
Risk factors and Neurological Disability Associated with Epilepsy in Iraqi Children

Adel A. Kareem
MBChB FICMS, CABP*

Tawfeeq F. R. AL-Auqbi
MBChB FICMS **

Abstract

Objective: To assess and describe the risk factors and neurological disability associated with epilepsy in children, in order to assist in early diagnosis and prompt management of epilepsy in children.

Method: a cross sectional (descriptive) study; carried out from 3rd Feb. 2008 to 28th Feb. 2010, on 185 children, in the Pediatrics Neurology Clinic / Neuroscience Hospital, Baghdad, Iraq. Children were studied as two age groups, pre-school age group 152 children, and school age group 33 children. The relations of risk factors and associated Neurological disabilities with epilepsy were studied among both groups and analyzed statistically.

Result: The male/female ratio was 1/0.73. The age range was 1 – 166 months with median of 36 month. Types of epilepsy were generalized 82.70% (153/185), about 95% of them were tonic- clonic seizure; the partial Epilepsy were 17.30% (32/185), about 96% of them was simple type. Electroencephalogram (EEG) findings as generalized, focal, hypsarrhythmia and normal were 79.45%, 17.29%, 0.021% and 0.016% respectively. Prevalence of risk factors in preschool age children was 62.5% (95/152) and in school age children was 51.5% (7/33). The probability of being epileptic at preschool age for those with risk factor was 62.45%. The probability of being epileptic at school age for those with risk factor was 51.45%. The most frequent risk factor encountered in pre-school children were the natal risk factors 58.9% (56/95), about 90% of these risk factors were birth Asphyxia, preterm delivery and Aspiration pneumonia; while in school age children the positive family history of epilepsy was the major risk factor 52.9% (9/17). The association of epilepsy with Neurological disability in preschool age group were 50.0% (76/152), mainly be as cerebral palsy (90%); while in the school age group were 12.12% (4/33) mostly be as learning and communication difficulties.

Conclusion: The risk factors for epilepsy and associated neurological disability were varied in its type and incidence according to the age of children.

Key words: epilepsy, risk factors, neurological disability

Introduction

Epilepsy affected approximately 5/1000 of children; but the children with central nervous system injury are at increased risk to development of childhood epilepsy.^[1] Neonates with seizures have a high incidence of mortality and adverse long-term neurologic outcomes,^[2] previous studies focus on a single or a limited number of maternal risk factors.^[3]

There are few studies examining clinical factors that predict the development of childhood epilepsy. About one third of the pediatric epilepsy population consists of children with cryptogenic localization related epilepsy. The term “cryptogenic” refer to a disorder whose cause is occult. It is presumed to be symptomatic, but the etiology is not known “localization-related” means that the seizure semiology or electroencephalogram findings during investigation disclose a localized origin of seizure.^[4]

Epilepsy refers to recurrent afebrile seizures and has been reported to occur in about 1% of population.^[5, 6] Seizures are a frequent presenting sign of hypoxic ischemic encephalopathy, asphyxia is usually an intrauterine event and hypoxia and ischemia occur together. Neurological sequels are expected in newborn with severe hypoxic-ischemic encephalopathy those remain comatose for more than a week.^[7]

Objectives

To assess and describe the risk factors and neurological disability associated with epilepsy in children, in order to assist in early diagnosis and prompt management of epilepsy in children.

Patient & Method

Setting

The study was designed as a cross sectional (descriptive) study; carried out for a two years period from Feb. 2008 to Feb. 2010, on 185 children, in the Pediatrics Neurology Clinic / Neuroscience Hospital, Baghdad, Iraq.

All patients and their families were informed about the aim and suspected benefit of the study before obtaining their agreements for participation according to the medical research and ethical regulations, thus an oral consent was taken from all enrolled participants and their families.

