

## Original articles

# School drop out and fallout from idiopathic epilepsy in rural Sri Lanka

A C D De Alwis<sup>1</sup>, S H Kariyawasam<sup>2</sup>, C Weerasinghe<sup>3</sup>

*Sri Lanka Journal of Child Health* 2008; **37**: 8-11

(Key words: School drop out, epilepsy, children, Sri Lanka)

## Abstract

**Aims** The purpose of the study was to assess the schooling status and the educational achievement of children with idiopathic epilepsy in rural Sri Lanka, and to evaluate the impact of some disease related factors on school achievement.

**Method** Thirty six children (24 boys, 12 girls) aged 6-16 years (mean age 10.72 years) with idiopathic epilepsy attending a clinic in rural Sri Lanka were studied. Their schooling status was recorded and the educational achievement was assessed by the standard school report and teacher assessment report for two subjects; first language and mathematics. Two sub groups of academic achievers and non-achievers were compared and the impact of some disease related factors such as gender, age at onset of seizures, duration of epilepsy, seizure type and anti-epileptic medication on academic achievement was evaluated by a statistical test.

**Results** School failure was seen in 21 (58%) out of 36 children. Five (13.8%) failed to attend school for a continuous period exceeding six months owing to epilepsy. The main reason for non-attendance was fear of occurrence of seizures. Academic under-achievement was observed in 16 (51.6%) out of 31 school-going children. School failure was seen in both subjects studied. Statistical analysis showed no impact of gender, age at onset of seizures, duration of epilepsy, seizure type and anti-epileptic medication on academic achievement.

**Conclusion** School drop out and fallout are significantly common among children with idiopathic epilepsy. It is important for the paediatrician, teacher and parents to keep an eye on school performance so that early remedial action can be taken.

<sup>1</sup>Consultant Paediatrician, General Hospital, Ratnapura, <sup>2</sup>Senior Lecturer in Pharmacology, Faculty of Medicine, Colombo, <sup>3</sup>Medical Officer, Cancer Institute, Maharagama.

(Received on July 17, 2007. Accepted on 20 August 2007))

## Introduction

Epilepsy is the most common neurological disorder in childhood, affecting approximately 0.5 -1 per cent of children<sup>1</sup>. The term 'idiopathic' is used, for epilepsy occurring without an identifiable, underlying neurological or metabolic disorder. In general, children with idiopathic epilepsy have a favourable medical prognosis with almost two thirds achieving seizure free status, thanks to the availability of a wide range of effective anti-epileptic medication<sup>2</sup>. However in childhood epilepsy, seizure control is not the only issue. It is well established that epilepsy is a complex disorder which has an impact on many aspects of a child's life like education, behaviour and emotional and social development. Though these have been well described among epileptic children in western countries, patients in rural societies of the third world may be equally or perhaps more adversely affected, as numerous mythical beliefs surrounding this ancient disease seems to haunt backward communities<sup>3</sup>.

Despite being the first township mentioned in the ancient Sri Lankan chronicle: 'Mahawamsa'. Mahiyangana remains a socio-economically and educationally backward rural region of Uva province of Sri Lanka. Consisting predominantly of a farming population, it is also the home of the 'veddhas'; the indigenous people, who still lead a primitive, hunter-gatherer life-style.

As the first permanent consultant paediatrician in Mahiyangana who conducted a sustainable clinic the first author noted the many challenges confronted by children with epilepsy within the school system. Talking to the patients and parents we also wondered whether deep rooted beliefs stigmatising children with epilepsy were adversely affecting the school performance.

The aim of the present study was to examine the schooling status and educational achievement of children affected by idiopathic epilepsy in Mahiyangana, and to evaluate the impact of some disease related factors on school underachievement.

## Patients and Methods

Thirty six children with idiopathic epilepsy aged between 6 and 16 years, attending the paediatric and medical clinics at Mahiyangana Base Hospital from March 1999 to April 2000 were included in the study. The cohort was predominantly male with 24 (66 %) boys and 12 (44 %) girls with a mean age of 10.72 years. Idiopathic epilepsy was diagnosed by a consultant paediatrician or neurologist based on history, physical examination, electroencephalographic (EEG) studies and, when indicated, neuroimaging. EEG studies and CT imaging were performed at Kandy and Badulla General Hospitals. Children with underlying neurological disorders such as cerebral palsy and neurocutaneous syndromes were excluded from the study.

