

Traditional Antiepileptics Remain First Line Treatment for Children with Epilepsy at The University Hospital of the West Indies, Kingston, Jamaica

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ABSTRACT

Objectives: To describe the demography of epilepsy in children at the University Hospital of the West Indies and to review the frequency of major seizure types and antiepileptic drug therapy used at diagnosis.

Methods: The records of all children ages two months to 12 years with two or more unprovoked seizures, on at least two separate days between January 2001 and December 2005 at the paediatric in-patient unit and paediatric neurology clinic were reviewed. Descriptive analyses (Chi-squared tests) were performed utilizing the Statistical Programme for Social Sciences (SPSS version 14). Statistical significance, $p < 0.05$.

Results: Sixty-three children were enrolled in the study; thirty-two (50.8%) were males. The median (minimum, maximum) age was 35 (2, 144) months at seizure onset. N (65%) had focal seizures of which dyscognitive seizures were the most frequent subtype. Generalized tonic clonic and myoclonic seizures were the most frequent of the generalized seizures. Nineteen (30%) children had more than one seizure type and 17 (27%) of the children were diagnosed with an epilepsy syndrome. West syndrome was the commonest of the epilepsy syndromes. Carbamazepine was the most frequently prescribed drug at initial diagnosis for focal seizures. Valproic acid was the drug of choice for generalized seizures.

Conclusion: There was no sex predilection in epilepsy in this population. Focal seizures were commonest and Carbamazepine was the choice drug for focal seizures and Valproic acid for generalized seizures.

Keywords: Epilepsy, focal seizures, generalized seizures, seizures

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INTRODUCTION

Epilepsy is one of the more common brain disorders in childhood (1). The prevalence of epilepsy in childhood is reported to be higher in developing countries (1). In Jamaica, the prevalence of epilepsy was reported as 5.8 per 1000 in 2–9 year-old children (2) which is closer to the prevalence in the United States of America (USA) of 6.3 per 1000 children (3) and Japan 5.3 to 8.8 per 1000 (4). The most common seizure types seen in paediatric epilepsy vary. In Turkey, the most common seizure types in the age group 0 to 18 years were generalized tonic-clonic seizures and focal seizures with secondary generalizations (5) whilst in Cuba and the USA in children younger than 15 years, focal and generalized seizures were the most frequently seen (6, 7).

Antiepileptic drug prescribing patterns also vary. In the developing nations of Africa, Carbamazepine and Phenobarbitone are the most frequently prescribed first line drugs (8). This was similar to Canada (9), whilst in three European countries Valproic acid and Carbamazepine were frequently prescribed (10). The distribution of seizure types amongst children in the Jamaican population is not known nor has antiepileptic drug prescribing pattern been documented. This study aimed to describe the demography of epilepsy in childhood at the University Hospital of the West Indies and to review the frequency of the major seizure types and antiepileptic drug therapy at diagnosis.

METHODS

This was a retrospective study of children aged two months to 12 years with epilepsy managed at the University Hospital of the West Indies between January 1, 2001 and December 31, 2005. The University Hospital of the West Indies is a tertiary level hospital located in Kingston, the capital of Jamaica and accepts referrals from medical facilities island-wide. At the time of the

study, only children age 12 years and younger were being registered as new patients in the Paediatric Department. A case was defined as a child age two months to 12 years with two or more unprovoked seizures on at least two separate days managed and followed-up at the University Hospital of the West Indies. Children with provoked seizures, febrile seizures and seizures on-going from the neonatal period were excluded. The records of all children ages two months to 12 years presenting with two or more unprovoked seizures on at least two separate days between January 2001 and December 2005 at the paediatric neurology clinic and paediatric in-patient unit of the University Hospital of the West Indies were reviewed. These children were identified by reviewing the admission registers in the paediatric medical wards and the paediatric neurology clinic registration log book using the search terms – fits, seizure, seizure disorder, convulsions and epilepsy. From this patient population, study cases fulfilling the case definition were selected. The diagnoses were confirmed by consultation with the paediatric neurologists. Data were extracted from the medical record and entered on to a data extraction sheet. Information on the demographics, seizures types in each patient and treatment were collected. Descriptive analyses (Chi-squared tests) were performed utilizing the Statistical Programme for Social Sciences (SPSS version 14). Statistical significance was taken at $p < 0.05$. Ethical approval for the conduct of the study was obtained from The University of the West Indies/University Hospital of the West Indies Ethics Committee of the Faculty of Medical Sciences, University of the West Indies Mona.

RESULTS

Hospital records of 63 children were reviewed; thirty-two (50.8%) were male. The median (minimum, maximum) age of onset of seizures was 35 (2, 144) months. There was no significant sex difference in the age at onset.

