Audit study on justifying anti-epileptic drug therapy in children with a first attack of unprovoked seizure

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Received 31 December 2019
Revised 30 January 2020
Accepted 02 February 2020
Published 20 November 2020

Journal of Current Medical Research and Practice
2020, 5:379–382

Background
According to the recent available guidelines and standards in the management of children with a first attack of unprovoked seizure, this study evaluates the practice of initiating anti-epileptic drug (AED) therapy in children.

Objective
The objective is to assess and improve the clinical practice, making treatment decisions more optimal and individualized.

Patients and methods
Clinical standards for initiating AED therapy in children with a first attack of unprovoked seizure were derived from a compilation of recent guidelines and management standards of the American Academy of Neurology, the Child Neurology Society, the International League Against Epilepsy, as well as other researches. Children presented to the outpatient neurology clinic with a first unprovoked seizure were assessed against derived standards in a 1-year audit through direct observation of clinical practice. Data were collected and transferred to computer software to be easily analyzed and reviewed, then expressed as tables, proportions, curves, and charts.

Results
A total of 43 children were included. Overall, 40 (93%) cases were adherent to recent clinical guidelines and standards. Thirty-two cases have started AED therapy appropriately, whereas three (7%) cases started AED inappropriately. Moreover, no case had an inappropriate decision of deferring AED therapy.

Conclusions
Adherence to standards was optimal in most of the studied cases. The result of assessment was satisfactory. The aim should be directed to keep updated and spread knowledge of best available standards and guidelines to optimize management and improve child's quality of life.

Keywords:
children, first, seizure, unprovoked

J Curr Med Res Pract 5:379–382

2357-0121

Introduction

Unprovoked seizures are seizures or a cluster of seizures, with recovery of consciousness in between, occurring within 24 h in a person older than one month of age in the absence of precipitating factors [1–3]. A first seizure in children raises urgent health and lifestyle issues, particularly the prognosis regarding seizure recurrence [4]. Recent studies have provided a much more accurate understanding of the overall risk of recurrence and have identified factors that affect this risk [5].

So, the decision as whether to treat children and adolescents who have experience a first unprovoked seizure should be based on a risk–benefit assessment that weighs the risk of having another seizure against the risk of chronic anti-epileptic drug (AED) therapy. This decision should be individualized and consider both medical issues and patient and family preferences [6–8] to optimize the quality of life [9].

This study was conducted to evaluate the management practice in outpatient neurology clinic of Assiut University Children Hospital, in comparison with best available evidences for management of a child with a first unprovoked seizure, particularly the question of initiating AED treatment following this first attack.

Patients and methods

Ethical approval

(1) The study was approved and monitored by the Medical Ethics Committee of Faculty of Medicine, Assiut University

(2) The investigators explained the steps and value of the research to all eligible participants. Those who agreed to be included in the study signed fully informed consent
(3) Confidentiality was maintained during all stages of the assessment.

Study design

All children aged more than 28 days up to 18 years presented to the outpatient neurology clinic with a history suggesting seizure for the first time were included in a 1-year audit (from February 2018 to January 2019).

Exclusion criteria

The following were the exclusion criteria:
(1) Children already diagnosed with epilepsy
(2) Children with a known immediate precipitating head trauma
(3) Children with previously diagnosed CNS infection or tumor
(4) Children with acute precipitating causes such as hypoglycemia
(5) Children diagnosed with febrile convulsions.

Clinical standards for initiating AED therapy, in children with a first attack of unprovoked seizure, were derived from a compilation of recent guidelines and management standards of the American Academy of Neurology [6], the Child Neurology Society [6], the International League Against Epilepsy [3], as well as other researches [4,5,7,10–12]. We defined the first seizure using the International League Against Epilepsy definition to include multiple seizures within 24 h with recovery of consciousness between seizures [3]. The cutoff point for status epilepticus as a seizure activity lasting more than 30 min is adopted.

Four criteria were applied to initiate AED after a first unprovoked seizure in children [3–7,10–12]: (a) electroencephalogram with epileptiform abnormalities, (b) remote symptomatic etiology [6], (c) abnormal neuroimaging (structural brain anomalies), and (d) seizure while asleep.

Twelve points (items) were derived from recent available clinical guidelines and standards [3,6,13], against which each case was assessed (Table 1).

The evaluation standards were divided into three categories with optimal adherence to each category shown in Table 2.

