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Baseline Profile of Childhood Focal Epilepsies in Jordan

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BASELINE PROFILE OF CHILDHOOD FOCAL EPILEPSIES IN JORDAN

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ABSTRACT

Objective: The present study was done in order to obtain a baseline profile of childhood focal epilepsies.

Materials & Methods: Subjects included in this study were children suffering from focal epilepsy with age above two years, who attended the pediatric neurology clinic in Queen Rania Hospital for children in Jordan. The information obtained included age, sex, details of seizures types, age at first unprovoked seizure, family history of seizures, history of febrile seizures, etiological factors, socioeconomic class, additional neuroimpairment, antiepileptic drug history, electroencephalography and brain imaging findings.

Results: A total of 100 consecutive cases of epilepsy were enrolled in the study. 59 were male. 48% of recorded were simple partial, 17% simple partial with secondary generalization had and 35% complex partial seizures. Peak age for onset of seizure for simple partial type was between 11-14 years, and for complex partial seizures it was between ages 6-10 years. 26 patients reported a family history of epilepsy. 91% belonged to low socioeconomic class. 13% of cases had a history of febrile seizures, while 38% were symptomatic. 25 children had hypoxic-ischemic encephalopathy. The most common neuroimpairments were learning difficulties and cerebral palsy. Electroencephalography was normal in 20%. Monotherapy was used in 68%. And 33% had bad control (intractable).

Conclusion: The pattern of focal epilepsies in our country does not differ from that of developed countries. Identifying the etiology is important to plan prevention.

Keywords: simple partial seizure, epilepsy, complex partial seizure

INTRODUCTION

Studies describing prevalence of epilepsy from the developing world have shown prevalence rates 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].

55.8% had partial epilepsy; 44% had generalized epilepsy, and 0.2% had undetermined epilepsy whether focal or generalized[3]. It was reported the important criteria for diagnosing idiopathic partial epilepsies in childhood include absence of neurological or intellectual deficit, family history of epilepsy, onset after 18 months of life and usually brief seizures 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 done to obtain a baseline profile of focal epilepsies in children regularly visiting pediatric neurology clinic or are admitted in the neurology services of Queen Rania AL-Abdullah hospital for children.

Table 1: Distribution of seizure according to frequency

Seizure type	2-5 years	6-10	11-14	Total
Simple Partial	14	11	23	48
Complex partial	11	15	9	35
Secondary generalized	4	6	7	17
Total	29	32	39	100

Table 2: Age of onset regarding type of seizure

Age of onset	Simple partial (%)	Complex partial (%)	Complex with secondary generalization (%)	Total (%)
< 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

MATERIALS & METHODS

Subjects included in this study were children suffering from active focal epilepsy with ages ranging between 2-14 years. They were attending pediatric neurology clinic or were under in-patient services of neurology department Queen Rania Hospital for Children in Jordan. The information obtained by pediatric specialist included age, sex, details of seizures type, frequency (number of seizures in the last month), type (focal or focal with secondary generalization), aura, ictus description, postictal state, age at first unprovoked seizure, family history of seizure disorders, history of febrile seizures, etiological factors, socioeconomic class, history of consanguinity, additional neuroimpairment, and type of antiepileptic drugs used (monotherapy versus polytherapy).

Partial epilepsy was defined as a 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 clinical description of epileptic events, neurological examination supplement with electroencephalography

findings.

Definitions and principles of the 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, particularly clinical and electroencephalography characteristics, and presumed genetic etiology[6]; while remote symptomatic referred to epilepsy in the presence of a neurological abnormality, 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 seizures were enrolled in the study of which 59 were male with ages ranging from 2 years up to 14 years. The commonest partial seizure type recorded was simple partial type (48%) followed by simple partial with secondary generalization (17%), and lastly by complex partial seizure (35 %).

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

In complex partial seizures the frequency of auras was 90%.

The age of onset is found to before one year for 27%, 1-3 years for 18 %, 4 to 5 years for 11 %, 6-10 years for 28 % and between 11-14 years for 16 % (Table 2). The most vulnerable age for the onset of seizures range was less than one year.

23% patients reported a family history of epilepsy. Most of our patients(91%) were of a low socioeconomic class. 13 % of cases have a history of febrile seizures.