The patient details regarding age, gender, age at onset and duration of epilepsy, seizure type and current anti-epileptic medication were obtained by interviewing the parents or carers and from the medical records.

Educational achievement was assessed by the standard school report issued by the department of education. The average of the grade or mark gained at the previous two term tests for first language and mathematics was obtained and categorised as follows; A or >75 = very good, B or 60-74 = good, C or 40-59 = average and D or <39 = poor. Whenever the school report was not available, the teachers were requested to submit an assessment report of the first language and mathematics based on the above scale. Children receiving a D grade or a mark below 40 were considered as under-achievers while those obtaining A, B or C grade or a mark above 40 were considered as achievers.

The data was statistically analyzed and the effects of variables of epilepsy i.e. age, gender, age at onset and duration of epilepsy, seizure type and anti-epileptic medication on academic achievement were assessed using Chi-squared test.

## Results

The frequency of seizure types in our cohort was as follows; *generalised*: 27 (75%) (tonic clonic 19, tonic 5, atonic 2, atypical absence 1) and *partial* 9 (25%) (simple partial 1, complex partial 4, complex partial with secondary generalisation 4).

Five (13.8%) children with idiopathic epilepsy were not attending school for a period exceeding 6 months at the time of recruitment to study. Patient characteristics and the reason attributed by them or their parents for not attending school are shown in table 1.

The remaining thirty one children were attending mainstream school and fifteen (48%) of them showed adequate or good school achievement obtaining a grade A, B or C or a mark above 40 for first language and mathematics at the previous two term tests. Sixteen (51.6%) showed poor school achievement either obtaining a grade D or a mark below 40 for the two subjects. Tables 2 and 3 show patient characteristics of school achievers and under-achievers.

The main features between the achiever and non-achiever groups are compared in table 4. Statistical analysis showed no relationship between academic achievement and gender, age at onset, seizure type, duration of epilepsy and anti-epileptic medication.

**Table 1**  
**Patient characteristics of school non-attenders (n=5)**

Age (years)	Gender	Age at onset (years)	Seizure type	Duration of epilepsy (years)	Treatment
07	F	03	GA	04	VPA
12	F	11	GTC	01	VPA
13	F	06	CPS	07	CBZ
16	M	15	CPSSG	02	CBZ
16	M	02	CPSSG	14	VPA

*GA Generalised Atonic, GTC Generalised Tonic Clonic, CPS Complex Partial Seizure, CPSSG Complex Partial Seizure with Secondary Generalisation, VPA Valproate, CBZ Carbamazepine,*

**Table 2**  
**Patient characteristics of school-achievers (n = 15)**

Age (years)	Gender	Age at onset (years)	Seizure type	Duration of epilepsy	Treatment
11	M	11	GT	1 year	CBZ
07	F	07	GTC	6 months	VPA
12	M	10	GT	2 years	CBZ
08	M	08	GTC	4 months	VPA
07	M	03	GTC	4 years	VPA
09	F	05	GT	4 years	CBZ
11	M	11	GTC	4 months	CBZ
16	M	10	GTC	6 years	CBZ
12	M	11	GT	1 years	CBZ
13	F	10	GTC	3 years	PHE
15	M	05	GTC	10 years	PB
12	M	12	SPS	3 months	CBZ
15	M	15	GTC	3 months	CBZ
10	M	10	CPS	3 months	CBZ
09	M	09	GTC	4 months	CBZ

*GT Generalised Tonic, GTC Generalised Tonic Clonic, SPS Simple Partial Seizure, CPS Complex Partial Seizure, CBZ Carbamazepine, VPA Valproate, PHE Phenytoin, PB Phenobarbitone,*

**Table 3**  
**Patient characteristics of school underachievers (n = 16)**

Age (years)	Gender	Age at onset (years)	Seizure type	Duration of epilepsy	Treatment
8	F	4	GTC	4 years	CBZ
8	M	7	GTC	1 year	CBZ
10	M	9	GT	1 year	CBZ
12	F	11	CPSSG	3 months	CBZ
13	M	12	GA	1 year	VPA
13	M	9	CPS	4 years	VPA
16	M	14	GTC	2 years	PHE
16	F	14	GTC	2 years	CBZ
12	F	11	GATyAb	4 months	VPA
10	M	7	CPS	3 years	CBZ
11	F	7	CPSSG	4 years	VPA
7	M	4	GTC	3 years	PB
7	M	3	GTC	4 years	PB
6	M	3	GTC	3 years	PB
10	M	3	GTC	7 years	PB
6	F	4	GTC	2 years	PB

