

Occasional Survey

Evaluation of Paediatric Epilepsy Care

KL KWONG, WK CHAK, KT SO

Abstract

Basic standards for the process of paediatric epilepsy care were identified and applied in a clinical audit. Recommended elements of good practice include quality of prescribing practice, medical records, use of neuroimaging and requests for electroencephalogram (EEG). We reviewed medical records for patients with newly diagnosed epilepsy and requests for EEG. Four standards regarding epilepsy care were met in 100% and seven out of 8 standards were met in 75% of cases. Documentation of advice given to parents about possible side effects of drugs was only recorded in 13% of patients. The prescription of first line antiepileptic drugs and adequate dosage before considering a first line drug to have failed was achieved in 100% of our patients. One third of clinicians ordering EEG for the purpose of diagnosing epilepsy or convulsion. Requests were considered appropriate in 37% of cases. The present study suggested that we could improve our patient management in better provision and documentation of parental education concerning side effects of drug. Practical advice and recommendations were required in the role and clinical relevance of EEG.

Key words

Audit; Childhood; EEG; Epilepsy

Introduction

Epilepsy is one of the most common neurological disorders in childhood. It has a prevalence of 4-7/1000.¹ An increased interest in childhood epilepsy has been witnessed in the latest decade or two. The classification of epileptic seizures and syndromes has been refined. Diagnostic tools have been improved. Many new antiepileptic drugs have been approved worldwide. The use of epilepsy surgery is increasingly recognized as a therapeutic option for children with intractable epilepsy. Audit of epilepsy care, as an integral part of the assessment of the quality and effectiveness of clinical practice, however,

has been largely neglected.

Seizure control as a measure of outcome will depend both on the biological severity of the underlying epilepsy and the process of care provided. It is the process of care that is most amenable to critical review and amendment.² Defining standards to which clinical practice can be compared is a prerequisite for clinical audit. International accepted standards in evaluating epilepsy care have still not yet been established. One of the reasons being the complexity of a chronic neurological disorder, management of epilepsy extends far beyond prescription of medication. Psychological, educational and social problems are much more important than the seizures and their treatment. However, basic standards of good clinical practice can be more readily agreed among neurologists. Webb et al. identified standards for an auditing process in a children epilepsy clinic. These standards were drawn up after consultation among all the local paediatricians.³ National standards agreed by the British Paediatric Neurology Association for assessing outpatient appointment of children referred for suspected epilepsy are available.⁴ Elements of good practice in the management of children

Department of Paediatrics, Tuen Mun Hospital, Tsing Chung Koon Road, Tuen Mun, N.T., Hong Kong, China

KL KWONG (鄺玲) MRCP(UK)

WK CHAK (翟偉光) MRCP(UK)

KT SO (蘇鈞棠) MRCP(UK)

Correspondence to: Dr KL KWONG

Received December 3, 2001

with epilepsy include the quality of prescribing practice, correspondence or medical records, use of neuroimaging and requests for electroencephalogram (EEG).

The aim of the study is to evaluate our care for children with epilepsy using the recommended standards and to identify areas of improvement.

Methods

Medical records of children with newly diagnosed epilepsy seen in the Neurodevelopmental Clinic of Tuen Mun Hospital, Hong Kong, between January 1998 and December 1998, were reviewed. Children with only neonatal seizures, acute symptomatic seizures, febrile convulsion and isolated seizures were excluded. Electroencephalogram requests irrespective of indications in January 1998 were studied.

With reference to recent recommendations,³⁻⁶ we applied 8 standards for assessing paediatric epilepsy care relating to the quality of clinical information (standards 1-5), prescription practice (standards 6-7) and appropriateness of neuroimaging (standard 8). Electroencephalogram

Table 1 Clinical standards applied assessing paediatric epilepsy care and EEG requests

8 standards for assessing paediatric epilepsy care

Clinical information

1. Seizure description/classification
2. Seizure frequency at presentation
3. Response to drug changes
4. Recording advice about possible drug adverse effects
5. Developmental/school progress

Prescribing practice

6. First line antiepileptic drugs
7. Adequate trial of first line drug before considered to have failed

Neuroimaging

8. CT/MRI brain in partial epilepsises (except benign epileptic syndromes)

6 standards for EEG request

1. Seizure details
2. Family history
3. Drug history
4. Provisional diagnosis
5. Purpose of EEG
6. Request appropriateness

requests were assessed by 6 standards (Table 1). Standards that were not met 80% of the time would be considered failure.

Results

Epilepsy Care

Results of our care for children with epilepsy are depicted in Table 2. The number of children with newly diagnosed epilepsy was 24. Four standards were met in 100% and seven out of 8 standards were met in 75% of cases.

Four of the 5 standards in assessing the quality of clinical information were met. Seizure description and frequency were recorded in 100% of patients. However, documentation of advice given to parents about possible side effects of drugs was only recorded in 13% of patients. The prescription of first line antiepileptic drugs and adequate dosage before considering a first line drug to have failed was achieved in 100% of our patients. Appropriate neuroimaging of children with epilepsy was performed in 94% of patients.

