

Common Prescribing Errors in Childhood Epilepsy: A Report from a Tertiary Care Teaching Hospital Of Northern India

Chandra Kanta, Bhanu Pratap Rathore, Shakal Narayan Singh, Rashmi Kumar

¹Dr Chandra Kanta, MD,

Associate Professor, Department of Pediatrics, King George's Medical University, Lucknow, India

²Dr Bhanu Pratap Rathore, MD,

Senior resident, Department of Neurology, King George's Medical University, Lucknow, India

³Dr Shakal Narayan Singh, MD,

Professor, Department of Pediatrics, King George's Medical University, Lucknow, India

⁴Dr Rashmi Kumar, MD,

Professor & Head, Department of Pediatrics, King George's Medical University, Lucknow, India

Abstract:

Inappropriate treatment of epilepsy can lead to side effects as well as poorly controlled seizures. This study was done to find out some common prescribing errors in the management of childhood epilepsy. We evaluated 148 prescriptions of 132 patients attending outdoors for the first time. Various prescribing errors were categorized as - diagnostic errors, errors in drug doses and spacing between two doses, errors in starting antiepileptic drugs (AED), errors in choosing AED, irrational polytherapy and inappropriate duration of treatment. We observed various prescribing problems in 41 (27.7%) prescriptions and 12 (8.1%) had more than one errors. Most common prescribing problems found were irrational polytherapy (13.5%) and drugs doses related (12.8%). Errors related to diagnosis, starting AED, type of drug and treatment duration related problems were found in 5 (3.4%), 5 (3.4%), 4 (2.7%) and 2 (1.4%) cases respectively. In conclusion, mismanagement of childhood epilepsy is common in India and needs improvement.

Key words:

Prescribing errors, childhood epilepsy, Antiepileptic drugs

INTRODUCTION:

Epilepsy is a common pediatric problem and approximately 6-7% of children suffer at least one or more epileptic seizures. ⁽¹⁾ Prevalence is probably high in resource poor countries. Children with epilepsy are prescribed antiepileptic medication with the aim of control of seizures and minimum drug side effects. As most of the antiepileptic drugs have a narrow therapeutic and safety margin, high doses of antiepileptic drugs can lead to side effects, on the other hand suboptimal doses will lead to recurrence of seizures. Also, wrongly chosen drugs result in poor control of epilepsy or sometimes increase in seizures frequency.

Studies done in adult patients have shown that errors in prescribing antiepileptic drugs are a common problem and many times responsible for the poor control of seizures. ⁽²⁻¹⁵⁾ Chances of prescribing errors are even more in case of children as drug doses need to be adjusted according to weight and age of the child. Recently a large number of new antiepileptic drugs have been introduced for treatment of epilepsy. Addition of these new drugs has also contributed to a therapeutic confusion. Only meager studies have been done to find out problems in treatment of epilepsy in India and none of these was focused on pediatric epilepsy. So this study was planned to find out some common prescribing errors in the management of childhood epilepsy.

METHODS:

This cross sectional study was done in pediatric outpatients of King George's Medical University, Lucknow, from

September 2009 to August 2011. Children aged between 1 month- 14 years with complaints of seizures or taking antiepileptic drug, attending the children OPD first time on Tuesdays and Thursdays were included in the study. Enrolled patients/ parents of patients were interviewed according to the pre designed proforma. Detailed history, examination findings, investigations and details of prescribing physicians except name and address were recorded on data collection forms. Prescriptions were reviewed by the physician in charge children OPD/ child neurology clinic. Prescriptions were assessed on the basis of general principles of management of epilepsy. Drug doses used were compared with the recommended doses as per Nelson's Textbook of Pediatrics, 18th Edition. Data was entered on a Microsoft excel sheet and analyzed by using Epi info software. Written informed consent was obtained from parents/ guardians of patients. Patients taking treatment from our institution were excluded. We also excluded prescriptions with insufficient details and when consent was not given by caregivers. Ethical clearance was obtained from Institutional Ethics Committee prior to the study.

Various prescribing errors were categorized in to following categories-

1. Diagnostic errors: Diagnostic error was considered when diagnosis of seizure disorder was made in conditions which mimic seizure like breath holding spells or diagnosis of seizure disorder was missed when the child suffered from true seizure.

2. Errors in drug doses and spacing between two doses: Drug doses were compared to the doses as per Nelsons Textbook of Pediatrics 18th Edition.
3. Errors in starting antiepileptic drugs: If AED were prescribed when it was not indicated or did not received AED when it was indicated, were included in this category.
4. Errors in choosing AED: The drug which exacerbate, ineffective or contraindicated in particular type of seizure, were categorized in this group.
5. Irrational polytherapy: Irrational polytherapy was decided when two drugs were started simultaneously or second drug was added when first drug was not on maximum dose.
6. Inappropriate duration of treatment: Prolong AED therapy in case of acute symptomatic seizures. In case of epilepsy treatment stopped before 2 years or continued even beyond 3 years seizure free interval.