All the enrolled cases in the study were diagnosed as epilepsy according to the considered criteria of the following bases which adopted by Peter and Carol study (2009), consist of history of two unprovoked, unequivocal seizure, electroencephalogram and brain image findings.^[8] Diagnosis was made by the pediatric Neurologist(s) and sometime with

participation of neuromedicine specialist and all the children who fulfilled the diagnosis criteria were enrolled into the study. Moreover the International classification of epileptic seizures was depended for classification of epilepsy.

Inclusion criteria

- 1-Two or more unprovoked seizures
- 2-Age from one month to fifteen years

Exclusion criteria

- 1-Febrile convulsion
- 2-Neonatal seizure
- 3-Neurodegenerative brain disease
- 4-Equivocal seizures

A detailed history of the illness, development, pregnancy, birth and neonatal period, past medical illness family history were taken at presentation; moreover neurologic examination was carried out on each patient at presentation and this entailed assessment of consciousness speech, cranial nerves, cerebellar, motor and sensory function.

All the patients had electroencephalography and the finding were recorded neuroimaging was performed in most of them.

The following information was obtained from each patient and their families during the visits to the Pediatrics Neurology Clinic / Neuroscience Hospital:

- Age at first presentation.
- History of neonatal seizures.
- Gestational age, place of delivery and family history.
- Type of seizures outlined had been recording as partial and generalized.
- Risk factors were divided into preschool and school age risk factors.
- Associated neurological diseases were listed as preschool and school age associated neurological diseases

Statistical Analysis

Statistical analysis and reporting of obtained data were carried out by using Microsoft Excel - Windows XP professional program. Statistical tests were performed using a null hypothesis of no difference with a two-tails paired student t-test and Chi test; the

level of significance of P value was ≤ 0.05 , of high significance was ≤ 0.01 and of very high significance was ≤ 0.001 .

Result

The 185 epileptic children were 107 males and 78 females; male/ female ratio was 1/0.73.

The age range of participants was 1–166 months with median of 36 month; preschool age group were 152 (82.16%) of children and 33 (17.83%) were at school age group.

Types of epilepsy were distributed as following generalized type 82.70% (153/185), about 95% of them were tonic-clonic seizure; the partial epilepsy were 17.30% (32/185), about 96% of them was simple type.

Electroencephalogram (EEG) findings were generalized in 79.45% (147/185), focal in 17.29% (32/185), hypsarrhythmia in 0.021% (4/185) and normal EEG finding in 0.016% (3/185).

Risk factors for epilepsy were prevalent in preschool age children as 62.5% (95/152) and among the school age children as 51.5% (17/33). The probability of being epileptic at preschool age for those with risk factor was 62.45% and for those without risk factor was 37.55%. The probability of being epileptic at school age for those with risk factor was 51.45% and for those without risk factor was 48.55%. (Table-1)

The most frequent risk factor encountered in preschool epileptic children were the natal risk factors 58.9% (56/95), about 90% of these risk factors were birth Asphyxia, preterm delivery and Aspiration pneumonia; the second common risk factor among them was the positive family history 17.8% (17/95). Whereas in school age participant the positive family history of epilepsy considered as the major risk factor 52.9% (9/17). (Table-2)

The probabilities of epilepsy associated with neurological disability were 50.0% (76/152) at preschool age group and it is mainly come in forms as cerebral palsy (90%), the rest were speech delay and delayed millstone. While probabilities of epilepsy associated with Neurological disability at school age group were 12.12 (4/33) mostly came in forms of learning and communication difficulties. (Table-3)

Table-1: Risk factors among the pre-school and school age groups and probability of being epileptic.

	Pre-school age group		School age group		Total	
	No	Probability %	No	Probability %	No	Probability %
With risk factor	95	62.45	17	51.45	112	60.5
No risk factor	57	37.55	16	48.55	73	39.5
Total (n)	152	100	33	100	185	100

Table-2: Types of risk factors among pre-school and school age groups.

