70 % of the time. Regardless of this, roughly 75 % of influenced individuals in developing regions don’t get the treatment they need. Individuals with epilepsy and their families experience the ill effects of disgrace and segregation in numerous parts of the world and.

Antiepileptic drugs for different type of seizures

| Seizure type      | First line treatment                  | Second line treatment     |
|-------------------|--------------------------------------|---------------------------|
| Partial seizures  | Carbamazepine,                       | Topiramate,               |
|                   | Oxcarbazepine and                    | Valproate,                |
|                   | Levetiracetam                         | Pregabalin,               |
|                   |                                      | Phenytoin,                |
|                   |                                      | Lacosamide               |
|                   | And                                  |                           |
ANTI-EPILEPTIC DRUGS (AEDs) Classification

| Seizure Type         | Drug Class                                                                 |
|----------------------|---------------------------------------------------------------------------|
| Generalized Seizures | Valproic acid, Lamotrigine                                               |
| Tonic clonic         | Carbamazepine, Clobazam                                                  |
| Tonic                | Lamotrigine, Phenobarbital                                               |
| Clonic               | Ethosuximide, Clonazepam, Lamotrigine                                    |
| Absence              | Sodium valproic acid, Lamotrigine                                        |
| Atypical absences    | Clonazepam, Carbamazepine, Valproic acid, Lamotrigine                    |
| Atonic               | Clobazam, Phenytoin, Acetazolamide                                       |
| Myoclonic            | Sodium valproate, Carbamazepine, Acetazolamide                           |
| Myoclonic            | Clonazepam, Carbamazepine, Acetazolamide, Ethosuximide, Gabapentin       |
| Myoclonic            | Topiramate, Zonisamide, Levetiracetam, Vigabatrin                         |

**DRUG UTILIZATION PATTERN**

The AED is prescribed for patients who are included in the study. Utilization of drugs by patient gets affected by various reasons like age, duration of therapy, expenditure on drugs etc. Hence it is important to know the extent of utilization of drugs by the patient for which a questionnaire format is prepared. Questionnaire for utilization pattern includes ten questions for which answers are obtained from the patient directly or patients' representatives. For every question each point is given so at the end of completing the format the patient will be given a score from 1 to 10 which decides the level of utilization of drugs by patient. Total scores can range from 1 to 10 and have been categorized into three levels of utilization for most utilization (score = 9 -10), modest utilization (score 7 to < 9), and slightest utilization (score < 7).

**STUDY SITE**

The study was conducted at MNR Medical Hospital, Sangareddy. It is a 560 bed's Tertiary care hospital, providing specialized health care services to all people in and around the area.
STUDY PARTICIPANTS
The subjects included in the study are 300 patients of both sexes receiving at least one AEDs in various departments. This was eligible for in patients during the entire study period. Patients who met the study protocol criteria were included and the required data were collected for in patients from case sheets and prescriptions, respectively.

SELECTION OF SUBJECTS

Inclusion criteria
- Patients of any age group including both sexes.
- Patients receiving at least one antiepileptic drug.

Exclusion criteria
- Pregnant women and neonates were excluded.
- Patients with liver complications are not involved in the study.

SOURCE OF DATA
Data was collected using a well-designed patient data collection form and by reviewing the patient’s case sheets, treatment charts and also by questionnaire format.

Preparation of data collection form
Information extracted from the case files included.
Demographic data, chief complaints, if he/she is a known case of epilepsy, habits (smoker, alcoholic, toddy), past medical history, past medication history, family history, laboratory tests and diagnosis (provisional and confirmatory).
Treatment: AEDs prescribed and prescription of AEDs by generic names. The recommended dosages of the AEDs were obtained from patient case profiles and discharge summary. The data regarding the brand of the drug used by patient is obtained. The utilization of drugs by patient is obtained by preparing a questionnaire format from which we can evaluate the level of utilization of drugs by patient.

STUDY PROCEDURE
After the approval from the institutional ethics committee, the study will be conducted by preparing a standard data collection form and also designing a questionnaire format for medication adherence to obtain specific information. Basic demographic information will be extracted from the case sheets and prescriptions and noted in data collection forms which contain the following information

Socio-demographic variables
- Age
- Sex
- Social status
- Marital status
- Number of AEDs used
- AEDs dose at initial visit and at every follow up
- AEDs dose range
- Changes in seizure frequency

AEDs utilization pattern include
- Number of AEDs prescribed per patient during study.
- Class of AEDs more prescribed.
- Number of AEDs prescribed using generic or brand names.
- Condition for usage of drug.
- Dosage regimen and frequency.