RESULTS:

We evaluated 148 prescriptions by various practitioners from 132 patients. Average age of enrolled patients was 3.6 \pm 3.2 years and male to female ratio was 3:1. Majority of patients had generalized tonic clonic and partial seizures. Perinatal asphyxia and neonatal illness were the commonest risk factors associated with epilepsy in present study. Ninety one (61.5%) prescriptions were from pediatricians and 57 (38.5%) were from non pediatricians which included 5 (3.4%) adult neurologists, 4 (2.7%) neurosurgeons, 22 (14.9%) MBBS doctors, 26 (17.6%) doctors of other medicine disciplines. Profile of enrolled cases is given in table-1.

We observed various prescribing problems in 41 (27.7%) prescriptions and 12 (8.1%) had more than one errors. Two common prescribing problems found were irrational polytherapy (13.5%) and drug dose related (12.8%). On comparing the pediatrician and non pediatrician's prescriptions no significant difference was found though dose related problems were less in the pediatrician group. Details are given in table-2.

TABLE 1: PROFILE OF ENROLLED PATIENTS (n= 132)

Age		3.59 years (SD =3.18 years)
Male: Female ratio		3:1
Types of seizures	Generalized tonic clonic	80 (60.6%)
	Generalized tonic	14 (10.6%)
	Partial seizures	23 (17.4%)
	Myoclonic	13 (9.8%)
	Seizure mimicking condition	1 (.8%)
Risk factors for epilepsy	Perinatal asphyxia	62(47.0%)
	CNS malformations	6(4.5%)
	Neonatal illnesses	18(13.6%)
	CNS infections	13 (9.8%)
	Family history of epilepsy	4 (3.0%)
	neurocysticercosis	10 (7.6%)
	Others	4 (3.0%)
	No risk factor	15 (11.4%)
Investigations done before enrolment	CT Scan	92 (69.7%)
	MRI	8 (6.1%)
	EEG	65 (49.2%)

TABLE 2. VARIOUS PRESCRIBING PROBLEMS (n= 148)

Prescribing errors	Pediatricians (n= 91)	Non pediatricians (n= 57)	Total (n=148)
Diagnostic errors	3 (3.3%)	2 (3.5%)	5 (3.4%)
Errors in drug doses and spacing between two doses	5 (5.5%)	14 (24.6%)	19 (12.8%)
Errors in starting antiepileptic drugs	2 (2.2%)	3 (5.3%)	5 (3.4%)
Errors in choosing AED	2 (2.2%)	2 (3.5%)	4 (2.7%)
Irrational polytherapy	11 (12.1%)	9 (15.8%)	20 (13.5%)
Inappropriate duration of treatment	0 (0%)	2 (3.5%)	2 (1.4%)
Number of prescriptions with errors	19 (20.9%)	22 (38.6%)	41 (27.7%)
Number of prescriptions with more than one errors	4 (4.4%)	8 (14.0%)	12 (8.1%)

DISCUSSION:

Literature has revealed that there is significant gap between management required and actual management received by epilepsy patients. Based at a teaching hospital of northern India we had an impression that many of childhood epilepsy cases are receiving inappropriate antiepileptic drugs. As very few studies are available on this subject and none of these was focused on AED prescribing problems in childhood epilepsy in our region we planned this prospective cross sectional study.

About two third prescriptions were from pediatricians and very few by adult neurologists and neurosurgeons. Others were treated by doctors of other discipline or MBBS doctors. Almost all prescriptions were from practitioners practicing in urban areas. This shows non availability of qualified doctors in the field of pediatric neurology in our region. This condition is even worse in rural areas where qualified doctors and facilities for proper investigations are not available. In present study neuroimaging was done in 64.2% and EEG in 33.1% patients. Therapeutic drug monitoring was not done in any case, which may be because of limited facilities for this. Thomas SV et al also concluded that in Indian cities services for epilepsy are urban based and majority of patients with epilepsy before referrals are treated by the general practitioners and facilities like therapeutic drug monitoring and epilepsy surgery are limited.^(2,6)

Prescribing errors were present in about one third prescriptions. Five prescriptions had a problem with diagnosis of epilepsy. Out of that five in one case of non epileptic event was misdiagnosed as epilepsy. In four cases diagnosis of epilepsy was missed, all were having infantile spasms. Many times mothers are not aware about the fact that these spasms are actually seizures. They come out with the history only when particularly asked about startling episodes. Absence seizures are the other type seizure often missed but we did not find any case. Newton et al found that pediatricians make a diagnostic error up to one in three children where epilepsy is concerned.⁽³⁾ Similarly Kanner et al found that 1 out of 4 to 5 patients admitted to video EEG monitoring unit had non epileptic events.⁽⁴⁾

