

Our Kid Patient is a Challenged Child: What to do? (Visual Assessment In Neuro-developmental Disorders)

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Neurodevelopmental disorders (NDDs) arise due to a significant and persistent disruption to the complex and dynamic relationship between genetic, neurological, cognitive, emotional and behavioural processes during the period of active development.¹ They comprise a wide range of conditions, presenting with intellectual, behavioural and motor impairments, and a significant proportion of them are complicated by visual difficulties. Due to paucity of substantial data regarding the burden and risk factors of these conditions, definitive guidelines and protocols for their effective management and rehabilitation, are

severely lacking.

A recent population-based study published by Arora et al in 2018, surveyed the prevalence of common NDDs across five geographically diverse sites in India. Site-specific prevalence between two to six-year-old children, was found to range between 2.9% and 18.7%, while it was noted to range between 6.5% and 18.5% in children between six and nine years of age. While hearing impairment and intellectual disability were the commonest encountered, children with epilepsy, neuromotor impairments including cerebral palsy, autism spectrum disorders, attention deficit hyperactivity disorder, learning disorders etc, were also assessed. They established delayed crying, perinatal asphyxia, neurological infections, low birth weight and prematurity as definitive risk factors for the genesis of NDDs.²

The association between neuro-developmental disorders and severe visual impairment or blindness, has also been extensively researched over the years. An increased prevalence of visual impairment in children with neuro-developmental disorders as compared to other children, has been established (10.5% vs 0.16%).³ The significance and necessity of detailed ophthalmological examination in children presenting with visual complaints, has been apportioned due significance in

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literature. However, owing to the variation in visual performance by these children during the day, and also from one day to another, a significant portion of these symptoms may go undetected. Furthermore, intellectual disability or behaviour abnormalities in a number of these children, may contribute to these symptoms not being adequately perceived by the care-giver.⁴

Early onset of low vision may perpetuate a vicious cycle in these children, contributing to a poor quality of life, dependence and disability. Forms of visual impairment, which are amenable to treatment or rehabilitation, may progress to severe, dense, irreversible amblyopia. It may also affect overall development and social functioning of the child, affecting integration of input from other senses, speech and language, cognition and motor functioning.⁵ Many children may have no difficulty in vision, but considerable impediment in interpreting the visual information due to damage to pathways leading from the visual cortex to the higher centres, or damage to the higher centres themselves. These are termed as 'visual-perceptual' problems.⁶

Moreover, while one traditionally focusses on ocular dysfunction or affectation of the optic nerves in the assessment, visual impairment may result from damage anywhere along the course of the visual pathway. When the pathology arises in the retro-chiasmal pathway, particularly during the early peri-natal period, it is termed as 'cortical/cerebral visual impairment' (CVI). It is found to be the primary cause of congenital visual

impairment in the economically developed nations. It is also more likely to remain undetected or misdiagnosed as intellectual or behavioural anomaly, due to the absence of ocular pathology.⁷ A study conducted by Gorrie et al established that CVI has been documented in a large proportion of children with NDDs. This further highlighted the need for screening in children with Additional Support Needs (ASN), especially those with NDDs.⁸

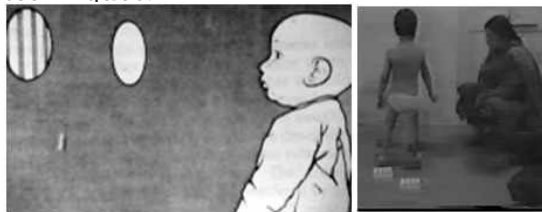


Management includes assessment of functional vision for children with visual impairment.⁹ It is an assessment of how a child uses the vision he or she has in everyday life. Since a child's visual condition and abilities can change over time, the functional vision assessment needs to be repeated periodically. Assessment of visual acuity is done by a combination of preferential looking technique and visual function battery this helps in establishing vision over an entire range of low vision.