RESULTS AND DISCUSSION
The drug utilization evaluation was done from January to June 2017 in Government semi funds trustee hospital, Sangareddy. 200 patients were included in the prospective observational study. The demographic data revealed that number of male and female patients were 70% (210) and 30% (90), respectively.

Patient Demographic Data
Total no of Patients in this Study=300
Ratio Male/Female
  a. No. Of Male Patients=210 (70%)
  b) No. Of Female Patients=90 (30%)
Ratio = Male/Female=210/90=2.333
TABLE NO. 2: Distribution of age groups in patients

| Age in years | Total (%) | Male (%) | Female (%) |
|--------------|-----------|----------|------------|
| 1-10         | 6(2)      | 3(1.42)  | 3(3.33)    |
| 11-20        | 59(19.6)  | 32(15)   | 27(9.3)    |
| 21-30        | 75(25)    | 53(25)   | 22(25)     |
| 31-40        | 55(18.3)  | 43(14.2) | 12(4.1)    |
| 41-50        | 39(13)    | 27(12.85)| 12(4.1)    |
| 51-60        | 42(14)    | 30(14.28)| 12(4.1)    |
| 61-70        | 18(6)     | 16(7.85) | 2(1.66)    |
| 71-80        | 6(2)      | 6(2.85)  | 0(0)       |

Categorization of different patients prescribed with AED:

TABLE NO. 3: Overall AEDs utilization

| Therapy    | Total (N=300) | %  |
|------------|---------------|----|
| Monotherapy| 163           | 54.5|
| Dual therapy| 116          | 38.5|
| Triple therapy | 19     | 6.5 |
| Polytherapy | 2            | 0.5 |

AVERAGE NUMBER OF AEDS PRESCRIBED PER PATIENT

It is obtained by using a formula that is Avg no. of AEDs prescribed/patient=464 / 300=1.54

AED USE PROFILE

From the 300 prescriptions analyzed, phenytoin was the most common drug prescribed 223 (47.89%) for the treatment, followed by lorazepam 89 (19.09%) and sodium valproate 40 (8.73%), levetiracetam 33 (7.11%), diazepam 24 (5.17%), clonazepam 19 (4.20%), carbamazepine 16 (3.55%), clobazam 8 (1.61%), topiramate 6 (1.29%), phenobarbitone 6 (1.29%).

TABLE NO. 4: Graphical representation age specific distribution of AEDs

| Age in years | PHY | LOR | DIA | LEVE | VAL | CLON | PHB | CBZ | TOP | CLOB |
|--------------|-----|-----|-----|------|-----|------|-----|-----|-----|------|
| 1-10         | 6   | 2   | 1   | 0    | 1   | 0    | 0   | 0   | 0   | 1    |
| 11-20        | 42  | 15  | 3   | 3    | 18  | 1    | 5   | 5   | 0   | 3    |
| 21-30        | 49  | 21  | 3   | 15   | 9   | 11   | 0   | 5   | 0   | 2    |
| 31-40        | 42  | 21  | 5   | 6    | 3   | 6    | 0   | 4   | 5   | 0    |
| 41-50        | 29  | 13  | 6   | 5    | 5   | 0    | 0   | 1   | 1   | 2    |
| 51-60        | 32  | 13  | 5   | 2    | 4   | 1    | 1   | 1   | 0   | 0    |
| 61-70        | 18  | 4   | 1   | 1    | 0   | 0    | 0   | 0   | 0   | 0    |
| 71-80        | 4   | 0   | 0   | 1    | 0   | 0    | 0   | 0   | 0   | 0    |
TABLE NO. 5: Gender specific distribution of AEDs

| Drugs            | Total | Percentage | Male | %    | Female | %    |
|------------------|-------|------------|------|------|--------|------|
| Phenytoin        | 223   | 47.89      | 157  | 49.52| 66     | 44.44|
| Lorazepam        | 89    | 19.09      | 60   | 19.04| 29     | 19.99|
| Diazepam         | 24    | 5.17       | 15   | 4.76 | 9      | 6.06 |
| Levetiracetam    | 33    | 7.11       | 24   | 7.61 | 9      | 6.06 |
| Sodium valproate | 40    | 8.73       | 19   | 6.19 | 21     | 14.14|
| Clonazepam       | 19    | 4.2        | 12   | 3.8  | 10     | 5.05 |
| Phenobarbitone   | 6     | 1.29       | 5    | 1.42 | 1      | 1.01 |
| Carbamazepine    | 16    | 3.55       | 13   | 4.28 | 3      | 2.02 |
| Topiramate       | 6     | 1.29       | 6    | 1.9  | 0      | 0    |
| Clobazam         | 8     | 1.61       | 6    | 1.42 | 2      | 2.02 |

MOST FREQUENT COMBINATIONS OF AEDS

In epileptic patients most frequently prescribed monotherapy drugs are phenytoin followed by lorazepam. In dual combinations of AEDs were lorazepam/phenytoin (11.4%) and levetiracetam/phenytoin (10.5%). In triple AEDs regimen most common AEDs combination was levetiracetam/lorazepam/clonazepam.

