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EPILEPSY IN CHILDREN WITH CEREBRAL PALSY IN MISURATA CENTRAL HOSPITAL, LIBYA

***Mohamed Abdelmalek, Maryem E. Ismail and Hala M. Shahout**

Department of Pediatrics, Lecturer, Faculty of Medicine, Misurata University, Libya
Pediatric specialist, Neurologist

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ABSTRACT

Objective: To describe the prevalence and characteristics of epilepsy in patients with cerebral palsy
Methods: A total of 50 consecutive patients with cerebral palsy were retrospectively studied. Criteria for inclusion were follow-up period for at least 2 years. Types and incidence of epilepsy were correlated with the different forms of cerebral palsy. Other factors associated with epilepsy such as age of first seizure, neonatal seizures and family history of epilepsy were also analyzed.
Results: follow-up ranged between 6 and 150 months (mean 57 months). The overall prevalence of epilepsy was 72%. Incidence of epilepsy was predominant in patients with quadriplegic and hemiplegic palsies: 92.5 % and 54.5 % respectively. First seizure occurred during the first year of life in 77.7% of patients with epilepsy. Generalized and partial were the predominant types of epilepsy (80.5 % and 19.5 %, respectively). Neonatal seizures and family history of epilepsy was associated with a higher incidence of epilepsy
Conclusions: Epilepsy in cerebral palsy can be predicted if seizures occur in the first year of life and in neonatal period and if there is family history of epilepsy.

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INTRODUCTION

Cerebral palsy (CP) is a chronic disorder of movement and posture. It is the result of a non-progressive damage of the immature nervous system caused by several factors1 that have occurred in prenatal, perinatal or postnatal periods2-5. It can manifest itself in several ways, mainly as spastic, athetoid and ataxic palsies; moreover, it is one of the most common causes of motor disability in children and frequently is associated with other problems, such as mental retardation, sensory defects and epilepsy6. The significance of epilepsy in patients with CP is discussed controversially in the literature. There are studies showing that epilepsy varies from 12 to ninety percent in children with CP7-11. Some authors argue that in certain types of CP occur higher rate of epilepsy6 and has been seen that about one third of the patients with CP exhibit seizures and this figure is proportional to the degree of motor and cognitive disabilities12,13.

Corresponding author:* **Mohamed Abdelmalek
Department of pediatrics, lecturer, Faculty of Medicine, Misurata University, Libya Pediatric specialist, Neurologist.

The present study aimed to describe the prevalence and characteristics of epilepsy in a population of patients with cerebral palsy.

MATERIALS AND METHODS

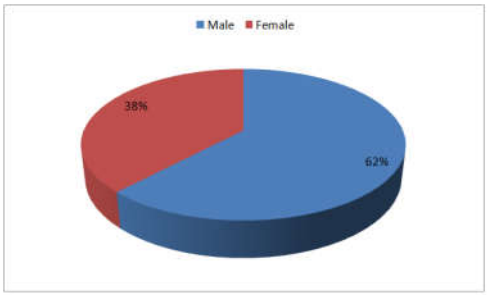
In a retrospective study were reviewed the charts of 50 consecutive patients with cerebral palsy evaluated between 2015 and 2016 in the Pediatric department of Misurata central hospital for at least 2 years. The following data were obtained: gender, gestational age (premature, matures, or post matures newborns), follow-up period in the service, age at manifestation of CP, types of CP, its etiology (prenatal, perinatal, postnatal or unknown), its degree of severity (very severe: when patients do not have any postural control; severe: can walk with maximum support or, in hemiplegic patients it does not have voluntary manual grasp; moderate: can walk with some support or when the patient globally used the paretic hand without possibility of individual movements of the fingers and; mild: can walk independently15. Mental sub normality (that was evaluate through the level of speech:

aphasia, monosyllable, disyllable, sentences; and school performance: do not attend, special school, special classroom in regular school, normal classroom in regular school 16,17 and; age at manifestation of epilepsy, types of epilepsy, use of antiepileptic drugs, neonatal seizures, family history of seizures and findings from electroencephalogram (EEG), MRI and computed tomography (CT) scan of the brain. Patients were included into CP types based upon the classification proposed by Nelson *et al.*18: spastic quadriplegia (spasticity of all four limbs with involvement of the arms more marked than or equal to that of the legs), spastic diplegia (spasticity of the lower extremities with a variable but a lesser degree of involvement of the upper limbs), spastic hemiplegia (spasticity of the arm and leg on one side), hypotonic and mixed forms (the last one encopass a combination of previous types, as well as athetoid, ataxic and dystonic, due to reduce number of cases).