Irrational polytherapy was the most common problem we found. In 2.7% patients two drugs were started simultaneously initially and in 10.8% patients second drug was added when first drug was not on maximum doses. We know that antiepileptic drug therapy is mostly required for long duration and all antiepileptic drugs are not free from side effects. So, if any unnecessary drug is given child has to tolerate its side effects for long duration which can have a life long impact on his health. We noticed that irrational polytherapy was commonly prescribed by both - pediatricians and non pediatricians group. Goodwin M in a survey of epilepsy clinic found that many patients were taking unnecessary medication and suffering unnecessary side effects.⁽⁵⁾ Lambie DG et al also reported unnecessary polytherapy in epilepsy in Europe.⁽¹⁵⁾

Drugs were not prescribed in right doses in 12.8 % of cases. It was noticed that either the weight of child was not

mentioned or tablet size was not specified in most of these prescriptions. Dose problems were found more in prescriptions from non pediatrician groups. As pediatricians have a habit of calculating all drug doses according to the weight of patients, antiepileptic drugs prescribed by them were mostly in accurate doses. We know that inadequate doses might lead to poor control of seizures and overdoses can lead to severe side effects.

Antiepileptic drugs were not chosen properly in 4 (2.7%) prescriptions. These patients were mostly having Myoclonic seizures/ infantile spasms getting phenobarbitone, phenytoin or carbamazepine. These drugs are not effective in myoclonic seizures and carbamazepine can lead to exacerbations also. Inappropriate duration of treatment was found only in two prescriptions. In these cases prolong antiepileptic drugs were prescribed for acute symptomatic seizures.

In conclusion mismanagement of childhood epilepsy is very common. So improvement is required in management of pediatric epilepsy in primary care and liaison between primary and secondary care.

REFERENCES:

1. Major P, Thiele EA. Seizures in Children; Determining the Variation. *Pediatrics in Review* Vol. 28 No. 10, 2007 pp. 363 -371
2. Thomas SV, Kutty R, Alexander A. Management and referral patterns of epilepsy in India. *Seizure*. 1996 Dec;5(4):303-6
3. Newton RW. The treatment of epilepsy. *Arch Dis Child*. 2006 May; 91 (5): 452
4. Kanner AM. Common errors made in the diagnosis and treatment of epilepsy. *Semin Neurol*. 2008 Jul; 28(3):364-78.
5. Goodwin M, Wade D, Luke B, Davies P. A survey of a novel epilepsy clinic. *Seizure*. 2002 Dec; 11 (8):519-22.
6. Thomas SV, Sarma PS, Alexander M, Pandit L, Shekhar L, Trivedi C, Vengamma B. Epilepsy care in six Indian cities: a multicenter study on management and service. *J Neurol Sci*. 2001 Jul 15; 188(1-2):73-7.
7. Smith D, Defalla BA, Chadwick DW. The misdiagnosis of epilepsy and the management of refractory epilepsy in a specialist clinic *Q J Med* 1999; 92:15-23
8. Bassili A, Omar T, Zaki A, Fattah MA, Tognoni G. Pattern of diagnostic and therapeutic care of childhood epilepsy in Alexandria, Egypt. *International journal for quality in health care*. 2002, vol 14, no 4: 277-284
9. Piskorska B, Miziak B, Czuczwar SJ, Borowicz KK. Safety issues around misuse of antiepileptics. *Expert Opin Drug Saf*. 2013 Sep; 12(5):647-57
10. Richard Morton. Epilepsy care is deficient for both patients and doctors. *BMJ* 2002; 324: 1219
11. Jacoby A, Jones SG, Baker G, Ratoff L, Heyes J, Dewey M, Chadwick D. A general practice records audit of the process of care for people with epilepsy. *British Journal of General Practice*. 1996, 46, 595-599.
12. Beghi E, Sasanelli F, Spagnoli A, Tognoni G. Quality of care of epilepsy in Italy: multi-hospital survey of diagnosis and treatment of 1104 epileptic patients. *Epilepsia*. 1982 Apr; 23(2):133-48.
13. Jose VM, Medhi B, Pandhi P. Antiepileptic TDM pattern at a tertiary care hospital in India. *Nepal Med Coll J*. 2006 Jun;8(2):107-10.
14. Hopkins A, Scambler G. How doctors deal with epilepsy. *Lancet* 1977 Jan 22;1(8004):183-6.
15. Lambie DG, Johnson RH, Stanaway L. Prescribing patterns for epilepsy. *N Z Med J*. 1981 Jul 8;93(687):15-9.