Behavioral Problems of Epileptic Children at Queen Sirikit National Institute of Child Health

Vinadda Piyasil MD*,
Somjit Sriudomkajorn MD*, Janwanpen Suwanpairat MD*

** Queen Sirikit National Institute of Child Health, Department of Medical Services, College of Medicine, Rangsit University, Bangkok*

Background: *Neurological diseases and psychiatric problems were cloudily related. Many patients with epilepsy had associated problems such as Learning disorders(LD) or Attention deficit hyperactivity disorder (ADHD). Evaluation and treatments of these behavioral and learning problems should be, therefore, included in management of patients with epilepsy in order to improve their quality of life.*
Objective: *To study behavioral, learning problems that indicate ADHD in epileptic children.*
Material and Method: *These was cross sectional study in 100 epileptic children, age 6-11 years old who visited Neurological Clinic at Queen Sirikit National Institute of Child Health. The patients were assessed with Thai Youth Checklist (TYC), IOWA screening test for ADHD and questionnaires concerning learning area. The data was analyzed in Chi-square, using SPSS program.*
Results: *The prevalence of behavioral problems in epileptic children was 57 percent. The prevalence of moderate to severe ones which should be treated and related to complex partial seizure was 32 percent. The prevalence of learning problems was 23 percent. Most were found in higher classes. The prevalence of behaviors that indicate ADHD was 23 percent from TYC and 58 percent from IOWA screening test for ADHD. There was relationship of behaviors that indicate ADHD and the severity of epilepsy. The prevalence of delinquent behavior was 24 percent and social problems were 32 percent respectively.*

Correlation of behavioral problems and social skills ($p = 0.027$), good manner toward parents ($p = 0.015$) and helping house chores ($p = 0.016$) were significantly different. However, there was no significantly different between behavioral problems and age of onset as well as duration of epileptic symptom, frequency of seizures in the past 6 months, EEG results and combination of medication.
Conclusion: *The epileptic children had high risks of behavioral and learning problems; they may be prevented by intensive evaluation, proper interventions, adequate counseling, proper medication, parental training and proper rehabilitation.*

Keywords: *Epilepsy, Behavioral and learning problems*

J Med Assoc Thai 2008; 91 (Suppl 3): S9-14
Full text. e-Journal: *http://www.medassocthai.org/journal*

The prevalence of behavioral problems in epileptic children was 5 times more than normal population[1]. And also higher than other non-neurological chronic diseases such as asthma or diabetes. These behavioral problems may be direct results of brain dysfunctions, medical drug used or environment. More behavioral problems in the patients with poor discipline, low socioeconomic group and parents who had psychiatric problems were examples of environmental influence.

Epilepsy affected the patients and also their families[2]. Seizures were dreadful for everyone and parents were usually in a panic especially when they did not know how to deal with. Their parents were more likely to care for the patients differently from other children. The patients themselves, especially in generalized seizure type, were usually over anxiety and feel powerless during seizure attack their children.

Correspondence to: Piyasil V, Queen Sirikit National Institute of Child Health, Bangkok 10400, Thailand.

It was believed that limbic system especially temporal lobe effected in epilepsy. The involved neurotransmitters were dopamine, norepinephine (NE) and serotonin which resulted in the patients' labile mood, poor concentration and free-floating anxiety. Incidentally, the suicide rate was high in these patients, especially in the ones who took drugs irregularly or over dosed.

The medication for control epilepsy usually had side effects on behavior and learning. Side effects of phenobarbital were restless, hyperactivity and over anxiety especially in young children. High doses of phenytoin could cause confusion and disturbance of the learning process. Carbamazepine, and primidone could cause sleepy, short attention, poor concentration, nervous, confusion and disorientation. Especially phenobarbital and phenytoin effect directly to intelligence, learning process and hyperactivity.