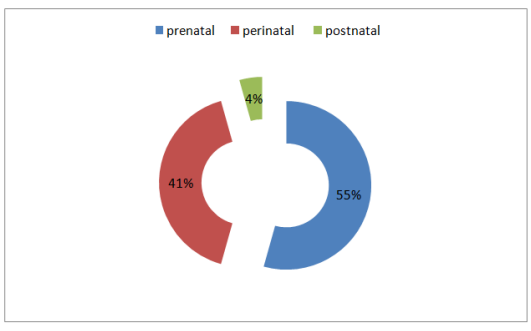
Epilepsy was defined as the occurrence of at least two unprovoked epileptic seizures that were not diagnosed as neonatal or as febrile seizures19. The diagnosis was based on history, clinical description and EEG's findings. Epilepsies were classified in accordance with the International Classification of Epilepsies and Seizure Disorders (ILAE - 1989)20, in which are defined four main categories: partial (including simple, complex and secondary generalized), generalized (including absences, tonic, clonic, tonic-clonics and myoclonics), infantile spasms and undeterminate (when it does not fit in any of the previous category). Seizure outcome was defined as good when the patients were seizure free during the last year while using drugs and when they did not have any relapse of seizures two years after withdrawal of antiepileptic drugs (AED).

RESULTS

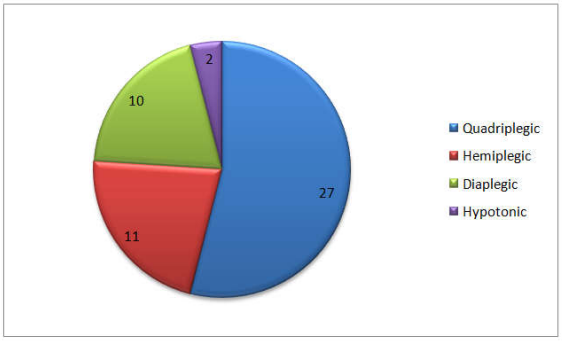
A total of 50 patients with the diagnosis of CP were included in this study (19 girls 38% / and 31 boys 62 %).



Ages ranged from 6 to 150 months (mean age 57 months) and the diagnosis of CP from 1 to 96 months (mean age 8,2 months). From them, 18 were prematures, 32 matures. As far as etiology of CP, 25 were prenatal (55%), 19 perinatal (41%) and 2 postnatal (4%), and In 4 it could not be determined.



Twenty seven were quadriplegic and most of them with very severe and severe disabilities, 11 hemiplegic, 2 hypotonic and 10 diplegic.



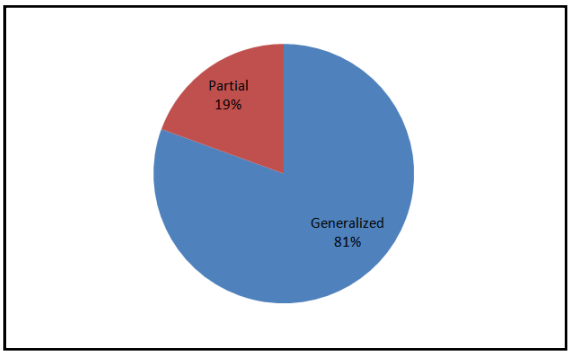
Etiology of brain lesion causing cerebral palsy (CP) Degree of severity in different forms of cerebral palsy (CP)

Causes	
Perinatal n.19	Hypoxia…. 14 Jaundice… 2 Prematurity.. 12
Prenatal n. 25	Maternal…7 APH 6 TOURCH .. 1 Fetal … 18 CNS malformations…7 IVH .. 11
Postnatal n. 2 Indeterminate no. 4	2 (meningitis)

Degree of severity in different forms of cerebral palsy (CP)

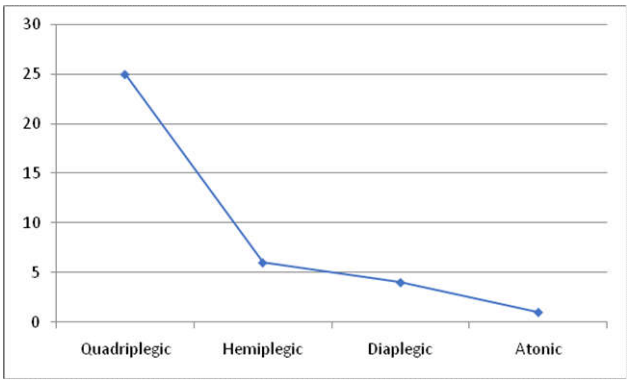
Type of CP	Very sever	Sever	Moderate	Mild	Total
Quadriplegic	11	12	4	0	27
Diaplegic	3	3	2	2	10
Hemiplegic	1	3	4	3	11
Hytonic	0	0	2	0	2

Thirty six patients of 50 had epilepsy (72%). 20 male and 16 female No seizure 14….10 male and 4 female 28 patient developed the first seizure before age of one year (77.7% of the patients.) The average age of the onset of epilepsy was 10 months, 29 generalized (80.5 %) and 7 partial seizures (19.5 %)



The significant difference of incidence of epilepsy in the different types of CP was in spastic hemiplegia (6 patient of 11 patients, 54.5%), spastic diplegia (4 patient of 10 patients, 40 %), Quadriplegic cp (25 patient of 27 patients, 92.5 %) , and atonic CP (1 patient of 2 patients, 50 %).

