Research Article

Follow Up Evaluation of Pediatric Epileptic Patients: A Prospective Clinical Study

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ABSTRACT

Objective: To investigate the follow up evaluation of pediatric epileptic patients and to determine the problems in epilepsy treatment that need improvement. Methods: This prospective study was conducted in the Neurology Department at Children Hospital Lahore. A Pharmaceutical Care Plan was developed which included Subjective information, Objective information, Assessment and Plan of the condition of patient followed by definitive plan for assessment of adverse drug reactions, drug-drug interactions and pharmacoecnomics. 100 patients having age ≤ 15 years with uncomplicated epileptic seizures were followed for seven months. Data was analyzed by routine statistical methods. Results: Commonly encountered cases were tonic clonic 39%, myoclonic 12%, petitmal 11% and complex partial seizures 9%. Results show that most commonly prescribed drug was Valproic acid used in 67% cases. Patients stable on monotherapy were 57 %. Patients with appropriate dose were 89%. Generic prescribing was done in 10% cases. Patient who received antibiotics and multivitamins were 19% and 21% respectively. Adverse drug reactions were observed in 13% cases. The patients with poor education, medium education and good education were 7.9, 63 and 28.6 percent respectively. Compliance was satisfactory in 72% patients. Patients with well-controlled fits were 25%. Mean cost of treatment for one month at start and end study was Rs. 576 ± Rs. 345 and Rs. 716 ± Rs. 422 respectively. Various wrong views about epilepsy are common in our society like patients who consider it due to evil spirits were 36%, and 24% of these patients in the start of disease strictly take a treatment from faith holders for the cure of disease. Conclusion: There is a great need for the education of our society about epilepsy and its proper treatment. The discrepancies observed in the treatment of epilepsy were due to absence of pharmacist in our health care system. If pharmacist checks all the prescriptions, maintains pharmaceutical care plan of all the patients under SOAP format and implements guidelines of Standard Pharmaceutical Care Plan, the quality of life of epileptic patients can be improved. Likewise, cost of the treatment can be reduced.

Keywords: Pediatric epileptic patients, Epilepsy, Pharmaceutical care plan, follow-up evaluation.

INTRODUCTION

Epilepsy is a complex symptom caused by a variety of pathologic processes in the brain. It is characterized by occasional (paroxysmal), excessive, and disorderly discharge of the neurons, that can be detected by clinical manifestations, electroencephalographic recording or both[1]. Epileptic seizures often cause transient impairment of consciousness, harming the body and often interfering with education and employment. The term 'seizure' refers to a transient alteration of behavior due to the disordered, synchronous, and rhythmic firing of populations of brain neurons[2].

It is the third most common neurological disorder, following stroke and Alzheimer's disease. The incidence has been estimated between 20 and 70 cases per 100,000 personsand the cumulative incidence (the risk of having the condition at some point in life) at 2-5%. The incidence is higher in first two decades of life but falls over the next few decades, only to increase again in late life, mainly due to cerebrovascular diseases.

Up to 5 % of people will suffer at least one seizure in their lifetime. However, the prevalence of active epilepsy is much lower and most patients have a very good prognosis. About 70-80% of all people developing epilepsy will eventually become seizure-free, and about half will successfully withdraw their medication. Once a substantial period of remission has been achieved, the risk of further seizures is greatly reduced. A minority of patients (20-30%) will develop chronic epilepsy, and in such cases, treatment is more difficult.

There is an increased mortality in people with epilepsy, especially among younger patients and those with severe epilepsy. Common causes of death in people with epilepsy include accidents (e.g. drowning, head injury, road traffic

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accidents), Status Epilepticus, tumors, cerebrovascular disease, pneumonia and suicide[3].

The first antiepileptic drug was bromide used in the late nineteenth century. Phenobarbital was the first synthetic organic agent recognized having anti-seizure activity. Anti-epileptic drugs used in the treatment of epilepsy include phenytoin, phenobarbital, carbamazepine, Valproic acid, clonazepam, clobazam, topiramate, lamotrigene, and prednisolone[4]. In this prospective clinical study, SOAP format is being used for the follow up evaluation of the patients. SOAP format is developed when the pharmacist starts working with the patient to evaluate, plan and record information.

Pharmacist documents and supports the subjective and objective sections by using SOAP format or modifying the treatment goals[5]. SOAP note format provides the pharmacist with a problem solving structure, requiring adequate documentation to verify treatment choices and organizing the pharmacist's plans regarding Quality Patient Care[6].