Data from the observed practice and interviews with the caregivers were collected and transferred to computer software to be easily analyzed and reviewed ensuring patient and stuff confidentiality. These data are expressed as tables, proportions, curves, and charts using Microsoft Excel 2016 software.

Table 1 Clinical evaluation standards for treatment of children after a first unprovoked seizure 'checklist' [3,6,13]

	History	Details
1	Developmental/school performance	
2	FH of epilepsy	
3	FH/H of febrile seizures	
	Seizure history	
4	First-hand witness	
5	Description (type)	
6	Duration	
7	Postictal behavior or affection	
8	Presence of fever	
9	Timing (day/night/sleep/awake)	
	Investigations	
10	EEG requested (and result)	
11	Brain imaging requested appropriately	
12	Lab tests requested appropriately	
	Total	
	Initiating treatment decision	
	Started after first attack	
	Appropriate to criteria	

EEG, electroencephalogram; FH, family history; H, history.

Table 2 Optimal adherence (needed in the audit) for each category and optimal total adherence

Category	Total points	Optimal adherence	Optimal adherence (%)
History	3	3	100
Seizure detailed history	6	≥5	≥83.3
Investigations	3	≥2	≥66.6
Total	12	≥10	≥83.3

Results

A total of 43 children were included in the audit ranging from 3 months to 13 years old.

Adherence of our management plan to the individual clinical evaluation standards for treatment of children after a first unprovoked seizure 'Checklist'

Results demonstrated that adherence to each separate item of evaluation was good in general with more than 90% of cases managed appropriately in relation to items supervised in Table 1.

History and interviews were given by the first-hand witness in 40 (93%) cases. The first unprovoked seizure was different in type and presentation with generalized tonic–clonic convulsions having the main type of presentation (20 cases, 47%). Family history of epilepsy was positive in 19 (44%) cases. Developmental delay was documented in 10 (23%) cases.

Degree of adherence of our management plan according to the proposed standards

The optimal adherence (≥10/12 point, 83%) to the evaluation standards was achieved in 42 (97.67%) cases of the 43 cases included. Cases with points more than or equal to 11/12 was reached in 40 cases. Thirty-one (93%) cases achieved maximal points of adherence to the evaluation standards.

Initiation of anti-epileptic drug in the studied cases according to the standard guidelines

Forty (93%) cases were adherent to clinical guidelines and standards for initiating AED therapy. Thirty-two cases have started therapy appropriately. Three (7%) cases started AED inappropriately, and no case had an inappropriate decision of deferring AED therapy (Fig. 1).

As shown in Fig. 2, 35 (81%) cases have started AED therapy in the study. Three (7%) of these are not adherent to recent clinical guidelines and standards. Eight (19%) cases did not started AED therapy, and all of them were appropriate.

Discussion

To assess and improve the treatment practice of the first unprovoked seizure in children presented to outpatient neurology clinic, a set of standards were derived from the recently published clinical guidelines and standards.

Although cases of first unprovoked seizures are more likely to be presented to the emergency department, the selection of neurology unit and its clinic was intended because improving practice in this unit can lead practice improvement in the whole hospital specially the emergency department by emphasizing the recent best evidences by a leading specialized staff. Another reasoning for selection of outpatient clinic is that almost all cases presented to the emergency room with or without this category of convulsions usually have unnecessary investigations and imaging as a routine, which makes evaluation of investigations appropriateness less significant in reflecting the knowledge of leader staffs and practitioners. Moreover, the results of the audit show a scientifically sound knowledge and practice, which can be reflected in emergency department practice. Sound knowledge from leading staffs are the cornerstone to generalized sound practice. Assessment of investigations in emergency department can be an area of interest in another audit.

A good point noticed during observation is that all cases in the pediatric neurology clinic are seen and/or reviewed by assistant lecturers not residents, and this may explain the significantly high adherence to standards which was reassuring and satisfying.

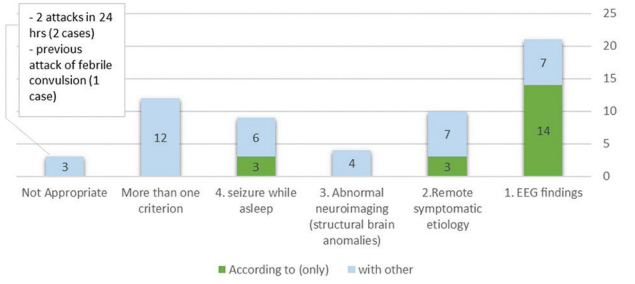
However, lack of documentation was a negative point in practice, and to overcome this in evaluation, the audit was made by direct observation in outpatient clinic followed by re-interviewing with informers and children's caregivers. The interviews had no effect on the observed clinical practice.