Attention deficit hyperactivity disorder (ADHD)[3] was neuropsychiatric disorder, found 3-5 percent in school age children and more in epileptic children. The prevalence of male to female was 4-6:1. Patients with ADHD have short attention span, impulsivity and hyperactivity. Recent evidences showed that the pathology was more likely caused by chemical substances deficit in the brain than anatomical defect. There was dysfunction in prefrontal cortex, cerebellum, corpus collosum and basal ganglia. Prefrontal cortex control executive functions were concentration, reasoning, planning, ordering and inhibition, etc., in addition, to basal ganglia controlled impulsivity.

Objective

To study behavioral problems, learning achievement, social skill and behaviors that indicate ADHD in epileptic children; to find the relationship between behavioral problems and the types of epilepsy, medication and the duration used.

Material and Method

The study was done from 1 June 2006 - 30 May 2007. One hundred epileptic children, age 6-11 years old who visited Neurological clinic at Queen Sirikit National Institute of Child Health were enrolled. All of them were studying at primary level.

Exclusive criteria were congenital abnormality, chromosomal abnormality or epilepsy resulted from intracranial infection, metabolic diseases or head injury.

The studied steps were as followings:

1. Selected the patients according to the inclusion criteria.

2. The researchers informed the parents about the project and its benefit.

3. The parents filled in the patients' personal data and screening tests as followed.

3.1 Personal data concerning epilepsy.

3.2 Thai Youth Checklist.

3.3 IOWA screening test for ADHD.

3.4 Screening test concerning learning problems.

4. The data was analyzed comparing epileptic children with behavioral problems and epileptic children without behavioral problems. Risk factors were identified.

5. The data was analyzed in Chi-square test using the SPSS program.

Thai youth checklist: TYC

The test was developed from Thomas M Achenbach's Child Behavioral Checklist (CBCL). It covered all details about behavioral and emotional problems and has already been tested in the field. They were classified into two major groups, which were internalizing and externalizing behavior.

The answer "no" was 0 point, occasional was 1 point and frequent was 2 points. The points were added up and compared with normal children at the same age and sex. Analysis was done to find the relations between the behaviors and psychiatric problems and identified risk factors. The patients were classified into 4 groups: normal range, mild range, moderate and severe range (Table 1).

Psychiatric problems were divided into 3 groups. The first was internalizing behavior which was withdrawal, somatic complaint, anxiety and depression. The second was externalizing behavior which was delinquent and aggressive behavior and the third was neither high loading on internalizing and externalizing behavior which was social, thought and attention problems.

Table 1. Standard score from TYC

Total score at age 6-11 years		Severity of behavioral problems
Male	Female	
> 67	> 66	Clinical range
58-66	57-65	High-risk: moderate problem range
49-57	48-56	High-risk: mild problem range
≤ 48	≤ 48	Normal range

IOWA screening test for ADHD-short form

There were 5 questions concerning ADHD symptoms and 5 questions concerning oppositional defiant symptoms. They were 4 grades for the parents to decide according to the severity of the behaviors, The answer "no" was 0 point, occasional was 1 point, rather frequent was 3 points and very frequent was 4 points. The scores of 10 points or more was considered ADHD.

Test for learning problems

The test identified the ability to read, write, compute, analyze and the learning result from teacher. The results were considered lower than standard when there were lower in 3 aspects or more, compared with the other students in the class.

Results

General information

There were 100 epileptic children studied, 54 of them were male and 46 female. Seventy-nine percent from central region, 10 from northern region, 5 from southern region and 6 from eastern region. The range was 6-11 years old. There were 24 patients who were 11 years old which was the most common age group. The least common age group was 6 and 8 years old (10% each) (Fig. 1). There were 96 Buddhists among patients.

Twenty-four percent was in level 1 (Fig. 2). Eleven percent had history of fail an examination. They were 64 mothers, 23 fathers and 13 relatives. Forty-four percent finished secondary school, 40% finished primary school and 7.5% unknown.

Data concerning epilepsy

There were 58 patients with generalized seizure (45 with tonic and conic seizure, 11 with absences seizure and 2 patients with myoclonus seizure. Furthermore, there were 42 patients with partial seizure (5 with simple partial seizure and 37 with complex partial seizure).