SOAP format may not assure hundred percent problem-solving skills, but it does provide a useful framework within which good problem solving is more likely to occur[7]. The purpose of SOAP notes is either to improve the quality and continuity of pharmaceutical care to enhance communication among mental health professionals or to facilitate the pharmacist in recalling the details of each patient's case, and to generate an ongoing assessment of both the patient's progress and treatment success[5,8].

Study population and methods
It was a prospective clinical study of pediatric epileptic patients, conducted at Children Hospital Lahore Pakistan, during the period of June 2007 to December 2007. Inclusion Criteria: Patients up to fifteen years of age, visiting neurology department at Children Hospital Lahore during the period of June 2007 to December 2007, having an uncomplicated epileptic seizures like tonic clonic, tonic, clonic, atonic, petitmal, simple and complex partial seizures etc. undergone clinical examination and specialized diagnostic procedures including EEG and serum electrolyte test, were included in the study. Exclusion Criteria: Patients with under-lying complications like T.B of brain, meningitis, or cases of neurosurgery like hydrocephalous were excluded. Moreover, patients having critical condition (Shock) were also excluded. Patients above 15 year of age were not taken into account. Study design: This prospective study involves the detailed interview of patient / parent about epileptic seizures, past medications and monitoring problems of treatment by using pharmaceutical care plan in OPD of the neurology department. The data regarding pediatric epileptic patients was taken on Standard Performa of Pharmaceutical Care Plan developed in SOAP format. SOAP noting is a viable method of pharmaceutical record keeping[5,8]. It is an abbreviation for Subjective (S), objective (O), assessment (A) and plan (P) with each initial letter representing one of the sections of the Pharmaceutical Care Plan. Data analysis: The data

obtained in the above methodology was statistically analyzed by employing routine methods.

RESULTS
Demographic data on disease occurrence in epileptic patients of Children's Hospital Lahore, during June 2007 to December 2007 is shown in Table No. 1. It indicates the occurrence of simple partial, complex partial and secondary generalized seizures is 3, 9 and 7 percent respectively. While occurrence of tonic clonic, tonic, clonic, myoclonic, petitmal, atonic, infantile spasm, is 39, 6, 3, 12, 11, 6, 4 percent respectively. Different treatments used in tonic clonic, tonic and clonic seizures are given in Table No. 2 and their graphical representation is shown in Figure No. 2. While the treatments used in myoclonic, petit mal, atonic and infantile spasm are shown in Table No.3. In this study of pediatric epileptic patients, treatments used in partial seizures like simple partial seizures (SPS), complex partial seizures (CPS) and secondary generalized (Sec generalize) seizures, are given in Table No. 4.

Evaluation of Dose
In different epileptic seizures, percentage of patients with appropriate dose, under-dose and overdose is shown in Table No. 5. The average of appropriate dose, under-dose and overdose in epilepsy is 89, 10 and 1 percent respectively.

Adverse Drug Reactions
In different epileptic seizures, percentage of adverse drug reactions observed isshown in Table No. 6. Mean of the percentage of adverse drug reactions observed in different epileptic seizures was 13 ± 8.

Compliance In Pediatric Epileptic Patients
Patients with very poor, poor and good compliance are shown in Table No. 7 at two levels; at first follow up visit and at last follow up visit i.e. at start of study and at end of study. Patients with good compliance at the end of study were 72.2%.

Patient / Parent Education about Epilepsy
Patients with poor, medium and good education were shown in Table No. 8 at two levels; at start and at end of follow up study. At the end of study, percentage of patients with poor medium and good education was 8%, 63% and 28.6 % respectively.

Degree of Disease Management (Response to Therapy)
Response to therapy by means of intractable, partially controlled, controlled and well controlled fits is shown in Table No. 9 at two levels i.e. at start and at end of follow up study. At the end of study, patients with well-controlled fits were 25 %.

Reasons Observed for Intractable Fits and Status Epilepticus
Intractable fits are usually controlled by the treatment. But many times, condition of controlled fits worsen to intractable fits or to a Status Epilepticus or intractable fits persist throughout the study. In this follow up study, 21 such cases of intractable fits and 3 of Status Epilepticus were observed. Percentage of patients affected by different causes is given in Table no. 10.

Spectrum of Management of Pediatric Epilepsy
In epilepsy, due to poor awareness about disease, people

Table 1: Occurrence of Epileptic Seizures.