Of the symptomatic epilepsy with identifiable etiology, 25 children had hypoxic-ischaemic encephalopathy, 5 children had developmental CNS malformations. Other causes such as postmeningitic/encephalitic squealae, neurometabolic/neurodegenerative disorders, congenital infection and head trauma were less frequent.

Electroencephalography was done for all patients. 20% of them were normal (Table 3). In most of epileptic patients there was at least one accessory neurological impairment. The most common were learning difficulties (30%), cerebral palsy (23%) and mental retardation (6%) (Table 4).

Regarding response to treatment of patients 22% had a good seizure control and 33% had bad control (intractable). Normal CT results were recorded in 72% and abnormal CT findings were recorded in 28%. Brain atrophy was the commonest (18%). 5% had post encephalitis and 5% had cerebral infarction. Normal MRI results were recorded in 75 cases and abnormal results in 25 cases. Atrophic changes were the commonest.

DISCUSSION

On the basis of records from the pediatric neurology clinic and admitted patients in the neurology service, 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 higher incidence of risk factors in this age including perinatal complications, CNS infections, head trauma and metabolic disorders.

Onset of epilepsy was in childhood was 30%. A finding clearly similar to what has been reported everywhere[8].

As in prevalence studies of epilepsy, most incidence studies find the disorder to be more common in males than females[9]. In the present study the relationship between incidence for boys and girls which less than other figures 10.

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[11]. 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 was (36%). Familial occurrence of epilepsy ranged from 5-35 % in several studies[12]. It

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

EEG recorded	Number
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

Table 4: Neurological deficit in childhood epilepsy

Epilepsy Associated neurological deficit	Number
Learning difficulties	30
CP	23
MR	6
Speech disorders	7
Development delay	6
Visual	1
Autistic	23

is considered a risk factors of epilepsy[13], and it has long been assumed that genetic factors play a role in epilepsy[5]. In the present study, it was shown that 23% of cases had family history of epilepsy, while others reported that a great majority of patients did not have a family history of epilepsy[6].

Febrile seizures precede epilepsy in 10-15% 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 present in 13% of the cases, most of which were simple febrile seizures which is close to other reports in which 13.9% of children with epilepsy had a history of febrile seizures[10].

Comorbid 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 from incident or prevalent cases 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 our study 23% of the cases of epilepsy are associated with cerebral palsy which is close to other reports[1]. Several studies, including this report, have observed high frequencies of additional neurological deficits in children with epilepsy such as mental retardation and cerebral palsy[10].

Our study showed that 30% of cases have learning disabilities. Several epidemiologic studies have indicated that about half the children with epilepsy will have some schooling difficulty[16]. Frequent occurrence of autistic behavior in children and adolescents with epilepsy (32%) has been reported[17]. In our study the figure is lesser than the aforementioned but it is closer to other reports 7.1%[10].

Most commonly the etiology was idiopathic that is close to other reports[18], while still others reported symptomatic epilepsy to be the commonest (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 electroencephalography plays major role in evaluating epilepsy. In the present study it was recognized that normal electroencephalography does not exclude the diagnosis of epilepsy. It was performed in all of patients of these 20% were normal, while others reported it to be in 61% cases 7. Abnormal electroencephalography, which is either slow background, was found in 8% of cases while epileptic activity was found in 49% which compared to other reports of 34% of cases having abnormal background activity[19]. It was reported that the most reliable EEG abnormalities were 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 (67%). The incidence of abnormal MRI findings in this study correlates fairly with what has been mentioned in the literature[21].
Once the seizure type and epilepsy syndrome have been determined, an antiepileptic drug can be appropriately selected[22].

After the era of widespread of polytherapy 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[23], Although anticonvulsant polytherapy has been widely and traditionally used in the treatment of epilepsy, there is little evidence of it having advantages over monotherapy. And in the event of failure of optimum monotherapy, the value of poly-therapy is not yet clear[24]. 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 (44%) or had 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 those without identified abnormality[25].

CONCLUSION

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 neuroimaging study to detect lesions. Furthermore, this knowledge will facilitate early educational intervention, multidisciplinary therapeutic and rehabilitation approaches.

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