The most common age of onset was 2 years old or under. The mean age of onset was 4.6 years old. The most common duration of seizure was 2 and 1 year which was 19 and 17 patients consecutively. The mean duration of seizure was 4.3 years (Fig. 3); 80% of patients had no seizure in the past 6 months. General physical examinations were normal. Eighty-nine percent had EEG done. Of which the result was normal in 45 percents of them. Fifty-five percent were abnormal EEG (39 with epileptic discharge).

There were 67 patients who recieved single antiepileptic drugs, 23 patients took two types and one patients who recieved 3 types of the drug respectively. The most common antiepileptic drugs were sodium valproate (43%) and carbamazepine (36%).

Data concerning behavioral problems

There were behavioral problems in 57% of the epileptic children, (male 30 and female 27) The problem ranges were high-risk: mild problem range 12%, High-risk: moderate problem range 13% and severe in clinical range 32%.

Of the 57 patients with behavioral problems, 14 patient (24.5%) were in the group of externalizing behavior, delinquent type and 43 patients (75.5%) were in the group of neither high loading on internalizing and externalizing behavior. In the second group, there were 18 patients (32%) who had social problems and 25 patients (44%) who attention problems.

There were 23 patients (16 male, 7 female) who had learning results lower than standard. There were 58 patient (male 38, female 20) who were classified

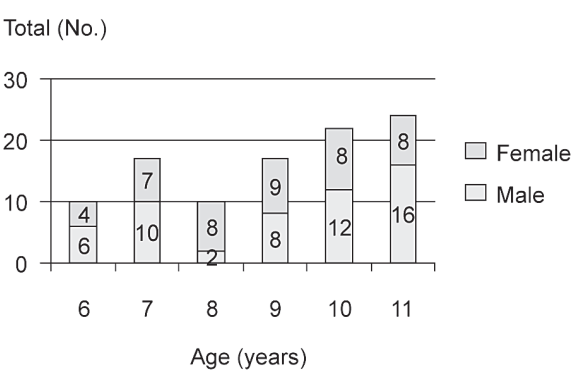

Fig. 1 Demographic data about age and sex of epileptic children

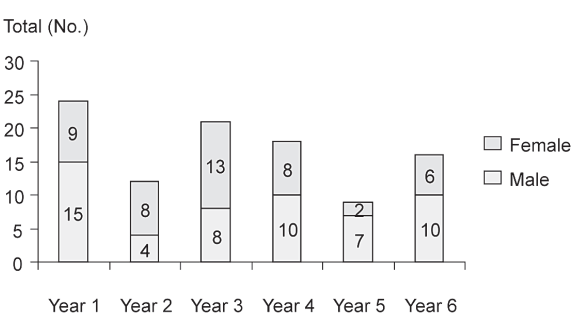

Fig. 2 Educational level of epileptic children

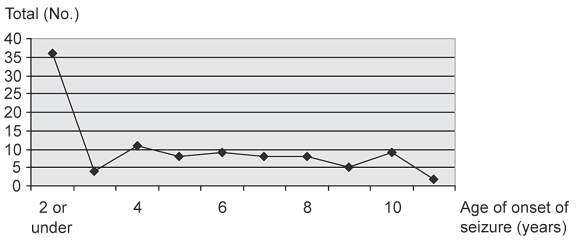

Fig. 3 Age of onset of seizure

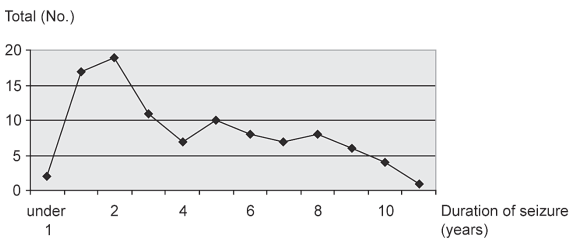

Fig. 4 Duration of seizure (years)

as ADHD by IOWA screening test.

