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Clinical profile of childhood focal epilepsies in Jordan

Ürdün'de çocukluk çağı fokal epilepsilerin klinik profili

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Abstract
The present study was done in order to obtain a baseline profile of childhood focal epilepsies. Subjects included in this study were children suffering from focal epilepsy with age above 2 years who attended the Pediatric Neurology Clinic in Queen Rania Hospital for Children in Jordan. The data were obtained: age, sex, detailed of seizures type, age at first unprovoked seizure, family history of seizures, history of febrile seizures, etiological, socioeconomic class, additional neuro-impairment, electroencephalography (EEG) and brain imaging finding and the use of antiepileptic drugs, the results were recorded for further study. A total of 100 cases of focal epilepsy were enrolled in the study, 59 were male. Simple partial type recorded in 48%, simple partial with secondary generalization in 17% and complex partial seizure in 35%. In partial onset seizures the peak age was between 11-14 years and complex partial seizures between ages 6-10 years. Twenty-six patients had a family history of epilepsy, 91% of low socioeconomic class. Thirteen % of cases have history of febrile seizures, while symptomatic epilepsy was found in 48%. Twenty-five children had hypoxic-ischemic encephalopathy. The most common neurological impairment was learning difficulties with 35%. EEG was normal in 20% and mono-therapy was used in 68% and 33% had bad control (intractable). The pattern of focal epilepsies in our country do not differ from that of developed countries, identifying the etiology is important to plan prevention.
Keywords: Complex partial seizure; epilepsy; simple partial seizure

Özet
Bu çalışma, çocukluk çağı fokal epilepsilerin bazal profilini ortaya koymak için yapıldı. Bu çalışmaya katılan olgular, Ürdün'de Kraliçe Rania Çocuk Hastanesi Pediatrik Nöroloji Kliniği'ne başvuran 2 yaş üzeri fokal epilepsili çocuklardı. Yaş, cinsiyet, nöbet tipinin detayı, ilk uyarılmamış nöbet yaşı, nöbetlerin aile hikayesi, febril nöbetlerin hikayesi, etyolojik, sosyoekonomik sınıf, ilave nörolojik bozukluk, elektroensefalografi (EEG) ve beyin görüntüleme bulguları, ve antiepileptic ilaç kullanımı verileri toplandı, sonuçlar daha ileriki çalışma için kaydedildi. Bu çalışmaya total 100 fokal epilepsili vaka alındı, bunların 59'u erkekti. Basit parsiyet tip %48'inde, sekonder generalizeli basit parsiyel %17'inde ve kompleks parsiyel nöbetler %35'inde kaydedildi. Parsiyel başlangıçlı nöbetlerin pik yaptığı yaş 11-14 idi ve kompleks parsiyel nöbetler 6-10 yaşları arasındaydı. Yirmi altı hastada epilepsinin aile hikayesi vardı, %91'i düşük sosyoekenomik sınıftandı. Hastaların %13'ünde febril nöbet hikayesi varken semptomatik epilepsi %48'inde vardı. Yirmi beş çocuk hipoksik-iskemik ensefalopatiliydi. En yaygın nörolojik bozukluk %35 ile öğrenme güçlüğü idi. EEG %20'inde normaldi ve %68'inde monoterapi kullanıldı ve %33'ünde kötü kontrol (tedaviye cevap vermeyen) vardı. Bizim ülkemizde fokal epilepsilerin şekli gelişmiş ülkelerdekinden farklı değildir, etyolojinin belirlenmesi önleme planı için önemlidir.
Anahtar kelimeler: Kompleks parsiyel nöbet; epilepsi; basit parsiyel nöbet

Introduction

Study of the prevalence of epilepsy from the developing world has shown prevalence rates of 2-25 times higher than the prevalence rate of 5-6 per 1000 in developed countries (1).

The etiology of localization-related epilepsy is highly dependent on the age of onset. In all age groups, the etiology cannot be determined in more than half (55-89%) of all individuals with epilepsy (2).

Partial epilepsy constitutes 55.8%, 44% had generalized epilepsy and 0.2% had epilepsy undetermined whether focal or generalized (3). It was reported the important criteria for diagnosing idiopathic partial epilepsies in childhood which include absence of neurological or intellectual deficit, family history of epilepsy, onset after 18 months of life and seizures are usually brief with a good response to treatment (4). On the other hand, etiologically symptomatic partial epilepsy in children includes diverse causes or may occur without any obvious definable causes (5).

The present study was conducted to obtain a baseline profile of focal epilepsies in children who are of regular visit at pediatric neurology clinic or admitted to Neurological Department of Queen Rania Al-Abdullah Hospital for Children.