Electroencephalogram Requests

There were 61 consecutive requests for EEG. Detailed results are shown in Tables 3 and 4. We failed in five standards. Requests were considered appropriate in only 37% of cases. Information concerning drug details and seizure description was provided in 38% and 74% of the requests respectively. The vast majority of provisional diagnoses were seizure or epilepsy related, only 16% of patients had an alternative diagnosis including

Table 2 Results of paediatric epilepsy care

	<u>Number (%)</u>
<i>Clinical information</i>	
Seizure description/classification	24 (100)
Seizure frequency at presentation	24 (100)
Response to drug changes	19 (80)
Recording advice about possible drug adverse effects	3 (13)
Developmental/school progress	23 (96)
<i>Prescribing practice</i>	
First line antiepileptic drugs	24 (100)
Adequate trial of first line drug before considered to have failed	24 (100)
<i>Neuroimaging</i>	
CT/MRI brain in partial epilepsises (n=16)	15 (94)

Table 3 Results of EEG requests

	Number (%)
Seizure description	39 (74)
Family history	32 (60)
Drug history	20 (38)
Provisional diagnosis	52 (82)
Purpose of EEG	48 (79)
Request appropriateness	18 (37)

Table 4 Provisional diagnosis and purpose of EEG stated

	Number (%)
Provisional diagnosis stated	52
Epilepsy	23 (44)
Febrile seizure	7 (13)
Convulsion	10 (19)
Funny turns	4 (8)
Hypoxic-ischaemic encephalopathy	5 (10)
Headache	2 (4)
Encephalopathy	1 (2)
Purpose of EEG stated	48
Febrile seizure	5 (10)
Diagnosing epilepsy	14 (29)
Diagnosing convulsion	2 (4)
Evaluation of convulsion	6 (12)
Evaluation of epilepsy	8 (19)
Exclude intracranial pathology	9 (19)
Prognosis of hypoxic-ischaemic encephalopathy	3 (6)
Encephalopathy	1 (2)

Table 5 Comparison of results of epilepsy care

	Present study	Webb's study %
Clinical information		
Seizure description/classification	100	76
Seizure frequency at presentation	100	92
Response to drug changes	80	98
Recording advice about possible drug adverse effects	13	11
Developmental/school progress	96	84
Prescribing practice		
First line antiepileptic drugs	100	99
Adequate trial of first line drug before changing	100	80
Neuroimaging		
CT/MRI brain in partial epilepsises	94	93

encephalopathy or headache. The purpose of EEG was not given in 13 (21%) patients, 33% of the clinicians ordering EEG for the purpose of diagnosing epilepsy or convulsion. An additional 19% requested EEG to exclude intracranial pathology.

Discussion

This small pilot study is the first survey done in a Chinese population assessing our level of care in paediatric epilepsy, we showed that it was possible to apply some basic standards for the evaluation of our clinical practice. Our results of our epilepsy care compare favorably with that of Webb's study (Table 5).³ The only criteria that failed in the present study is the recording of parental counseling concerning the side effects of antiepileptic drugs. This audit has also demonstrated that practical advice and recommendations are still required on the role and clinical relevance of EEG.

Quality of clinical information forms an essential part in the management of children with epilepsy. It should contain seizure frequency, neurodevelopmental, behavioral and education progress and provide adverse effects of treatment.⁷ In the standards assessing quality of information, we were able to met 2 standards in all the patients. Seizure description and frequency were documented in all records. However, only 13% of our case notes contained parental advice on the side effects of antiepileptic drugs. Lack of documentation concerning possible adverse effects of medication was similarly observed in Webb's study. In an audit of a children' epilepsy clinic, 50% of parents demanded more discussion on side effects of antiepileptic drugs.⁸ Inadequate parental information may result in poor drug compliance and misconception about treatment.

Monotherapy with first line drugs is desirable in the treatment of children with epilepsy.⁶ Sodium valproate and carbamazepine are the accepted first line drugs.⁹ Failure to prescribe sodium valproate or carbamazepine in adequate dosage will lead to polypharmacy, increased use of more expensive second line drugs. We were able to meet these 2 standards in 100% of our patients. Neuroimaging is recommended in suspected symptomatic partial epilepsies. The standard was met in 94% of our patients and in 93% of Webb's study. The yield of abnormalities is highest in children with partial seizures who had focal abnormalities on EEG and on neurological examination.^{10,11} In fact, neuroimaging should be considered during the evaluation of children with newly diagnosed epilepsy, especially for

those with neurological deficits, or partial seizures or focal EEG abnormalities that are not part of an idiopathic localization-related epilepsy.¹²