Comparing risk factors with behavioral problem, there was correlated between behavioral problems and social skills (p = 0.027), good manner toward parents (p = 0.015) and helping house chores (p = 0.016) were significantly different. However, there was no significantly difference between behavioral problems and age onset as well as duration of epilepsy, frequency of seizure in the past 6 months, EEG result, combination of medicine taken, age and sex of the patients, parents' education level, hobbies, relations with siblings and learning results.

The patients with generalized tonic and conic seizure had less behavioral problems than other group and the ones with complex partial seizure had significantly more behavioral problems than other groups (p-value 0.017).

Discussion

The prevalence of psychiatric problems in children with chronic disease was double of the normal ones[6] Children and adolescents with epilepsy and adults with childhood-onset epilepsy often reported to have social maladjustment, including poor educational attainment, lower-than-expected occupational status, poorer perceived health and fitness, more frequently reported behavior problems, lower rates of marriage as adults and higher rates of social isolation at all ages[7].

The prevalence of emotional and behavioral problems in epileptic children was as high as 5 times of normal children. Psychiatric illness and epilepsy morbidity have a complex relationship. Epilepsy is associated with an increase risk of affective and psychotic disorders through a variety of mechanisms. The medications used to treat psychiatric disorders may trigger seizures and anti-epileptic drugs commonly have psychotropic adverse effects[8]. The prevalence of emotional and behavioral problems in epileptic patients was between 48-57 percents which was higher than other non-neurological chronic disease such as asthma or diabetes[7,8]. In this research we found behavioral problems in 57% of the epileptic children (male 30 and female 27). The problem range was high-risk: mild problem range 12%; high-risk: moderate problem range 13% and severe in clinical range 32%.

Emotional and behavioral problems which usually found in epileptic children were ADHD, learning disorders, mood disorder, psychosis and mental retardation[8,9]. Of the 57 patients with behavioral problems in this research, 14 patients (24.5%) were in the group of externalizing behavior, delinquent type and 43 patients (75.5%) were in the group of neither high loading on internalizing and externalizing behavior. In the second group, there were 18 patients (32%) who had social problems and 25 patients (44%) who attention problems. Learning disorders were reported lower than other study.

Underlying neurologic conditions may cause both symptoms of attention deficit hyperactivity disorder and epilepsy. But antiepileptic medications may affect attention and impulsivity, both positively and negatively, at least in some persons[7,8]. Children with epilepsy and low IQ have higher rate of significant behavior problems and mood disorders than those with normal IQ[8]. More likely, underlying neurological abnormalities explain the coexistence of low IQ, epilepsy and psychiatric abnormalities. Testing of groups of children with epilepsy using detailed neurocognitive batteries could demonstrate higher-than-expected rates of psychiatric condition.

Although behavioral problems was found in the group with externalizing problems behavior and the group with neither high loading on internalizing and externalizing behavior. They were not found in the groups of internalizing problems behavior such as withdrawal, somatic complaint, anxiety and depression. These may explain that the measurement was not sensitive enough to detect these problems.

The severity of behavioral problems was less in the patients with generalized tonic and clonic seizures than in the ones with complex partial seizures. Our study was in accordance with other studies[10-12] that one of the risk factors of behavioral problems was the severity of the seizures. However, there was no correlate between behavioral problems and age of onset of seizures, combination of antiepileptic drug and duration of epilepsy in our study which are difference from other papers.

Delinquent behavior and social problems was significantly higher in epileptic patients from this study. Behavioral disturbances may be due to family factors and parental anxiety about epilepsy, rather than a primary result of epilepsy or underlying neurological disorder[7,8]. We, therefore, believe that these patients should be stressed on training concerning social skills, respect to others, playing skill and helping house chores.

Screening the epileptic patients for the risk factors and early intervention were very important. It was easier to detect and help them in the younger age. We strongly recommend concomitant evaluation of learning problems, behavioral problems and psychiatric problems at the early stage of treatment of epilepsy. This will certainly improve their quality of life.