Type of Seizure	No. of Patients
Simple partial seizure	3
Complex partial seizures	9
Sec generalized seizures	7
Tonic clonic seizures	39
Tonic seizures	6
Clonic seizures	3
Myoclonic seizures	12
Petit mal seizures	11
Atonic seizures	6
Infantile spasm	4
Total	100

go to different treating bodies for the treatment of epilepsy. The percentage of these treating bodies is given in the Table No. 11.

Parent/ Patient Views About Pediatric Epilepsy

Different views about epilepsy are common in our society. Summary is given in Table No. 12.

DISCUSSION

The regional office of WHO published a manual for physician for the treatment of epilepsy in New Delhi[9]. Another WHO manual recommended phenobarbitone, phenytoin, Valproic acid and carbamazepine for epilepsy treatment in Africa for medical and clinical officers[10]. Present study indicates that phenobarbitone and phenytoin are the cheapest anti-epileptic drugs that were used only in 12% cases. Valproic acid (67%) was the most commonly prescribed drug, both in mono and multiple therapies, as shown in Table and Figure No. 2-4. It was a very high percentage in contrast to other countries. Pooya conducted a study in Iran in 2005 revealing that phenobarbitone was the most common anti-epileptic drug (33.7%) because of two reasons; broad anti-epileptic action and economical price[11]. According to another study conducted in North West India, most of the epileptic patients were prescribed phenytoin due to its simple dosing schedule and economical price[12]. One dose of phenobarbitone and phenytoin costs Rs. 0.833 and minimum cost for one dose of valproate, topiramate and lamotrigene is Rs. 5, 10 and 13 respectively[13]. So, being a part of 3rd world country, the use of economical anti-epileptic drugs should be encouraged. Although, in some cases, new and expensive medication is necessary for better results, yet it should not be extensively prescribed for materialistic benefits only. Therefore, rational prescribing should be done according to Standard Pharmaceutical Care Plan.

Akhondian et al in 2006 conducted a study in Iran indicating that the patients with well-controlled fits were 39%[14], however, Kwong et al in 2003 conducted a study in China showing that the percentage of well controlled fits was 68.3%[15]. And the present work shows that the percentage of patients with controlled fits is only 25%. This emphasizes the need of a pharmacist for proper counseling, monitoring dose and compliance of epileptic patients for better treatment.

In a compliance study done on epileptic patients, compliance was good in 72.3% patients[11], whereas, in another study, it was observed to be 60-70%[16]. Table No. 7 shows that compliance is good in 72% patients, which is satisfactory, but most of the patients reach this level after experiencing the consequences of poor compliance in the very start. This may be due to less involvement of the pharmacist in the hospital.

Adverse drug reactions of anti-epileptic drugs were observed in 10.27% patients ina study[17]. average of which was 13% as shown in Table and Figure No.6. In this health care system, none of the accuracy of the dose prescribed, administered, appropriateness of a certain medication for a certain patient and monitoring of adverse drug reaction is being checked. Or else, ADR's would have been reduced if the mentioned measures were accurately observed.

Various wrong views about the treatment modes of epilepsy are present in certain 3rd world countries of Africa, India and Bangladesh. 26.4% patients in India believe that epilepsy is due to evil spirits, for what they go to faith holders for its treatment. Ayurveda (47.4%) is another treatment mode followed by homeopathy and naturopathy[12]. This research shows that 36% epileptic patients, in the very start, attribute it to evil spirits, seasonal changes or use of contraceptives by pregnant women etc. as mentioned in Table and Figure No. 12. According to this, percentage of patients seeking treatment from faith holders is 24%, Hakeems 11%, paramedics 13% and gynecologists is 2% as shown in Table and Figure No. 11. So, there is a great need to educate our society, especially rural areas, about epilepsy and its proper treatment.

Reasons Observed for Intractable Fits

Poor Patient/ Parent Education

Very often, patients are prescribed medications for fits only, whereas, epileptic patients need detailed counseling. A printed Performa for counseling is being developed by physicians but only a few of them give it to a few patients only. Furthermore, as most of the patients are uneducated, so they are unable to understand it. Patients suffer a lot due to lack of proper information about disease, medication and pharmacist in healthcare system.