Patients and methods

Subjects included in this study were children suffering from active focal epilepsy with age above 2 years. They were attending Pediatric Neurology Clinic or from the in-patient services of Neurology Department, Queen Rania Hospital for Children in Jordan. The study included children with ages ranging from 2-14 years. The following data were obtained by pediatric specialist: age, sex, detailed of seizures type, frequency (number of seizures in the last month), type (focal or focal with secondary generalization), aura, ictus description, post-ictus state, age at first unprovoked seizure, family history of seizure disorders, history of febrile seizures, etiological factors, socioeconomic class, history of consanguinity, additional neuro-impairment, the type of Antiepileptic drugs used (mono therapy versus poly therapy).

Partial epilepsy was define as condition characterized by at least two or more seizures that were unprovoked by any immediate identifiable cause (1). Diagnosis of epilepsy was made from the history (including the

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clinical description of epileptic events), neurological examination and supplement with electroencephalography (EEG) findings. Definitions and principles of the International League against Epilepsy (ILAE) Commission on Classification and Terminology and the Commission on Epidemiology and Prognosis were used (6).

Idiopathic focal epilepsy patients were defined by age-related onset, particular clinical and EEG characteristics, and presumed genetic etiology (6), while remote symptomatic referred to epilepsy in the presence of a neurological abnormality, a history of brain insult, or a disorder associated with an increased risk of epilepsy that was presumed to be etiologically related to the child's epilepsy and cryptogenic referred to epilepsy in which there was no identifiable underlying etiology and the form of epilepsy was not one of the specific idiopathic syndromes (7).

Results

A total of 100 consecutive cases of epilepsy with partial seizure were enrolled in the study of which 59 were male with ages ranged from 2 to 14 years. Simple partial seizure was the commonest partial seizure recorded (48%), followed by complex partial seizure (35%), while simple partial with secondary generalization found in 17%.

Table 1. Distributions of seizure according to age in childhood focal epilepsy.

Seizure type	2-5 years No	6-10 years No	11-14 years No	**Total** No
1-Simple Partial	14	11	23	48
2-Complex partial	11	15	9	35
3-Partial with secondary generalization	4	6	7	17
Total	29	32	39	100

In partial onset seizures the peak age was between 11-14 years and complex partial seizures plateau was seen between ages 6-10 years. The distribution of age for different seizure types is given in Table 1.

Table 2. Age of onset regarding type of seizure.

Age of onset	Simple partial No (%)	Complex partial No (%)	Partial with secondary generalization No (%)	Total No (%)
< 1 year	14	9	4	27
1-3	9	7	2	18
4-5	6	3	2	11
6-10	12	9	7	28
11-14	7	7	2	16
Total No (%)	48	35	17	100

In complex partial the frequency of auras was 90% and the epigastric aura was the commonest with 23% of patients automatisms were detected. The age of onset is found to be 27% before the age of 1 year, between 1-3 years for 18%, 4 to 5 years 11%, 6-10 years 28% and between 11-14 years 16% (Table 2). The most vulnerable age for the onset of seizure ranged is less than one year.

Family history of epilepsy was reported in 23% of our cohort and 13% of cases have history of febrile seizures. In 52% the etiology was idiopathic while in 48% was symptomatic. Of the symptomatic epilepsy with identifiable etiology; 25 children had hypoxic-ischemic encephalopathy and 5 children had developmental central nervous system (CNS) malformations. Other causes were: post meningitis/encephalitic squeal, neuro-metabolic/neurodegenerative disorders while congenital infection and head trauma were less frequent. EEG was done for all patients. Twenty % of them were normal (Table 3).

Table 3. Type of EEG abnormality in partial seizure groups.

EEG recorded	No
Asymmetrical background	11
Multifocal sharp waves	13
Abnormal background with sharp wave	12
Sharp wave alone and location :	23
Frontal	6
Temporal	9
Occipital	3
Partial	5
Generalized slow wave	13
Partial with secondary generalization	8
Total	80

In most of epileptic patients at least one accessory neurological impairment, the most common were learning difficulties 30%, cerebral palsy 23% and mental retardation 6% (Table 4).

Table 4. Neurological deficit in childhood epilepsy.

Epilepsy associated neurological deficit	No
Learning difficulties	30
Cerebral palsy	23
Mental retardation	6
Speech disorders	7
Development delay	6
Visual effect	1

Regarding response to treatment of patients receiving treatment (22%) had a good control, 45% fair control and (33%) had bad control (intractable). Abnormal computer tomography (CT) results were found in 28% while 72% were normal. Brain atrophy was the commonest abnormal CT finding (18%), 5% had temporo-parietal post encephalitic and 5% had cerebral infarction.

Normal magnetic resonance imaging (MRI) results were recorded in 75% of cases and abnormal results were recorded in 25% and atrophic changes were the most common finding.

Discussion

On the basis of records from pediatric neurology clinic and department, this study has provided important baseline information on the types of focal epilepsies and associated developmental problems.