All the assessed area (history, seizure details, and investigations) have high adherence. The defects seen, and affected the decision of treatment, was in the seizure detail category. This may be, in part, explained by overcrowded clinic together with low educational level of some informers. The defect can be corrected by precise history taking and planning to manage overcrowding. No defect in knowledge about the international guidelines and standards was noticed. This appreciates the efforts made by the neurology staff members to follow the recent evidence-based knowledge. So, emphasis on these standards and spreading the knowledge become the objectives to improve the practice and to decrease the need of unnecessary treatment and investigations, which burden families and resources.

Financial support and sponsorship

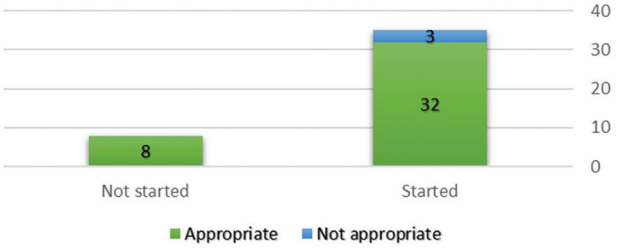
Nil.

Figure 1



Justifying initiation of AED therapy in studied cases after first unprovoked seizure according to standards. AED, anti-epileptic drug.

Figure 2



Number of cases started AED and appropriateness for initiation. AED, anti-epileptic drug.

Conflicts of interest

There are no conflicts of interest.

References

1 Hauser WA, Beghi E. First seizure definition and worldwide incidence and mortality. Epilepsia 2008; 49:8–12.

2 Beghi E, Carpio A, Forsgren S, Hesdorffer DC, Malmgren K, Sander JW, *et al*. Recommendation for a definition of acute symptomatic seizure. Epilepsia 2010; 51:671–675.

3 Fisher RS, Acevedo C, Arzimanoglou A, Bogacz A, Cross H, Elger CE, *et al*. A practical clinical definition of epilepsy (ILAE official report). Epilepsia 2014; 55:457–482.

4 Pohlmann-Eden B, Newton M. First seizure: EEG and neuroimaging following an epileptic seizure. Epilepsia 2008; 49:10–25.

5 Berg AT. Risk or recurrence after a first unprovoked seizure. Epilepsia 2008; 49:13–18.

6 Hirtz D, Berg A, Bettis D, Camfield C, Camfield P, Crumrine P, *et al*. Practice parameter: treatment of the child with a first unprovoked seizure. Report of the quality standards of the American Academy of Neurology and practice committee of the child neurology society. Neurology 2003; 60:166–175.

7 Shinnar S, Berg AT, O'Dell C, Newstein D, Moshé SL, Hauser WA. Predictors of multiple seizures in a cohort of children prospectively followed from the time of their first unprovoked seizure. Ann Neurol 2000; 48:140–147.

8 Marson A, Jacoby A, Johnson A, Kim L, Gamble C, Chadwick D. An immediate versus deferred antiepileptic drug treatment for early epilepsy and single seizure: a randomized clinical trial. Lancet 2005; 365:2007–2013.

9 Polmann-Eden P, Beghi E, Camfiled C, Camfield P. The first seizure and its management in adults and children. BMJ 2006; 332:339–342.

10 Wiebe S, Téllez-Zenteno FJ, Shapiro M. An evidence-based approach to the first seizure. Epilepsia 2008; 49:50–57.

11 Stroink H, Brouwer OF, Arts WF, Greets AT, Peter AC, van Donselaar CA. The first unprovoked, untreated seizure in childhood: a hospital-based study of the accuracy of the diagnosis, rate of recurrence, and long-term outcome after recurrence. Dutch study of epilepsy in childhood. J Neurol Neurosurg Psychiatry 1998; 46:595–600.

12 Kim LG, Johnson TL, Marson GA, Chadwick DW. Prediction of risk of seizure recurrence after a single seizure and early epilepsy: further results from the MESS trial. Lancet Neurol 2006; 5:317–322.

13 Hirtz D, Ashwal S, Berg A, Bettis D, Camfield C, Camfield P, *et al*. Practice parameter: evaluating a first nonfebrile seizure in children. Report of the quality standards subcommittee of the American Academy of Neurology, the Child Neurology Society, and the American Epilepsy Society. Neurology 2000; 55:616–623.