The distribution of types of epilepsy in the different forms of CP



Factors associated with development of epilepsy in cerebral palsy (CP).

	CP with epilepsy N = 36	CP without epilepsy n= 14
boy/Girl	24/12	10/4
Neonatal seizure	15	5
Positive family history	19	2
CT scan abnormalities	28	9

History of neonatal seizures and family history of epilepsy were correlated with a higher prevalence of epilepsy.

Relationship between mental subnormality and epilepsy

	CP with epilepsy n = 36	CP without epilepsy n= 14
mental subnormality		
Unable to speake	28	9
Special school or did not attend	30	5

There was not apparently any relationship between epilepsy and cognitive level; however, 28 of 36 children with epilepsy unable to speak and 30 of them were placed in special schools or did not attend any type of school. Twenty two (78.6%) of 28 children with aphasia and 15 (50%) of 30 patients who were not attending any type of school carried the diagnosis of CP quadriplegic. Regarding response to anticonvulsant therapy, control of seizures was achieved in 33 cases (53.2%) and 8 of them are without any antiepileptic drug (n=29).

N = 36	
Seizure free = 19 (52.7 %)	Monotherapy = 10
	Polytherapy = 6
	Without drugs = 3
Without control = 17 (47.2%)	Monotherapy = 6
	Polytherapy = 11

Use of antiepileptic drugs (AED) and its success in seizure control in patients with cereberal palsy (CP).

DISCUSSION

Epilepsy is one of the most prevalent neuroimpairment in childhood and is present in 4.0 - 8.8 per 1000 in population-based studies22. When other neuroimpairments (i.e., mental retardation and cerebral palsy) are present, the proportion of epilepsy in these children is strikingly higher 23.

Although seizures can be controlled by pharmacotherapy, epilepsy remains a major cause of anxiety for the family who had children with CP. The patients in this sample are not necessarily representative of the population of children and adolescents with CP since the HC-UFPR is a tertiary institution and for this reason a great number of patients coming to the clinic are the most severely affected. The literature mentioned that there is a straight relationship between epilepsy and degree of motor impairment, as well as their association with mental retardation13,24-26. In our study this is also true, since the majority of qudriplegic patients presented epilepsy and intellectual impairment. Approximately 77.7% of the children with CP had their first seizure under 12 months, which is in accordance with Zafeiriou *et al*.27, while is in contrast with other studies in which the incidence is only 10%28. The incidence of epilepsy in our sample was greater when comparing with the literature 29,30, perhaps related to the higher degree of motor and mental disabilities of the patients studied in these population7,28. The predominant form of epilepsy was generalized, what is in accordance with some studies accomplished in children with or without CP12, 25,31.

Niedemayer32 justified this finding saying that the generalized epileptic form activity can be attributed either to a genetic predisposition, or to a quick secondary bilateral synchronization, such as the one induced sometimes by a frontal focus. On rare occasions, deep sub cortical cerebral lesion can also generate this kind of epileptic form activity. The presence of neonatal seizures has been a useful marker for subsequent epilepsy in CP28. History of neonatal seizures were found in 15 (41.66%) patients from our population studied. Normal CT findings were recorded in only 8 from 36 patients with CP and epilepsy, but this group showed a high degree of motor impairment (2 with very severe, 3 with severe and 4 with moderate motor disability) and when mental subnormality was evaluated all the patients were incapable to articulate words and do not attend any type of school and when so did it in especial schools. The generalized epilepsy was the predominant form in these patients and only 2 were seizure free, one on and the other without AED.

From the patients with CP and epilepsy treated with antiepileptic drugs 19 (52.7 %) were free of seizures, the majority of them on monotherapy. Similar results were obtained in other studies12,30,33. Skatvedt34 found a remission of epilepsy in 43.5% of 46 children with cerebral palsy after 1 year of follow-up. From the 3 patients without use of antiepileptic drugs that are more than 2 years under seizures control, 2 had the generalized form of epilepsy and one of them had mild degree of motor impairment. From 17 patients with epilepsy could not achieved a good control, 11 (64.7%) were on polytherapy. In this study the majority of patients had a severe form of CP and as was mentioned before, there is straight relationship between degree of severity and occurrence of epilepsy. Neonatal seizures and positive family history were a common finding associated with epilepsy, and it is difficult to have seizure control in these patients. Although none of the patients of this study was submitted to surgery intervention, the new antiepileptic drugs, ketogenic diet and advances on surgery intervention are promising in improving the care of epileptic children with mental retardation and cerebral palsy, offering a better quality of life and allowing the integration of these patients and their families in the society.

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