*GTC Generalised Tonic Clonic, GT Generalised Tonic, CPSSG Complex Partial Seizure with Secondary Generalisation, GA Generalised Atonic, CPS Complex Partial Seizure, GATyAb Generalised Atypical Absence, CBZ Carbamazepine, VPA Valproate, PHE Phenytoin, PB Phenobarbitone,*

**Table 4**  
**School-achievers and non-achievers compared**

	<b>Educational achievers (n=15)</b>	<b>Educational underachievers (16)</b>
Mean age (years)	11.13	10.31
<b>Gender</b>		
Male	12	10
Female	03	06
Mean age at onset (years)	09.13 (SD 2.98)	07.6 (SD 3.80)
Mean duration of epilepsy (years)	02.26 (SD 2.69)	02.56 (SD 1.76)
<b>Type of seizure</b>		
<i>Partial</i>		
Simple Partial	01	-
Complex Partial	01	02
Complex Partial with Secondary		
Generalisation	-	02
<i>Generalised</i>		
Atypical absence	-	01
Tonic clonic	09	09
Tonic	04	01
Atonic	-	01
<b>Anti-epileptic medication</b>		
Sodium valproate	03	04
Carbamazepine	10	06
Phenobarbitone	01	05
Phenytoin	01	01

## Discussion

In our study, school failure was seen in 21 (58%) out of 36 children with idiopathic epilepsy. Five (13.8%) children failed to attend school for a continuous period exceeding six months and 16 (51.6%) out of the remaining 31 schooling children were academic underachievers. Though the school failure rate in our cohort appears to be high, similar rates have been noted by other investigators. Sturniolo and Galletti (1993) observed that 61% of Italian schoolchildren with idiopathic epilepsy had poorer academic progress than expected by their IQ level and in one third of them it was severely impaired<sup>4</sup>. Dutch study of epilepsy in childhood (DuSECh) (2003) revealed that despite similar intelligence and educational background 51% of children with idiopathic epilepsy required special educational assistance, compared with 27% of healthy control subjects<sup>5</sup>. Nigerian investigators observed that the mean school grades of adolescents with epilepsy is significantly lower than are those of their healthy controls<sup>6</sup>.

A significant finding of the present study was that five (13.8%) children with idiopathic epilepsy were not attending school for a long period of time. School drop out has been previously reported by Silenpaa et al (1998)<sup>2</sup> and they have noted that though all children with uncomplicated epilepsy had completed a primary

education, only half were successful at secondary school.

All five of our children attributed their school non-attendance to epilepsy. Two adolescents had stopped schooling due to fear of occurrence of seizures, and a 7 year old was refused admission to grade one because of epilepsy. Genuine concerns over safety of epileptic children in the classroom and playground, lack of competence in first aid measures to tackle seizures, dearth of transport facilities to the nearest hospital in case a child develops a seizure and scarcity of rapid communication methods in this rural setting might have contributed to the decision of not including an epileptic child in school. Benedetti et al have previously reported fear of seizures among a group of Italian junior school teachers<sup>7</sup>. We also speculate that certain mythical beliefs might have aggravated the situation. An Indian study has revealed that a significant proportion of parents think that children with epilepsy are insane and not fit to attend school<sup>8</sup>. Though these beliefs were not directly expressed by our parents, it is a matter for further exploration in a larger public awareness study. In a study, which included school children and teachers, a significant proportion of the Sri Lankan public harbours mythical beliefs about epilepsy<sup>9</sup>. We are happy to note that with adequate control of epilepsy, education of parents and teachers about first aid measures to be taken in seizures and by providing educators with more

elaborate information about epilepsy all five children were successfully incorporated back to school.

In our study, academic underachievement was seen in almost half (51.6%) of epileptic school-going children. Previous studies show similar rates and also suggest that school failure is much more common in epilepsy than in other chronic illnesses like asthma<sup>10</sup>. Studies also show that poor school achievement is seen in all subject areas<sup>4</sup>. In our study too, low grades and marks were observed for both first language and mathematics.

