



Prevalence and Predictive Factors of Epilepsy in Children with Cerebral Palsy at Paediatric Institute, Hospital Kuala Lumpur

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Introduction

Cerebral palsy (CP) is one of the most common motor disabilities in childhood. The most recent consensus definition recognizes that: “Cerebral Palsy describes a group of permanent disorders of the development of movement and posture, causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, cognition, communication and behaviour, by epilepsy and by secondary musculoskeletal problems” (1).

Epilepsy is one of the comorbidities that are associated with cerebral palsy affecting about one third of the children diagnosed with epilepsy (2). There are only a few published studies on epilepsy in children with CP so far and there has been a need to have longitudinal studies of children with cerebral palsy and epilepsy to further improve our understanding of the relationship between epilepsy and cerebral palsy(3).

In this study we aim to determine the prevalence of epilepsy in children with CP and also to determine the predictive factors for the presence of epilepsy and drug resistant epilepsy in children with CP in our local cohort of children .

Methodology

This cross-sectional study included 144 children aged between 2 to 18 years old with CP under Paediatric Neurology Unit follow-up at Institute of Paediatrics, Hospital Kuala Lumpur. Children with other neurological conditions giving rise to epilepsy which is not CP for example other neurogenetic conditions as well as parents or legal guardians who did not give consent during the study period were excluded. Written informed consent was obtained from parents or caregivers.

Clinical information, detail seizure history and response to treatment were obtained from their medical records.

Descriptive and univariate analysis were performed with SPSS version 20, with *p* value less than 0.05 was considered significant.

Results

- The prevalence of epilepsy in children with CP in our cohort was 53.5% (77/144).
- Children with cerebral palsy who have epilepsy predominantly male, 80% (89/144), and of Malay ethnicity,
- The mean age onset of epilepsy among children with cerebral palsy was 1.4 years (standard deviation, SD 1.9).
- Predictive factors that were associated with epilepsy were those with quadriplegia, Gross Motor Functional Classification System (GMFCS) level IV and V, and due to non-perinatal aetiologies with *p* value <0.005.
- Only 14% (11/77) of children with CP and epilepsy in our cohort had drug resistant epilepsy.

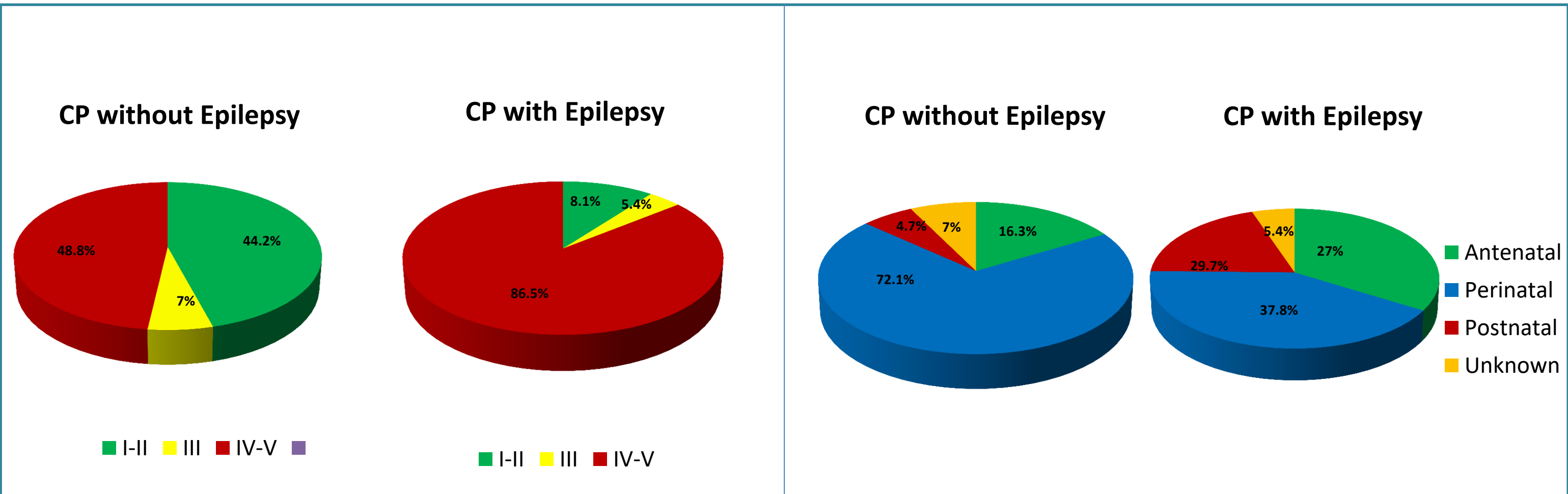


Figure 1: Pie chart showing the distribution of children with cerebral palsy with and without epilepsy according to GMFCS.