The reason for relapse of intractable fits in 25% cases was poor parent education as shown in Table and Figure No. 10. Another reason is the discontinuation of medication once the fits are controlled. Patients usually discontinue the medication without completing the total duration of treatment and dose tapering. This causes the fits to relapse. Status Epilepticus occurred in 8.3% cases due to sudden withdrawal of anti-epileptic drugs as shown in Table No. 10.

Proper Dose

In present HealthCare setup, the reason of under-dosing of epileptic patients might be either improper calculation of the doses or less involvement of pharmacist in evaluation of the prescription. Patients reported with under-dose were 10%, out of which, fits were controlled in 6 cases as shown in Table no 5. But weight of the patients increased after a year of taking medication. Because of the controlled fits, readjustment of dose is not being considered by the physician due to shortage of time and hence, under-dose is continued, resulting in recurrence of fits as shown in Table No. 10.

Table 2: Different treatments used in tonic clonic, tonic and clonic seizures.

Treatments	Drugs used	Tonic Clonic	Tonic	Clonic
Treatment 1	Valproate	39	33	33
Treatment 2	Carbamazepine	15.4	17	0
Treatment 3	Phenobarbitone	0	17	0
Treatment 4	Topiramate	5	0	0
Treatment 5	Valproate+Topiramate	15	0	0
Treatment 6	Valproate+Lamotrigene	13	0	67
Treatment 7	Valproate+Phenobarbitone	2.5	0	0
Treatment 8	Carbamazepine+Valproate	2.5	0	0
Treatment 9	Carbamazepine +Topiramate	2.5	0	0
Treatment 10	Carbamazepine +Phenobarbitone	2.5	0	0
Treatment 11	Carbamazepine+Clobazam	0	33	0
Treatment 12	Phenobarbitone+Clonazepam	2.5	0	0

Table 3: Different treatments used in myoclonic, petitmal, atonic, and infantile spasm.

Treatments	Drugs used	Myoclonic	Petitmal	Atonic	Infantile spasm
Treatment 1	Valproate	42	82	83	0
Treatment 2	Valproate+Clonazepam	25	0	0	25
Treatment 3	Valproate+Phenobarbitone	8	0	0	0
Treatment 4	Valproate+Lamotrigene	0	9	17	0
Treatment 5	Valproate+Carbamazepine	0	9	0	0
Treatment 6	Valproate+Clonazepam+Prednisolone	0	0	0	25
Treatment 7	Phenobarbitone+Clonazepam	25	0	0	50

Table 4: Different treatments used in simple partial, complex partial and secondary.

Treatments	Drugs used	Simple partial seizure(SPS)	Complex partial seizure(CPS)	Secondary generalize seizure
Treatment 1	Carbamazepine	67	78	14
Treatment 2	Phenobarbitone	33	0	14
Treatment 3	Carbamazepine+Topiramate	0	11	0
Treatment 4	Carbamazepine +Valproate+Topiramate	0	11	0
Treatment 5	Valproate+Topiramate	0	0	29
Treatment 6	Valproate+Lamotrigene	0	0	14
Treatment 7	Valproate+Phenobarbitone	0	0	14
Treatment 8	Carbamazepine+Lamotrigene	0	0	14

Table 5: %age of patients on appropriate dose, under-dose and over dose in different epileptic seizures.

Type of Seizure	%age of App dose	%age of Under-dose	%age of Over dose
Tonic clonic	87	10	3
Tonic	83	17	0
Clonic	100	0	0
Myoclonic	92	8	0
Petit mal	73	18	9
Atonic	83	17	0
Infantile spasm	100	0	0
CPS	89	11	0
SPS	100	0	0
Sec. generalize	86	14	0
Average	89	10	1

Table 6: %age of adverse drug reactions (like drowsiness, diplopia and rashes etc.) in different epileptic seizures.

Type of Seizure	Percentage of ADRs
Tonic clonic	13
Tonic	17
Clonic	0
Myoclonic	17
Petit mal	18
Atonic	17
Infantile spasm	25
CPS	11
SPS	0
Sec. generalize	14
Mean	13±8

Prescription Errors

Prescription errors were the cause of intractable fits in 21% cases as given in Table No. 10. The reason may be any of the following;

Table 7: %age of patients showing very poor, poor and good compliance at two levels i.e. start.