Factors contributing for school underachievement are multiple and yet to be fully understood. Disease related factors such as early onset seizures, long duration of epilepsy<sup>6</sup>, partial onset seizures, partial seizures with secondary generalisation<sup>11</sup>, and adverse effects of medication<sup>12</sup> have been implicated by some authors. Psychosocial factors like stigma, the child feeling different to others, overprotection, lack of awareness by the parents and teachers<sup>10</sup> have been attributed by others. We could not show a statistically significant relation of gender, age at onset, seizure type, duration of epilepsy and anti-epileptic medication to academic under-achievement. Though statistically insignificant, probably due to small sample, it was noteworthy that five (5/16) children with idiopathic epilepsy on phenobarbitone were found in the academic underachiever group when compared to one (1/15) in the achiever group. Phenobarbitone is known to have a long term adverse effect on cognition<sup>12</sup>. In all five patients we managed to substitute phenobarbitone with an alternative antiepileptic drug with a lesser impact on learning.

Our study highlights that school dropout and academic under-achievement is significantly common among children with idiopathic epilepsy. Hence, it is extremely important for the paediatrician in the clinic to be aware that managing epilepsy is not only control of seizures, but delving deeper into important aspects like behaviour and learning. Our concerns need to be conveyed to parents and teachers so that a close eye can be kept on the school functioning of the child. Teachers need to be aware that regular assessment and early intervention are required to maximise an epileptic child's school achievement. Parents and teachers also need to be made aware that not only the disease, but surrounding psychosocial factors like stigma and the way we look after the child may affect the educational outcome.

#### Acknowledgements

We thank all principals and teachers of schools in Mahiyangana for the help extended to us by forwarding assessment reports and providing access to standard school reports.

#### References

1. Hauser W A, Annegers J F, Anderson V E. Epidemiology and the genetics of epilepsy. In: Ward A A, Penry J K, Purpura D, editors. *Epilepsy*. New York: Raven Press, 1983: 267–94.
2. Sillanpää M, Jalava M, Kaleva O, Shinnar S. Long-term prognosis of seizures with onset in childhood. *N Engl J Med*. 1998; **338**:1715–22.
3. Malhi Prahbjot, Singhi Pratibha. Correlates of quality of life with epilepsy. *Indian J Pediatr* 2005; **72** (2): 131-5.
4. Sturniolo M G, Galletti F. Idiopathic epilepsy and school achievement. *Arch Dis Child*. 1994; **70**(5):424-8.
5. Oostrom K J *et al*. Not only a matter of epilepsy: early problems of cognition and behaviour in children with "epilepsy only"—a prospective, longitudinal, controlled study starting at diagnosis. *Pediatrics* 2003; **112**:1338–44.
6. Adewuya A O, Oseni S B, Okeniyi J A. School performance of Nigerian adolescents with epilepsy. *Epilepsia*. 2006; **47**(2):415-20
7. Benedetti P, Galletti F *et al*. Perception of epilepsy in a group of Italian school teachers. In: *Epilepsy and Society: Realities and Prospects* - Elsevier Science Publishers, 1988:95-7
8. Gambhir S K, Kumar V, Singhi P D, Goel R C. Public awareness, understanding and attitudes towards epilepsy. *Indian J Med Res* 1995; **102**: 34-8.
9. Senanayake N, Abeykoon P, Epilepsy in Sri Lanka: public awareness and attitudes. *J Trop Med Hyg*. 1984; **87**(2):61-6.
10. Joan K. Austin, M. Shelton Smith, Michael W. Risinger, Angela M. McNelis (1994) Childhood Epilepsy and Asthma: Comparison of Quality of Life. *Epilepsia* **35** (3), 608–15.
11. Pestana E M, Sardinias N, Trujillo C. Influence of epilepsy-related factors on scholastic achievement in an epileptic child, *Rev Neurol*. 1997; **25** (137):44-7.
12. Sulzbacher S, Farwell J R, Temkin N, Lu A S, Hirtz D G. Late cognitive effects of early treatment with phenobarbital. *Clin Pediatr (Phila)* 1999; **38** (7):387-94