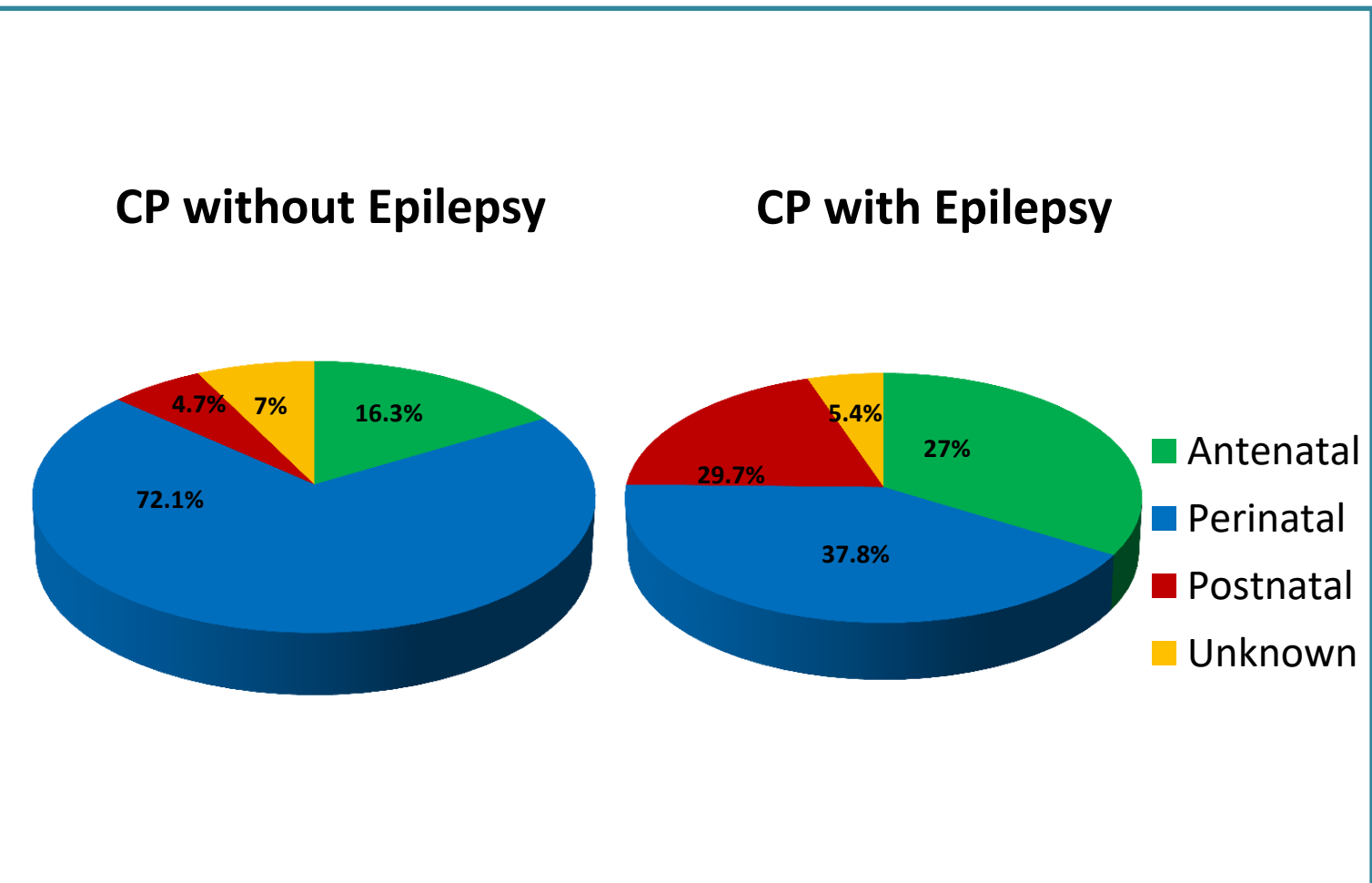


Figure 2: Pie chart showing the distribution of children with cerebral palsy with and without epilepsy according to aetiology.