Social acceptance and inclusion of epileptic children are far from complete, even when seizures are infrequent or fully controlled. Some children are not sent to school if seizures are uncontrolled. All prejudices and stigmas may further impair social and academic function in epileptic children. Although the epileptic patients had high risks of behavioral and learning problems, they may be prevented by proper interventions, adequate counseling, proper medication, parental training and proper rehabilitation[11-14].

References

1. Haslam HA. Neurologic evaluation. In: Kliegman RM, Behrman RE, Jenson HB, Stanton BF, editors. Nelson textbook of pediatrics. 18th ed. Philadelphia: Saunders; 2008: 2433-5.
2. Johnston MV. Seizure in childhood. In: Kliegman RM, Behrman RE, Jenson HB, Stanton BF, editors. Nelson textbook of pediatrics. 18th ed. Philadelphia: Saunders; 2008: 2457-73.
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 4th ed. (DSM IV). Washington, DC: American Psychiatric Association; 1994: 63-5.
4. Cantwell DP. Attention deficit disorder: a review of the past 10 years. J Am Acad Child Adolesc Psychiatry 1996; 35: 978-87.
5. Rutter M, Graham P, Yule W. A neuropsychiatric study in childhood (Clinics in Development Medicine, 35/36). London: Spastic International Medical Publication; 1970: 58-76.
6. Graham P, Turk J, Verhulst F. Child psychiatry: a developmental approach. 3rd ed. London: Oxford University Press; 1999: 326-30.
7. Wendy GM, Van Hirtum-Das M. Behavioral, cognitive and social aspects of childhood epilepsy. In: Swaiman KF, Ashwal S, Serriero DM, editors. Pediatric neurology: principle & practice. 4th ed. Philadelphia: Mosby; 2006: 1171-80.
8. Manford M. Practical guide to epilepsy. Burlington: Butterworth-Heiemann; 2003: 289-304.
9. Pellock JM. Psychiatric comorbidity in children and adolescents with epilepsy. Medical College of Virginia. Available from: http://www.vcu-cme.org/cns/jpellock_abs.html
10. Kugoh T. Quality of life research in adults with epilepsy in Japan. Clin Ther 1998; 20(Suppl A): A48-57.
11. Freilinger M, Reisel B, Reiter E, Zelenko M, Hauser E, Seidl R. Behavioral and emotional problems in children with epilepsy. J Child Neurol 2006; 21: 939-45.
12. Keene DL, Manion I, Whiting S, Belanger E, Brennan R, Jacob P, et al. A survey of behavior problems in children with epilepsy. Epilepsy Behav 2005; 6: 581-6.
13. Harden CL, Maroof DA, Nikolov B, Fowler K, Sperling M, Liporace J, et al. The effect of seizure severity on quality of life in epilepsy. Epilepsy Behav 2007; 11: 208-11.
14. Dunn DW, Austin JK. Differential diagnosis and treatment of psychiatric disorders in children and adolescents with epilepsy. Epilepsy Behav 2004; 5(Suppl 3): S10-7.

ปัญหาพฤติกรรมของผู้ป่วยเด็กโรคลมชัก ณ สถาบันสุขภาพเด็กแห่งชาติมหาราชินี

วินัดดา ปิยะศิลป์, สมจิต ศรีอุดมขจร, จันทร์วันเพ็ญ สุวรรณไพรัตน์

ภูมิหลัง: *โรคระบบประสาท และปัญหาทางจิตเวชมีความสัมพันธ์กันอย่างใกล้ชิด เช่น เด็กที่เป็นโรคลมชัก อาจมีปัญหาการเรียน มีโรคสมาธิสั้น หรือ ความบกพร่องในทักษะการเรียน (learning disorder)ร่วมด้วย ดังนั้น การตรวจวินิจฉัยที่ครอบคลุมทั้งปัญหาของโรคลมชัก ปัญหาพฤติกรรม อารมณ์ ปัญหาด้านการเรียน และให้การรักษาไปพร้อมกันจะช่วยทำให้คุณภาพชีวิตของผู้ป่วยเด็กโรคลมชักดีขึ้น*