	Prenatal		Natal		Post-natal		Family History		Total	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Pre-school age group	6	6.3	56	58.9	16	16.3	17	17.8	95	100
School age group	1	5.8	6	35.2	1	5.8	9	52.9	17	100
Total	7	100	62	100	17	100	26	100	112	100

Table-3: Probability of Neurological disability associated with epilepsy among the pre-school & school age groups.

	Pre-school age group			School age group			Total		
	No	Probability	%	No	Probability	%	No	Probability	%
With neurological disability	76		50.0	4		12.12	80		43.95
No neurological disability	76		50.0	29		87.88	105		56.04
Total (n)	152		100	33		100	185		100

Discussion

We expect according to the clinical observation that age was important factor influencing the study of epilepsy; as far as there was quiet difference between two age groups regarding risk factors and associated neurological disease. About 82% of cases attended the pediatric neurological clinic were preschool age that gives idea about the prevalence of epilepsy is more in preschool age group; this finding was coincide with findings of Jallon study.^[9]

The prevalence of risk factors that may be related to epilepsy was 62.5% among preschool age children; while, in the school age group it was 51.5%. The probability of epilepsy at preschool age group with risk factor more than school age group, 62.45% v.s 51.45%; Njamshi study (2007) in Cameron found the probability of presence of risk factors among study group was 71.0% of participant.^[10]

About 39.5% of studied patients could not be associated with an identified etiological factor while other studies showed variety of finding such as Sridharan (1986) in Libya found 17.5% in his study,^[11] studies from industrialized countries like Jallon et.al. (1997) who found a specific etiology in 71.0% of cases at first epileptic seizure in the canton of Geneva;^[12] and Grainier et.al. (1983) who reported the etiological factor for 60.4% of his study group in Italy.^[13] This wide variation between studies to identify the etiological factors associated with the epilepsy might be attributed to the high standards of peri-natal health care and use of new and advanced technology in diagnosis and management of patients in European countries.

The dominant risk factor was different between participants of the two age groups, it is mostly perinatal in preschool group (58.9%) which is in forms of birth asphyxia and its sequel (90%), we noticed that asphyxia was very common and frequent

perinatal risk factor comparing with other studies such as the Beielmann study (1999) in Estonia,^[14] who found this risk factor prevalent in 14.38% of preschool children; this wide difference also supposed to be attributed to the difference in standard of perinatal health care provided in the two different studies. While those children at school age, the positive family history of epilepsy was the major risk factor to got epilepsy in 52.9% of cases, this result could be considered unusually fair as far as a lot of parents or relatives frequently deny a positive family for social and cultural causes, because they consider epilepsy as stigma for their families and they did not seeking medical help unless they consider it as a serious problem for which they need help. We notice that family history as risk factor for epilepsy in school age children varies considerably as following 63.4% in Cameron by Njamshi study (2007)^[10], about 36.6% by Singh study in India (1997)^[15] and 5.8% by Camara in Cameron (1997);^[16] However, it cannot yet be determined if these cases of epilepsy in families have a genetic character. Although, in the last decade several different chromosomal loci for common generalized epilepsies have been identified.^[17]

Association of epilepsy with neurological disability is a big problem at preschool children; about 50% of the group had such association which was mainly in form of cerebral palsy, about 90%; while Laguinju et. al. in his study (2006) found that 65% of children with cerebral palsy had established association with epilepsy.^[18] Furthermore, the association among school age children was low 12.12%; which was mainly in form of learning difficulties and communication disorder.

Despite of several difficulties in available treatment regimens of epilepsy we found, as the Dongmo et. al. study (2003), that a better

understanding of the risk factors in epilepsy is necessary for the improvement of the management of epilepsy and can be fruitful and possible.^[19]

Conclusion:

The risk factors and neurological disability associated with epilepsy were varied in its type and incidence according to the age of children.

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* Head of Pediatric Neurology Dept., Neurosciences Hospital, Baghdad - IRAQ.

**Head of Nutrition Dept., National Diabetes Center (NDC), AL-Mustansiriyah University, Baghdad - IRAQ.