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

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(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.

Introduction

Epilepsy is the most common neurological disorder in childhood, affecting approximately 0.5 -1 per cent of children¹. 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 medication². 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 communities³.

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.

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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 year               | 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

|                      | Educational achievers (n=15) | Educational underachievers (16) |
|----------------------|------------------------------|---------------------------------|
| Mean age (years)     | 11.13                        | 10.31                           |
| Gender               |                              |                                 |
| 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)                 |
| Type of seizure      |                              |                                 |
| Partial              |                              |                                 |
| Simple Partial       | 01                           | -                               |
| Complex Partial      | 01                           | 02                              |
| Complex Partial with Secondary | -                          | 02                              |
| Generalisation       | -                            |                                 |
| Generalised          |                              |                                 |
| Atypical absence     | -                            | 01                              |
| Tonic clonic         | 09                           | 09                              |
| Tonic                | 04                           | 01                              |
| Atonic               | -                            | 01                              |
| Anti-epileptic medication |                        |                                 |
| 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. 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. Nigerian investigators observed that the mean school grades of adolescents with epilepsy is significantly lower than are those of their healthy controls.

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) 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. 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. 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. 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. Studies also show that poor school achievement is seen in all subject areas. 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, partial onset seizures, partial seizures with secondary generalisation, and adverse effects of medication 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 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. 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.

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