Type of Seizure	Start of study			End of Study		
	% of Very poor compliance	% of poor compliance	% of Good compliance	% of Very poor compliance	% of poor compliance	% of Good compliance
Tonic clonic	18	46	36	3	28	69
Tonic	17	67	16	0	34	66
Clonic	0	33	67	0	33	67
Myoclonic	17	42	41	8	33	59
Petit mal	18	27	55	9	18	73
Atonic	17	33	50	0	17	83
Infantile spasm	0	50	50	0	25	75
CPS	11	56	33	0	22	78
SPS	0	33	67	0	34	66
Sec. generalize	14	43	43	0	14	86
Average	11.2	43	45.8	2	25.8	72.2

Table 8: %age of patients having, poor, medium and good education at two levels i.e. start and at end of study, in different epileptic seizures.

Type of Seizure	Start of study			End of Study		
	% of Poor education	% of medium education	% of Good education	% of Poor education	% Medium education	% of Good education
Tonic clonic	49	43	8	8	67	25
Tonic	33	67	0	0	83	17
Clonic	67	33	0	33	33	34
Myoclonic	42	58	0	0	83	17
Petit mal	45	55	0	9	64	27
Atonic	33	50	17	0	50	50
Infantile spasm	50	50	0	0	75	25
CPS	22	67	11	0	56	44
SPS	33	67	0	0	67	33
Sec. generalize	29	71	0	29	57	14
Average	40.3	56	3.6	7.9	63	28.6

Epileptic patients are asked to bring all of the past prescriptions along but the physician might consider it as the last visit prescription. Therefore, under-dose is being recommended by the physician without taking weight of the patient into account, resulting in intractable fits.

One case is the patient taking valproate only in the past prescription and was stable on combination therapy. The physician prescribed valproate after reviewing the past prescription only, referring to a monotherapy instead of combination therapy.

In another case, a patient was referred to a neurologist by the physician, informing him about the patient's medication i.e. valproate. The neurologist prescribed topiramate with dose mentioned along the previous prescription. The patient was not counseled properly with a detailed prescription so the retailer dispensed topiramate only. Result was intractable fits due to no involvement of the pharmacist.

Poor Compliance

Epileptic patients taking medication for a year should be aware of all aspects of the disease and the importance of compliance. Present research shows that 25% of the patients still had partially controlled fits at the end of the study due to partial compliance. And the reason for intractable fits in 12.5% cases was poor compliance as given in Table and Figure No. 10. Poor compliance can be due to either lack of parent education or economic problems that needto be dealt with governmental funds.

Another important cause is the availability of multiple brands in market but only limited brands are offered in hospital pharmacy. Patient of rural areas being prescribed those brands couldn't get them from their hometowns, resulting in poor compliance. Improper guidance of Zopiramate's (topiramate) availability prescribed by the physician was observed in 3 cases of the present study. For this reason, patients either do not use it at all or for few

Table 9: %age of patients having intractable, partial control, control and well control fits at two levels i.e. at start and end of study.

Type of Seizure	Start of study				End of Study			
	Intractable	Partial control	Control	Well control	Intractable	Partial control	Control	Well control
Tonic clonic	38	31	18	13	10	20	44	26
Tonic	50	17	33	0	0	33	34	33
Clonic	33	67	0	0	0	33	67	0
Myoclonic	50	33	17	0	8	42	42	8
Petit mal	36	18	46	0	18	27	18	37
Atonic	33	33	17	17	0	17	50	33
Infantile spasm	75	25	0	0	0	25	75	0
CPS	56	11	33	0	0	45	22	33
SPS	33	0	34	33	0	0	33	67
Sec. generalize	29	71	0	0	0	43	43	14
Average	43	30.6	19.8	6.3	3.6	28	43	25

Table 10: indicates the common causes of intractable fits and Status Epilepticus and percentage of patients affected.

Causes of intractable fits/ Status Epilepticus	% of patients with intractable fits	% of patient who suffer status epileptics
Prescription errors	21	4
Dispensing errors	8.3	0
Poor education of disease	25	8.3
Poor compliance	12.5	0
Brand change	12.5	0
Under dose	4	0
Inappropriate management	4	0

Table 11: Shows the different treating bodies and the percentage of patients used these treating bodies.

Treating Bodies	% age of patients
Faith holders	24
Hakeem	11
Quake	7
Paramedic	13
General practitioner	15
Pediatrician	9
Psychiatrist	5
Neurosurgeon	6
Neurologist	5
Gynecologist	2
Eye specialist	1
Homeopathic	2

days only due to unavailability in their hometowns, following intractable fits. Likewise, patients should get the same brand as prescribed.