วัตถุประสงค์: *เพื่อศึกษาผู้ป่วยเด็กโรคลมชัก ในรายละเอียด ศึกษาถึงปัญหาพฤติกรรม ผลสัมฤทธิ์ด้านการเรียน ความสามารถในการปรับตัวเข้าสังคมและพฤติกรรมที่บ่งชี้ถึงโรคสมาธิสั้น และหาความสัมพันธ์ของปัญหาพฤติกรรมกับรายละเอียดของโรคลมชักเพื่อหาความเสี่ยง*

วัสดุและวิธีการ: *เป็นการศึกษาแบบ cross sectional study ศึกษาในผู้ป่วยเด็กโรคลมชักอายุ 6-11 ปี จำนวน 100 ราย ที่มารักษาที่คลินิกประสาทวิทยา สถาบันสุขภาพเด็กแห่งชาติมหาราชินี สร้างแบบเก็บข้อมูลพื้นฐานของโรคลมชัก และใช้แบบสำรวจพฤติกรรมเด็ก (Thai Youth Check list: TYC) แบบคัดกรองพฤติกรรมที่บ่งชี้ถึงโรคสมาธิสั้น แบบสอบถามเกี่ยวกับการเรียน วิเคราะห์ข้อมูลด้วยคอมพิวเตอร์ โปรแกรม SPSS วิเคราะห์โดยใช้สถิติ Chi-square*

ผลการศึกษา: *พบปัญหาพฤติกรรมในผู้ป่วยเด็กโรคลมชักร้อยละ 57 อยู่ในระดับรุนแรงสมควรได้รับการรักษาร้อยละ 32 ซึ่งกลุ่มนี้มีความสัมพันธ์กับลักษณะการชักแบบ complex partial seizure พบปัญหาด้านการเรียนร้อยละ 23 และพบเพิ่มขึ้นในชั้นเรียนที่สูงขึ้น พบพฤติกรรมที่บ่งชี้ถึงโรคสมาธิสั้นร่วมด้วยกับโรคลมชักร้อยละ25 จากแบบสำรวจพฤติกรรมเด็ก (TYC) และร้อยละ 58 จากแบบคัดกรองพฤติกรรมที่บ่งชี้ถึงโรคสมาธิสั้น และพบความสัมพันธ์ของพฤติกรรมที่บ่งชี้ถึงโรคสมาธิสั้น กับปัญหาพฤติกรรมระดับรุนแรง พบพฤติกรรมผิดปกติในกลุ่ม delinquent behavior และ social problems คิดเป็นร้อยละ 24 และ 32 ของผู้ป่วยที่มีปัญหาพฤติกรรมตามลำดับ*

พบความสัมพันธ์ระหว่างปัญหาพฤติกรรมกับ ความสามารถในการเข้ากับเด็กอื่น ๆ (p-value = 0.027) การปฏิบัติตนต่อพ่อแม่ (p-value = 0.015) และความขยันทำงานบ้าน (p-value = 0.016) ซึ่งมีความแตกต่างกันอย่างมีนัยสำคัญทางสถิติ แต่ไม่พบความสัมพันธ์ระหว่างปัญหาพฤติกรรมกับอายุที่มีการชักครั้งแรก จำนวนปีที่เป็นโรคลมชัก ความถี่ของการชักใน 6 เดือนที่ผ่านมา ผล EEG และจำนวนชนิดของยากันชักที่ได้รับ

สรุป: *เด็กที่เป็นโรคลมชักมีความเสี่ยงที่จะเกิดปัญหาพฤติกรรม ปัญหาการเรียนได้มาก จึงควรป้องกันโดยการประเมินรอบด้าน ให้การวินิจฉัยและช่วยเหลือให้เร็ว ปรับการใช้ยากันชักที่เหมาะสม ฝึกอบรมพ่อแม่ในการเลี้ยงดู และกระตุ้นพัฒนาการ รวมถึงการฟื้นฟูสมรรถนะ*