Epilepsy onset in our series occurs mainly in infancy (32%), the authors attributed this to the high percentage of brain immaturity with poor ability of the brain to protect itself from abnormal electrical discharges and to the higher incidence of risk factors at that age including perinatal complications, CNS infections, head trauma and metabolic disorders. While incidence of childhood onset epilepsy (30%), similar to what has been repeatedly reported everywhere (5).

As in prevalence studies of epilepsy most incidence studies find the disorder to be more common in males than females (8), in the present study the relationship between incidence for boys and girls which less than other (9).

In general, it was postulated that partial epilepsies comprise slightly over 50% of all epilepsies and accounts for about 40-50% of childhood epilepsy and 90% of epilepsy in adults (10). In the present study, partial epilepsy with secondary generalization was the least frequent type of localization-related epilepsy (17%) compared to simple partial epilepsy (48%) and complex partial seizure (36%). Symptomatic group represented 39% of our localization-related group of patients and this is consistent with many studies where it was formed 30% (11).

Familial occurrence of epilepsy ranged from 5-35% in several studies (12), it is considered a risk factor of epilepsy (13) and it has long been assumed that genetic factors play a role in epilepsy (5). In contrast to other studies where majority did not have family history; 23% of our cohort had family history of epilepsy (6).

Febrile seizures precede epilepsy in 10 to 15% of children. Little is known about the specific types of epilepsy associated with febrile seizures (14). In the present study history of febrile seizure was presented in 13% of cases, most of which were simple febrile seizures which is closed to other reports in which Seventy-three children with epilepsy; (13.9%) of them had a history of febrile seizures (9).

Co-morbid conditions are common in children with epilepsy; some may even overshadow epilepsy (14), the reported prevalence of these disabilities in children with epilepsy varies depending on how the conditions are ascertained and defined and whether estimates are derived among incident or prevalence of epilepsy (1), it is well known that mental retardation, speech disorders and specific learning disorders are more common in people with epilepsy than in general population (15), in recent study 23% of cases are epilepsy associated with cerebral palsy which is closed to other report (1), several investigations including this report, have observed high frequencies of additional neurological deficits in children with epilepsy regard mental retardation and cerebral palsy (9).

In our study, it was showed that 30% of cases have learning disabilities. Several epidemiologic studies have indicated that about half the children with epilepsy will have some schooling difficulties (16). It was reported the frequent occurrence of autistic behave in children and adolescents with epilepsy was (32%) (17). In our study, the figure is less than this, but it is closed to other report 7.1% (9).

We recorded idiopathic epilepsies as a commonest etiology in 53.5% of children that is closed to other report (18), while other reported symptomatic epilepsy was the commonest etiology (61%) (19). Idiopathic focal epilepsies are the most frequent epilepsy syndromes in children. They have an age-dependent course and might occur in more than one family member. Response to antiepileptic drugs is usually satisfactory but it is unclear whether treatment changes the outcome.

Primary diagnosis of epilepsy is clinical but EEG plays major role in evaluating epilepsy, recognized that normal routine EEG does not exclude the diagnosis of epilepsy. In the present study, EEG were performed in all patients of these 20% were normal while other reported abnormal findings in 61% (7). EEG which is either slow background found in 8% of cases while epileptic activity is found in 49%, other reported 34% of cases had abnormal background activity (19).

It was reported that the most reliable EEG abnormalities are the focal spikes or sharp wave discharges over the frontal or temporal lobes (20). The authors postulated that the frontal and temporal foci are highly epileptogenic in greater than 85% of individuals.

Our study showed that MRI detected abnormal findings in 25%. The incidence of abnormal MRI findings in this study correlates fairly with what had been mentioned in the literature (21).

Once the seizure type and epilepsy syndrome have been determined, an antiepileptic drug can be appropriately selected (15).

After the era of widespread of poly-therapy for treatment of epilepsy, it is now widely accepted that most of cases of newly diagnosed epilepsy in adult or children can be control with single antiepileptic drug (22). Although anticonvulsant poly-therapy has been widely and traditionally used in the treatment of epilepsy, there is little evidence of its advantages over mono-therapy and in the event of failure of optimum mono-therapy, the value of poly-therapy is not yet clear (23). Generally children with focal epilepsies are relatively refractory to treatment than those with generalized epilepsies, this was in agreement with our results, as most of our patients receiving treatment were either fairly controlled (45%) or bad control (33%). A fact that was supported by many authors who added that focal epilepsies in

children secondary to a known focal lesions are more refractory than these without identified abnormality (24).

The results of this study proposed the need for long-term population epidemiological studies. Motor and language deficits, mental deterioration and learning problems were represented in a relatively high percentage of children with focal epilepsy. MRI was the most valuable neuro-imaging examination to detect lesions. Furthermore, this knowledge will facilitate early educational intervention and multidisciplinary therapeutic and rehabilitation approaches.

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