Mini Review Article

Journal of Pediatric Neurological Disorders

Children with Cerebral Palsy's Cognitive Abilities

Abstract

Children who have Cerebral Palsy (CP) are more likely to have cognitive decline. The assessment of cognition in children with cerebral palsy is covered in this narrative review of the literature, along with the most important aspects of cognitive functioning specific to each subtype and discussions of the connections between brain injury, functioning, and intervention from a developmental standpoint. A search for original research on cognitive performance in kids with various CP subtypes was conducted. The search produced 81 distinct hits. Few studies included a representative sample of kids with CP, and each participant was evaluated individually. Children with the most severe motor disabilities frequently had their cognitive ability assumed and not tested.

Keywords: Cerebral palsy • Cognitive performance • Developmental standpoint • Motor disabilities • Cognitive ability

Sandy Gills*

Department of Neurophysiology, Claude Bernard University

*Author for correspondence: gillssandy@cbu.ac.fr

Received: 01-Aug-2023, **Manuscript No**. pnn-23-111116; **Editor assigned:** 07-Aug-2023, **PreQC No**. pnn-23-111116(PQ); **Reviewed:** 14- Aug-2023, QC No. pnn-23-111116; **Revised:** 22-Apr-2023, **Manuscript No**. pnn-23-111116; **Published:** 31-Aug-2023, DOI: 10.37532/pnn.2023.6(4).85-86

Introduction

Children with Cerebral Palsy (CP), which is brought on by an inherited or early acquired brain lesion1, may also have cognitive and other non-motor deficits. Spastic, dyskinetic , and ataxic subtypes each have a different range of cognitive impairments.2The validity of the evaluations is a key factor in the detection of cognitive impairments, so the first goal of this study is to review issues in that area. On the basis of a review of the literature on cognitive functioning in children with CP, cognitive functioning in children with CP will be explored in this review from a developmental perspective [1].

Global cognitive impairment

Estimates of the percentage of children with cerebral palsy who have IQs below 70 range widely, although Western nations with national registries say that the percentage is between 30% and 40%. Severe cognitive deficits are linked to spastic quadriplegia, epilepsy, severe motor impairment, and brain abnormalities. With an IQ of less than 70, intellectual development disorders can be recognized. Nevertheless, the diagnostic criteria2 stipulates that there must also be a significant impairment in a wide variety of daily tasks. Because there aren't enough adequate tools for evaluating adaptive functioning in children in GMFCS levels III to V, difficulties with the latter shouldn't just be attributed to motor impairment. Furthermore, even if the profile is skewed and performance is consistent with age expectations in one or more areas, it would not be advisable to diagnose intellectual disability even if the full-scale IQ score is below [2].

Unilateral spastic CP

The majority of kids with unilateral CP are cognitively normal; 81% to 89% are said to have IQs above .Children with left-sided paresis and children born preterm and at term do not have significantly different IQ scores. Epilepsy and lower IQ are related. One-third of students have unique learning disabilities, including executive functioning, visual-spatial cognition, and the acquisition of visual imagery. Children with right-sided paresis demonstrate the plasticity of the growing brain through their language abilities. Language is frequently preserved, in contrast to what would occur if adults suffered comparable localized brain damage in the left hemisphere. Additionally, there is no distinction in verbal IQ between children with unilateral unilateral left versus right brain injuries. The cost of this right-hemispheric restructuring of language, however,

is a lower performance IQ [3, 4].

Ataxia

Around 5% to 6% of those with CP have ataxic CP, and 42% to 67% of them are reported to have an IQ below 70. There are no studies that have only looked at this population, therefore little is known about the specific deficits [5].

Discussion

Recent MRI research has improved our knowledge of the intricate connections between brain injuries and functioning, particularly when utilizing diffusion tensor imaging, which enables more accurate descriptions of white matter pathways. Dyskinetic CP has been associated with an immediate and severe intrapartum hypoxic-ischaemic insult at term, whereas diplegia is frequently observed in PVL-positive preterm infants. However, only 85% to 90% of children with CP have a lesion that can be seen on an MRI. White and grey matter lesions, as well as other types of lesions, are present in all categories of lesions. Cognition has been observed to range between normal and severe intellectual disability in children with the same type of injury. Studies have reported conflicting relationships between IQ scores and MRI results, which suggests that these scanning methods cannot reliably predict cognitive performance. Acute severe prenatal hypoxia-ischemia can cause no motor abnormalities but can cause cognitive problems. It is well known that language may be reorganized in the right hemisphere and may even be the child's strongest skill in cases with unilateral left hemispheric injuries. However, if the lesion is more extensive, the developing brain is vulnerable [6, 7].

Preterm birth carries a risk of cognitive impairment and CP, particularly if it results in infarction. Early gestational age does not, however, always translate into greater cognitive problems in CP offspring. There is no correlation between cognition and gestational age in bilateral spastic CP; however the proportion of patients with significant cognitive impairment increased as gestational age rose [8].

Together, this implies that cognitive functioning cannot be inferred from MRI findings alone, or from information about brain lesion, epilepsy, gestational age at birth, and motor functioning. Instead, the initial brain lesion can be-viewed as a constraint on development. Cognitive impairments are the result of reciprocal and continuing interactions between the child and their environment, influenced by the child's opportunities for active exploration and participation. Knowledge about the risk factors is important because it can lead to awareness about the need for assessment and interventions, and aid in developing follow-up programmes [9, 10].

References

1. Osenbaum P, Paneth N, Leviton A *et al*. A report: the definition and classification of cerebral palsy April2006. *Dev Med Child Neurol*. 49, 8-142 (2007).
2. Palisano R, Rosenbaum P, Walter S *et al*. Development and reliability of a system to classify gross motor function in children with cere-bral palsy. *Dev Med Child Neurol*. 39, 214-234 (1997).
3. Andersen GL, Irgens LM, Haagaas I *et al*. Cerebral palsy in Norway: prevalence, subtypes and severity. *Eur J Paediatr Neurol*. 12, 4–135 (2008).
4. Himmelmann K, Beckung E, Hagberg G *et al*. Gross and fine motor function and accompanying impairments in cerebral palsy. *Dev Med Child Neurol*. 48, 417-23.6 (2006).
5. Murphy CC, Yeargin AM, Decoufle P *et al*. Prevalence of cerebral palsy among ten-year-old children in metropolitan Atlanta, 1985 through 1987. *J Pediatr*. 123, 13-208 (1993).
6. T€urkoglu G, T€urkoglu S, Cßelik C *et al*. Intelligence, functioning, and related factors in children with cerebral palsy. *Arch Neuropsychiatry*. 54, 33-79 (2017).
7. Sigurdardottir S, Eiriksdottir A, Gunnarsdottir E *et al*. Cognitive profile in young Icelandic children with cerebral palsy. *Dev Med Child Neurol*. 50, 357-6210 (2008).
8. Hutton J, Pharoah P. Effects of cognitive, motor, and sensory disabilities on survival in cerebral palsy. *Arch Dis Child*. 86, 84-89(2002).
9. Elnik N, Lahat E, Heyman E *et al*. The role of pre-maturity in patients with hemiplegic cerebral palsy. *J Child Neurol*. 31, 678-682 (2016).
10. Arlsson G, Uvebrant P, Hugdahl K *et al*. Verbal and non-verbal function of children with right-versus left-hemiplegiccerebral palsy of pre-and perinatal origin. *Dev Med Child Neurol*. 36, 503-512 (1994).