Dispensing Errors
In this study,8% of the total cases reported the relapse of intractable fits due to dispensing errors as demonstrated in Table No. 10.

Two of the present cases with appropriate medication controlled fits reported that patients used Duphalac (Lactulose) instead of Dapakan (Sodium Valproate) and Valopril (Captopril) instead of Valpro (Sodium Valproate) due to dispensing errors. Therefore, patients exhibited diarrhea and hypotension respectively, along with the relapse of fits.

Causes of Dispensing Errors
a. Dispensing errors can be caused by participation of uneducated personnel in dispensing that should be done by a pharmacist or at least under his supervision.
b. Confusion can be created by the availability of a number of similar brands in the market.
c. Wrong interpretation of prescription by the patient can be resulted due to poor handwriting of the physicians.

Inappropriate Management
Anti-epileptic drugs may not be according to the type of seizure or condition of the patient, so the seizures persist. Study shows that 4% cases of intractable fits are due to inappropriate management as shown in Table No. 10.

Conclusion and recommendations
This study summarizes the occurrence of epileptic seizures in pediatric patients in Children Hospital Lahore from June 2007 to December 2007. Percentage of tonic clonic seizures was most common among children (39%) followed by myoclonic (12%), petit mal (11%) and finally partial seizures (9%). This emphasizes the need of effective measures regarding awareness and treatment of the disease. Percentage of patients on mono and multiple therapies were 57% and 43% respectively. Valproic acid is the most commonly prescribed anti-epileptic drug (AED). The use of economical drugs such as phenobarbitone and phenytoin should be promoted. Furthermore, expensive medications like topiramate and lamotrigene should be prescribed only after considering both; the economical drugs and status of the patient.

The need of a pharmacist to review prescriptions and educate health care staff is being emphasized due to poor dose adjustment in epileptic patients. Prescription errors can occur either due to confusion from multiple prescriptions or lack of much interaction of physician with the patient. Therefore, a Standard Performa should be used by the physician to collect patient's history and a registration no. should be allotted to the patient. This

Table 12: Shows percentage of patients having different views about epilepsy, most of which are not correct.

Parent/ patient views	% age of patients
Evil spirits, or due to shadow of spirits	36
Due to fear	5
Due to fever	8
Due to Hot season	3
Due to typhoid	2
Due to Pneumonia	3
Mental illness	5
No knowledge about the condition of patient	9
Nothing it will ok itself	3
Epilepsy/ fits	7
Meningitis	3
Caesarean baby	2
Weakness of brain or muscle	4
Due to Sorrow of any mishap	2
Due to Head injury	2
Stiffness by cold	1
Due to eating some narcotic thing from outside	1
Due to an unsuitable injection by a doctor	1
Eye problem	1
Germ in brain	1
Due to use of contraceptives by mother	1

enables the physician to recognize patient's record through that allotted no. and Performa on follow up visits. Furthermore, patient can be treated in a very short time with correct diagnosis. Prescription errors can be minimized this way.

Both patient and parent education about epilepsy plays a vital role in the effective treatment. Most of the times, patient won't complete duration of the effective treatment either due to poor parent education or considering epilepsy like other diseases, resulting in under-dose. Therefore, proper counseling should be done by the pharmacist about first aid measures, life style modifications, precautionary measures, ADR's along the duration and dose of treatment. Presence of the physician should be ensured in OPD's and duration of stay should be increased. This way, patient's communication and coordination with the physician can be improved. Proper counseling of the epileptic patients should be done to improve compliance. And, financial problems should be resolved either by prescribing an economical brand or through governmental funds. A Performa should be developed for evaluation of compliance. Patient should be guided to mark every dose taken. Furthermore, pharmacist can ensure the appropriate dose administered through serum levels. In the present study, the selection and use of broad spectrum antibiotics was on the basis of empirical therapy. Standard guidelines should be followed for the selection and use of appropriate antibiotic to reduce the chances of antibiotic resistance and cost of therapy.

Fits may be relapse due to unnecessary change of the already prescribed brand. Non-professional staff involved in the treatment of epilepsy should be discouraged. Furthermore, educational programs should be organized to raise awareness among population. The treatment of epilepsy can be improved when prescribing procedures are standardized, communicated periodically and validated against the set standards. Reviewing prescriptions, monitoring ADR's and counseling should be done by a pharmacist and rational use of anti-epileptic drugs should be promoted.

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