Variables N=144	CP without Epilepsy N= 67 (%)	CP with Epilepsy N=77 (%)	<i>p</i> value
Aetiology			
Antenatal/Prenatal	11 (16.4)	26 (33)	0.001*
Perinatal	47(70)	32 (41)	
Postnatal	4 (5.9)	15 (19.9)	
Unknown	5 (7.4)	4 (5.19)	
Motor Type			
Spastic	49(73)	40 (31)	0.062*
Dystonic	7 (10.4)	11 (14)	
Mixed spastic/dystonic	8 (11.9)	22(28)	
Choreoathetoid	2 (2.9)	2(2.5)	
Hypotonic	1(1.5)	2 (2.5)	
Topography			
Diplegia	34 (50)	4 (5.19)	<0.000*
Hemiplegia	9 (13.4)	9 (11.6)	
Quadriplegia	22 (32)	60(77)	
Triplesia	1 (1.5)	4 (5.2)	
GMFCS			
Walk independently (I-II)	30 (44.7)	3 (3.8)	<0.000*
Walk with assistive mobility device (III)	4 (5.9)	2 (2.5)	
Unable to Walk even with assistive mobility device (IV-V)	32 (47)	32 (41.5)	
Neuroimaging findings			
Normal	3 (4.47)	2 (2.5)	<0.000*
Stroke	4 (5.9)	6 (7.7)	
Cerebral Atrophy	1 (1.49)	6 (7.7)	
PVL	22 (32.8)	4 (5.19)	
HIE-PLIC	1 (1.49)	11 (8.5)	
Intracranial Bleed	2 (2.9)	4 (5.2)	
Others	8(11.9)	14 (18)	
Not done	19 (28.3)	9 (11.6)	

Table 1: Univariate analysis for factors associated with epilepsy among children with cerebral palsy; * Fisher exact test was done as more than 20% of the cells should have expected frequencies of less than 5

Discussion

- This study reported prevalence of epilepsy among children with cerebral palsy about 53.5%, higher compared to other previous studies (3), this might be due to our setting as national referral centre.
- The occurrence of epilepsy among children with CP was found to be associated with GMFCS score IV-V, non-perinatal aetiologies, and quadriplegia, similar to the findings from Emira S. et al and Elodie et al. (3,5)
- The limitation of this study is its cross sectional design. We are hence unable to determine the causal relationship of the associated factors to the occurrence of cerebral palsy.
- As the data were collected retrospectively, there is a risk of recall bias and misclassification bias.

Conclusion

- This study showed a high prevalence rate of epilepsy among Malaysian children with CP which is higher than to previous studies.
- Severe CP especially those that were due to non-perinatal aetiologies were important predictive factors. However, most of them do not have drug resistant epilepsy (4) .

References

- Venkateswaran S, Sevell MI. Comorbidities and Clinical determinants of outcome in Children with spastic quadriplegic cerebral palsy. Development Medicine Child Neurology 2008;50(3): 216-222
- Pratibha Singhi, Sujeet Jagirdar, Narendra Khandelwal and Prahbjot Malh. Epilepsy in Children with Cerebral Palsy. J Child Neurol 2003; 18; 174.
- Elodie Sellier, Peter Uldall, Eulalia Calado et al.Epilepsy and cerebral palsy: Characteristics and trends in children born 1976 -1988. European Journal Of Paediatric Neurology 16(2012) 48-55.
- Kwan P, Arzimanoglou A, Berg AT, et al. Definition of drug resistant epilepsy: consensus proposal by the ad hoc Task Force of the ILAE Commission on Therapeutic Strategies. Epilepsia. 2010 Jun;51 (6):1069-77
- Emira Svraka (2012). Children with Cerebral Palsy and Epilepsy – Histological, Electroencephalographic and Psychological Aspects, Dr. Dejan Stevanovic (Ed.), ISBN 978-953-51-0082-9, InTech.
- Berg AT, Berkovic SF, Brodie MJ et al. Revised terminology and concepts for organization of seizures and epilepsies: report of the ILAE Commission on Classification and Terminology, 2005-2009. Epilepsia. 2010 Apr; 51(4):676-85

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