This study has emphasized the inadequate information provided in EEG requests. Five out of 6 requests were failed in the present study with the worst performance observed in the areas of requests appropriateness and drug information. Less than half of our EEG requests were considered appropriate. Compared to the study carried out by Nicolaides et al., in which 37% of the requests were considered inappropriate.⁶ In another recent audit of EEG, inappropriate EEG requests were observed in 55.7% of cases.¹³ This may be related to inadequate history taking or to a poor understanding of epilepsy. It also reflects the common misconception that EEG could diagnose or excluded epilepsy or seizure disorders, one third of EEG requests in our study were indeed performed with the purpose to diagnose epilepsy or convulsion. EEG is considered helpful in classifying epilepsy and occasionally useful in supporting the diagnosis when clinical suspicion is high, but it is rarely the sole determinant of the diagnosis. The combination of equivocal symptoms and non-specific abnormalities carries a risk of misdiagnosis of epilepsy. The financial savings identified in this audit are likely to be trivial in comparison to social and medicolegal implication associated with misdiagnosis of epilepsy. Intervention should involve an educative, non-confrontational approach to demonstrate to clinicians the limitations and pitfalls of the interictal EEG and that in patients with 'funny turns' the diagnosis is often made on clinical grounds alone without the aid of EEG. Ten percent of our EEG requests were on febrile seizures. EEG in children with febrile seizure appears to provide virtually no useful information, indeed, it may be quite misleading. It is considered that EEG had no place in the management of febrile seizures.¹⁴

Treatment of children with epilepsy extends far beyond the prescription of drugs and investigations. The treatment process should include management of the global health and daily functioning of the child from a physical, social, educational and psychological point of view.⁶ Kwong et al., in a questionnaire survey, showed that parents of children with epilepsy disclosed major misunderstandings of the disease and its treatment.¹⁵ Epilepsy remains a hidden disorder, even among children, with ignorance, prejudice, superstition, stigma and discrimination, and there is still room for changing people's attitudes towards children with epilepsy.¹⁶

The present study suggested that we could improve our patient management in better provision and documentation of parental education concerning side effects of drug. It also highlighted the false belief among clinicians that EEG was able to diagnose or exclude epilepsy. Practical advice and recommendations were required in the role and clinical relevance of EEG.

References

1. Anderson VE, Hauser WA, Rich SS. Genetic heterogeneity in the epilepsies. In: Delgado-Escueta AV, Ward Jr. AA, Woodbury DM, Porter RJ, editors. *Advances in neurology*, vol. 444. New York: Raven Press; 1986:1-66.
2. Hopkins A. Audit of the medical care of people with epilepsy. In: Chadwick D, ed. *Quality of life and quality of care in epilepsy*. Vol 23. London: Royal Society of Medicine, 1990: 40-9.
3. Webb DW, Coleman H, Fielder A, Kennedy CR. An audit of Paediatric epilepsy care. *Arch Dis Child* 1998;79:145-8.
4. Appleton R, Besag F, Kennedy C, Wallace S, Hopkins A. An audit of children referred with suspected epilepsy. *Seizure* 1998; 7:489-95.
5. Knudsen FU, Auk I. Clinical audit in the management of children with epilepsy. *Acta Paediatr* 2000;89:502-4.
6. Nicolaides P, Appleton RE, Beirne M. EEG requests in paediatrics: an audit. *Arch Dis Child* 1995;72:522-3.
7. George CF. What do patients need to know about prescribed drugs. *Prescribers' Journal* 1994;34:7-11.
8. Robinson RO, Edwards M, Madigan C, Ledger S, Boutros A. Audit of a children's epilepsy clinic. *Dev Med Child Neurol* 2000; 42:387-91.
9. Richens A, Perucca E. General principles in drug treatment of epilepsy. In: Laidlaw J, Richens A, Chadwick D, eds. *Textbook of epilepsy*. 4th ed. Edinburgh: Churchill Livingstone Communications, 1993.
10. Yang PJ, Berger PE, Cohen M, Duffner PR. Computed tomography and childhood seizure disorders. *Neurology* 1979; 29:1084-8.
11. Gibbs J, Appleton RE, Carty H, Beirne M, Acomb BA. Focal electroencephalographic abnormalities and computerized tomography findings in children with seizures. *J Neurol Neurosurg Psychiatry* 1993;56:369-71.
12. Berg AT, Testa FM, Levy SR, Shinnar S. Neuroimaging in children with newly diagnosed epilepsy. A community-based study. *Pediatrics* 2000;106:527-32.
13. Smith D, Bartolo R, Pickles M, Tedman BM. Requests for electroencephalography in a district general hospital: retrospective and prospective audit. *BMJ* 2001;322:954-7.
14. Camfield PR, Camfield CS. Management and treatment of febrile seizures. *Curr Probl Pediatr* 1997;27:6-14.
15. Kwong KL, Wong SN, So KT. A survey of parental perception, worries and needs in children with epilepsy. *Acta Paediatr* 2000; 89:593-6.
16. Kale R. Bringing epilepsy out of the shadows. *BMJ* 1997;315: 2-3.