TABLE NO. 6: specific distribution of mono therapy AEDs

| DRUGS            | TOTAL | %    |
|------------------|-------|------|
| Phenytoin        | 121   | 75.7 |
| Diazepam         | 1     | 0.93 |
| Levetiracetam    | 3     | 1.86 |
| Clonazam         | 1     | 0.93 |
| Carbamazepine    | 1     | 1.86 |
| Sodium valproic acid | 15   | 8.411|
| Lorazepam        | 18    | 10.28|

TABLE NO. 7: Gender specific distribution of dual therapy AEDs

| DRUGS            | TOTAL | %    | Male | %    | Female | %    |
|------------------|-------|------|------|------|--------|------|
| Phenytoin + Lorazepam | 36    | 30   | 21   | 28   | 15     | 33.33|
| Phenytoin + Sodium valproic acid | 6    | 5    | 5    | 6    | 1      | 3.33 |
| Phenytoin + Clonazepam | 5     | 3.75 | 3    | 4    | 2      | 3.33 |
| Phenytoin + Phenobarbitone | 1    | 1.25 | 0    | 0    | 1      | 3.33 |
| Sodium valproic acid + Lorazepam | 10   | 8.75 | 6    | 8    | 4      | 10   |
| Carbamazepine + Levetiracetam | 1    | 1.25 | 0    | 0    | 1      | 3.33 |
| Lorazepam + Topiramate | 3     | 2.5  | 3    | 4    | 0      | 0    |
| Lorazepam + Diazepam | 1     | 1.25 | 1    | 2    | 0      | 0    |
TABLE NO. 8: Gender specific distribution of triple therapy AEDs

| DRUGS                                               | TOTAL | %   | Male % | Female % |
|-----------------------------------------------------|-------|-----|--------|----------|
| Phenytoin + Sodium valproic acid + Lorazepam        | 1     | 8.33| 0      | 1        |
| Phenytoin + Carbamazepine + Clobazam                | 1     | 8.33| 1      | 12.5     |
| Phenytoin + Carbamazepine + Lorazepam               | 1     | 8.33| 1      | 12.5     |
| Phenytoin + Sodium valproic acid + Levetiracetam    | 1     | 8.33| 1      | 12.5     |
| Phenytoin + Lorazepam + Clonazam                    | 1     | 8.33| 1      | 12.5     |
| Phenytoin + Levetiracetam + Diazepam                | 1     | 8.33| 0      | 1        |
| Carbamazepine + Lorazepam + Phenobarbitone          | 1     | 8.33| 1      | 12.5     |
| Phenytoin + Lorazepam + Phenobarbitone              | 1     | 8.33| 0      | 1        |
| Phenytoin + Lorazepam + Diazepam                    | 1     | 8.33| 0      | 1        |
| Levetiracetam + Lorazepam + Clonazam                | 3     | 16.66| 3      | 25       |

TABLE NO. 10: Gender specific distribution of medication adherence

| Groups               | High Adherence (%) | Medium Adherence (%) | Low Adherence (%) | Total (%) |
|----------------------|--------------------|----------------------|-------------------|-----------|
| Male                 | 125(59.28)         | 72(34.28)            | 13(6.42)          | 210(70)   |
| Female               | 60(66.66)          | 24(26.66)            | 6(6.66)           | 90(30)    |
| Total                | 185(61.5)          | 96(32)               | 19(6.5)           | 300       |
TABLE NO. 13: Gender specific distribution of drug utilization

| Groups | Foremost Utilization (%) | Modest Utilization (%) | Slightest Utilization (%) | Total (%) |
|--------|--------------------------|------------------------|---------------------------|-----------|
| Male   | 176(80.13)               | 35(15.75)              | 9(4.1)                    | 220(73)   |
| Female | 71(87.03)                | 8(11.11)               | 1(1.85)                   | 80(27)    |
| Total  | 247(82)                  | 43(14.5)               | 10(3.5)                   | 300       |

CONCLUSION

Epilepsy is the most well-known neurological issue, and it is described by an unconstrained affinity for intermittent and unmerited seizures. The AEDs of decision must be made cautiously. In contrast to different examinations, it is probably explaining the unique drug utilization pattern. Monotherapy was most frequently utilized in a wide range of seizures. The most usually endorsed AEDs was phenytoin, followed by lorazepam, sodium valproate for epilepsy. Most patients were viably managed with the conventional oral AEDs.

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