

Epilepsy Comorbidity in Children with Cerebral Palsy

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Abstract

Cerebral palsy remains as the most frequent cause of motor delay in the young children. Epilepsy can be found in about one-third of childhood patients with cerebral palsy. All seizure types can be seen. The most common types are partial complex and secondary generalized seizures. Seizures in children associated with cerebral palsy have the tendency of earlier onset, and harder control, correlated with the severity degree of cerebral palsy and the existence of mental impairment. The seizure outcome in patients with cerebral palsy is majorly poor. They usually require long-term medications and poly-therapy, with more chance of intractable seizures and/or status epilepticus.

The risk of seizure recurrence after stopping anticonvulsants in those with cerebral palsy remains high. Factors related to longer seizure-free period in epileptic children having cerebral palsy are normal intelligence quotient, one seizure type, mono-therapy, and spastic diplegic pattern.

Keywords: Cerebral Palsy; Epilepsy; Comorbidity; Children

Editorial

Cerebral palsy (CP) attributes to non-progressive motor impairment during brain development in the early life [1]. CP is the most common developmental disorder associated with long-term motor disability. In developed countries, the prevalence is 1-2/1000 live births [2]. The disorders of CP are frequently accompanied by cognitive impairment, communication problems, sensory defects, behavioral abnormalities, seizure disorders, or a combination of these features [1] depended on the underlying affected brain pathology [3]. The management of CP is multidisciplinary involving a team of specialists in pediatrics, rehabilitation, psychology and social medicine...etc. [4].

Epilepsy appears in 15-60% of patients with CP. In a retrospective, comparative review [5], children with CP had more incidence of epilepsy onset within one year of age (47% vs. 10%), neonatal seizures (19% vs. 3%) and status epilepticus (16% vs. 1.7%), as well as lower incidence of generalized seizure (28% vs. 59%) and seizure-free rate (37% vs. 90%), as compared to control group (epilepsy without CP). Factors related to the longer seizure-free period in epileptic children with CP are normal intelligence quotient, one seizure type, mono-therapy, and spastic diplegic pattern. Another study [6] on the characteristics and epilepsy prognosis in CP children demonstrated the prevalence of epilepsy as 36.1%. Patients with atonic-diplegic, dystonic, tetraplegic and hemiplegic CP had the higher incidence of epilepsy (42~87.5%), compared to control group (epilepsy without CP). Epilepsy was a main prognostic factor in mental function and motor achievement in children with CP. In another retrospective cohort [7] of 452 CP cases, 105 (27.7%) had epilepsy. The mean seizure onset age

was 18.9 months and 64 (60.95%) had the seizure onset age less than 1 year old. Patients with myoclonic seizures as well as infantile spasms had significantly earlier seizure onset. As for the seizure types, generalized seizures were the most common, followed by partial seizures, infantile spasms, and other myoclonic seizures. Among the 105 children with CP & seizure, 45 (42.9%) children got seizure control, most of them requiring poly-therapy. Seizure free rate reached 74% of patients with nearly normal social quotient. Epilepsy incidence occurred in various CP types including spastic hemiplegia (66%), quadriplegia (42.6%) and diplegia (15.8%).

A recent analysis of seizure types in 166 children with CP due to white matter injury [8] showed the following facts of seizure characteristics: seizures beyond one month of age (25%), West syndrome (2.4%), other epileptic syndromes (8.4%), febrile seizure (7.8%), and benign focal seizures (18%). All of the seizures resolved in 80% patients after 2 years. A favorable outcome was demonstrated in this kind of cerebral insult. Another population-based study on neuroimaging pattern in 309 CP children with epilepsy [9] indicated that cerebral mal-development was associated with prepartum antecedents, whereas subcortical/cortical and basal ganglia lesions were associated with intrapartum and postpartum antecedents, suggesting fewer involvements of the white matter injuries in their neuroimaging patterns [10].

In children, the risk factors for seizure recurrence were reported as abnormal electroencephalographic findings, epileptic syndrome, serious head injury and CP.

In conclusion, many case series and population-based studies have explored epilepsy as a comorbidity of in children with CP. Children with CP have a significant risk of developing epilepsy. Though there may be a shared neurobiology of epilepsy and CP, further prospective studies to disclose the true association between them are necessary.

References

1. Aisen ML, Kerkovich D, Mast J, Mulroy S, Wren TA, et al. (2011) Cerebral palsy: clinical care and neurological rehabilitation. *Lancet Neurol* 10: 844-852.
2. Paneth N, Hong T, Korzeniewski S (2006) The descriptive epidemiology of cerebral palsy. *Clin Perinatol* 33: 251-267.
3. O'Shea TM (2008) Diagnosis, treatment, and prevention of cerebral palsy. *Clin Obstet Gynecol* 51: 816-828.
4. Gulati S, Sondhi V (2017) Cerebral palsy: an overview. *Indian J Pediatr*.
5. Kwong KL, Wong SN, So KT (1998) Epilepsy in children with cerebral palsy. *Pediatr Neurol* 19: 31-36.
6. Zafeiriou DI, Kontopoulos EE, Tsikoulas I (1999) Characteristics and prognosis of epilepsy in children with cerebral palsy. *Child Neurol* 14: 289-294.
7. Singhi P, Jagirdar S, Khandelwal N, Malhi P (2003) Epilepsy in children with cerebral palsy. *J Child Neurol* 18: 174-179.

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8. Cooper MS, Mackay MT, Fahey M, Reddihough D, Reid SM, et al. (2017) Seizures in children with cerebral palsy and white matter injury. *Pediatrics* 139.
 9. Ahlin K, Jacobsson B, Nilsson S, Himmelmann K (2017) Antecedents and neuroimaging patterns in cerebral palsy with epilepsy and cognitive impairment: a population-based study in children born at term. *Acta Obstet Gynecol Scand* 96: 828-836.
 10. Liu G, Slater N, Perkins A (2017) Epilepsy: Treatment options. *Am Fam Physician* 96: 87-96.