Seizure/ epilepsy types

At initial presentation, 41 (65 %) patients had focal seizures (Table 1). Twenty-four (38%) patients had dyscognitive seizures, 11 (17%) patients had focal seizures evolving to bilateral convulsive seizures and six (10%) had focal seizures without impairment of awareness (Table 1).

Table 1: Frequency of seizure types and antiepileptic drugs at initial presentation in children ages two months to 12 years with Epilepsy at University Hospital of the West Indies

Seizure types and drugs	N (%)
Focal seizures	41 (65)
Dyscognitive seizures	24 (38)
Focal seizures evolving to bilateral convulsive seizures	11 (17)
Focal seizures without impairment of Awareness	6 (10)
Generalized seizures	22 (35)
Myoclonic	7 (11)
Generalized tonic-clonic	6 (10)
Generalized tonic	4 (6)
Absence	4 (6)
Generalized clonic	1 (2)
Drugs prescribed at initial presentation	
Carbamazepine	26 (41.3)
Valproic acid	14 (22.2)
Phenobarbitone	6 (9.5)
Clonazepam	2 (3.2)
Prednisone	1 (1.6)

Twenty-two (35%) patients had generalized seizures. The most common types of generalized seizures were myoclonic and generalized tonic – clonic seizures in 13 (21%) patients. Nineteen (30%) patients had more than one seizure type. Eight (13%) patients had both focal and generalized seizures (Table 2). Seven (11%) patients with focal seizures later had generalized seizures. None of the patients with generalized seizures developed focal seizures later.

Table 2: Frequency of seizure types in two age groups and initial antiepileptic drug compared with seizure type of children with epilepsy at University Hospital of the West Indies 2001–2005

	Seizure types N (%)			<i>p</i> -value
	Partial	Generalized	Both	
Age (Months)				
< 36	9 (31)	14 (48.3)	6 (20.7)	0.006
> 36	24 (70.6)	8 (23.5)	2 (5.9)	
Drugs				
Carbamazepine	18 (69.2)	4 (15.4)	4 (15.4)	0.024
Valproic acid	5 (35.7)	9 (64.2)	0 (0)	0.021

Seventeen (27%) patients were diagnosed with an epilepsy syndrome. The commonest epilepsy syndrome identified was West syndrome which was diagnosed in 10 (16%) and self-limited epilepsy with centrotemporal spikes in six (10%). One (2%) patient had Lennox Gastaut syndrome. West syndrome was diagnosed at a mean (sd) age of 6.5 (4.4) months. The mean (sd) age at diagnosis of children with self-limited epilepsy with centrotemporal spikes was 96 (21.5) months. The patient with Lennox Gastaut syndrome was diagnosed at age five months. Twenty-nine

(46.0%) children were younger than 36 months. In this age group, 14 (48.3%) patients had generalized seizures, nine (31.0%) had focal seizures and six (20.7%) had both seizure types. Thirty-four (54%) patients were 36 months of age or older. In this age group, 24 (70.6%) had focal seizures, eight (23.5%) had generalized seizures and two (5.9%) had both seizure types. Generalized seizures were more frequent in children younger than 36 months old and focal seizures more frequent in children age 36 months and older ($p = 0.006$) [Table 2].

Antiepileptic drug therapy

The most frequently prescribed antiepileptic drugs at initial presentation were Carbamazepine in 26 (41.3%) patients and Valproic acid in 14 (22.2%) patients (Table 1). Carbamazepine was the drug most commonly prescribed for children with focal seizures and Valproic acid for children with generalized seizures. In patients who failed to respond fully to first line therapy or in whom there were abnormal laboratory results necessitating change to a second drug, the antiepileptic drugs commonly prescribed were Topiramate, Carbamazepine, Valproic acid and Clonazepam. Thirteen (21%) children failed to respond to the first prescribed drug and required a second drug.

DISCUSSION

This study was conducted in a tertiary referral institution in Jamaica, a middle developing country. Focal seizures were most common and occurred more frequently in children three years and older. The most common epilepsy syndromes were West Syndrome and self-limited epilepsy with Centrotemporal Spikes. Valproic acid and carbamazepine were the most commonly prescribed

antiepileptic drugs. In this study there was no sex predilection. Similar findings have been noted in other populations of Chile (11) and USA [Connecticut] (12). However, studies from Turkey (13), Lithuania (14) and Mississippi, United States have shown a male predilection (15). Previous data from other local studies have yielded conflicting results.

In the Jamaica cohort study of sickle cell disease, the investigators found that male gender was associated with an increased risk of developing epilepsy in children with sickle cell disease (16). The median age of onset of epilepsy was 36 months which is comparable to data published by Banu and colleagues who documented a median age of three years in children with epilepsy ages two months to 15 years in Bangladesh (17). The distribution of seizure types in our population is similar to published reports of other populations. In our population, focal epilepsy was diagnosed in 65% of the patients and generalized epilepsy in 35%. Dyscognitive seizures (previously called complex partial seizures) were the most frequent of the partial seizures whilst generalized tonic – clonic and myoclonic seizures were the most frequent in those with generalized epilepsy. Sillanpaa and colleagues similarly documented that focal seizures occurred in 64% of patients in children younger than 16 years in Finland (18). Focal seizures were also the most frequent seizure type noted in other studies in rural Kenya (19), Northern Sweden (20), Singapore (21) and the United States (7). There was a low prevalence of absence epilepsy in our population. In a Swedish study of school age children, absence seizures were present in 24.5% (20). The low prevalence of absence epilepsy in our population may be due to the lack of inclusion of adolescents older than age 12 years or failure of recognition by families and teachers. There was a significant association of age with seizure type in this study. Generalized seizures were more frequent in children younger than 36 months whilst focal seizures were commonest in children 36 months and older. A similar finding has been noted by Ogunlesi *et al* who reviewed the records of children aged six months to

three years managed at a paediatric neurology clinic in Nigeria. Generalized tonic - clonic seizures occurred in 55 (76.9%), complex partial seizures in eight (6.3%) and two (4.8%) patients had BECTS (22). Kong and colleagues documented generalized seizures as the most frequent seizure type in children in China younger than five years (23). Both authors cited perinatal factors as frequent causes of epilepsy in this age group. In this study, we found that an epilepsy syndrome was documented in 27% of the children. Epidemiological studies from Japan in 2006 documented epilepsy syndromes in 15% (4) and from Sweden in 49.4% (20). In our study, amongst children ages two to 15 months, West syndrome was the commonest epilepsy syndrome; and in the age group 72–120 months, self-limited epilepsy with centrotemporal spikes was the most frequent.

In a Spanish study, West syndrome was the more frequent epilepsy syndrome in infancy and self-limited epilepsy with centrotemporal spikes in school-aged children (24). In Sweden, self-limited epilepsy with centrotemporal spike was commonest overall (20). In our study, few other epilepsy syndromes were described. This may reflect under-recognition of these types due to reduced availability of EEGs or under-representation due to the sample size. Carbamazepine was the drug of choice for treatment of children with focal seizures and valproic acid for the treatment of generalized seizures in our study. This was comparable to other international studies where conventional antiepileptic drugs are still the drugs of first choice despite the presence of newer antiepileptic agents. In a European study, conducted in 2005 which included three countries, Italy, Netherlands and the United Kingdom, valproic acid and carbamazepine were the drugs most frequently prescribed for children with epilepsy 0 to 11 years (10). Similarly, Tan *et al* documented in 2009 that valproic acid was the most frequently prescribed drug to treat epilepsy in children from Singapore despite the availability of newer drugs (25). Carbamazepine was noted to be the drug of choice for treatment of focal seizures and valproic acid for primary generalized

seizures in the USA in a 2010 report (26). Epilepsy in this population of Jamaican children affects males and females equally. Focal epilepsy is the commonest subtype and infantile spasms is the most frequently recognised epilepsy syndrome. Carbamazepine and valproic acid are the preferred drugs for children with epilepsy at initial diagnosis. This study was retrospective and data were missing for a few variables. Despite this, we found that epilepsy in childhood in Jamaica at the University Hospital of the West Indies is similar in seizure types and the epilepsy syndromes represented to reports from other countries. The pattern of antiepileptic drug therapy is similar to that in developing countries.

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Conflict of interest

We wish to confirm that there are no known conflict of interest as it relates to the publication of this paper, there was no financial support for this work that would influence its outcome.

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Some families with young children, suffering from severe seizures, have moved to one of the 22 states where medical marijuana use is legal. Charlotte's Web is a strain of cannabis bred to contain high levels of CBD, a part of the plant showing promise against seizures. It is named after a child whose convulsions dropped from more than 300 a week to 2-3 a month with this treatment. Many of those with epilepsy find that their seizures develop in response to specific triggers. This is the case for people with photosensitive epilepsy. Learning how to avoid situations and stimuli that could spark a seizure can be very helpful. Some children may learn to avoid using video games in dark rooms, for example, or to cover one eye when exposed to flashing lights. Epilepsy is the most common childhood brain disorder in the United States. Nearly 3 million people have been diagnosed with this disease, while 450,000 of them are under the age of 17. Fortunately, two thirds of the child population will overcome the side effects, most notably, seizures, through treatment during adolescence. Epilepsy affects all ages groups. But for children, a variety of issues exist that can affect one's childhood.