Vision Therapy

The vision therapy is an aid to visually rehabilitate these children by enhancing

Visual stimulation, visual efficiency and visual utilisation by the following techniques:



- Alterations to the child's environment such as need of additional light, use of higher contrast or avoidance of glare for certain tasks.
- Use of Low Vision Devices such as telescopes, magnifiers, CCTV, Large prints.¹⁰
- Adaptations to learning media, modifications to learning material, training for orientation and mobility.
- Vision stimulation programme for CVI.¹¹
- Vision therapy for concerns like difficulty in focussing, abnormal fixation, poor tracking, poor scanning, impaired saccadic and pursuit eye movements.¹²

Take Home Message For A General Practitioner

1. Most of the NDD's happen in utero and has its origin from maternal infection or inflammation.
2. So preventive therapies or care of the mother in the antenatal period is of great importance.
3. Good food, exercise, avoidance of smoking, alcohol, inhalation pesticides and pollutants portend a better postnatal course.
4. In case NDD develops, then active, therapies like physio, occupational,

speech therapy, vision therapy and glasses go a long way in the rehabilitation process rendering the children to be individuals with a better quality of life.



References

1. Boivin MJ, Kakooza AM, Warf BC, Davidson LL, Grigorenko EL. Reducing neurodevelopmental disorders and disability through research and interventions. *Nature*. 2015; 527: S155-160.
2. Arora NK, Nair MKC, Gulati S, Deshmukh V, Mohapatra A, Mishra D et al. Neurodevelopmental disorders in children aged 2-9 years: Population-based burden estimates across five regions in India. *PLOS Medicine*. 2018; 15(7): e1002615.
3. Das M, Spowart K, Crossley S, Dutton GN. Evidence that children with special needs all require visual assessment. *Arch Dis Child*. 2010; 95(11):888-92.
4. Dutton GN. Structured history taking to characterize visual dysfunction and plan optimal habilitation for children with cerebral visual impairment. *Developmental Medicine & Child Neurology*. 2011; 53(5):390-390.
5. Sonksen PM, Dale N. Visual impairment in infancy: impact on neurodevelopmental and neurobiological processes. *Dev Med Child Neurol*. 2002; 44:782-91.
6. Bowman R. The importance of assessing vision in disabled children - and how to do it. *Community Eye Health*. 2016; 29(93):12-13.
7. Philip SS, Dutton GN. Identifying and characterising cerebral visual impairment in children: a review. *Clinical and Experimental*

- Optometry*. 2014; 97(3):196-208.
8. Gorrie F, Goodall K, Rush R, Ravenscroft J (2019) Towards population screening for Cerebral Visual Impairment: Validity of the Five Questions and the CVI Questionnaire. *PLoS ONE* 14(3): e0214290
 9. August Colenbrander Assessment of functional vision and its rehabilitation: *Acta Ophthalmologica* March 2010; 88, (2): 159-269,
 10. Taha A. Labib et al Assessment and Management of Children with Visual Impairment: *Middle East Afr J Ophthalmol*. 2009 Apr-Jun; 16(2): 64-68.
 11. Li-Ting Tsai, et al A New Visual Stimulation Program for Improving Visual Acuity in Children with Visual Impairment: A Pilot Study *Front Hum Neurosci*. 2016; 10: 157.
 12. Rachel A Coulter Understanding the Visual Symptoms of Individuals with Autism Spectrum Disorder (ASD): *Optometry & Vision Development*. 2009, Volume 40/Number 3.

A Randomized Trial of Early Endovenous Ablation in Venous Ulceration

venous disease is the most common cause of leg ulceration. Although compression therapy improves venous ulcer healing, it does not treat the underlying causes of venous hypertension. Treatment of superficial venous reflux has been shown to reduce the rate of ulcer recurrence, but the effect of early endovenous ablation of superficial venous reflux on ulcer healing remains unclear.

Early endovenous ablation of superficial venous reflux resulted in faster healing of venous leg ulcers and more time free from ulcers than deferred endovenous ablation.

Manjit S. Gohel, Francine Heatley, Xinxue Liu, The NEJM, 2018, Vol 378, 2105

Chronic obstructive pulmonary disease 2

Palliative care and management of troublesome symptoms for people with chronic obstructive pulmonary disease

Palliative care could have a prominent role in the management of people with COPD. Palliative care is “an approach that improves the quality of life of patients and their families facing the problems associated with life-threatening illness, through the prevention and relief of suffering.” The person is put before the disease, life is affirmed, and death is regarded as a normal process. Palliative care supports people to live fully through the early identification and impeccable assessment and treatment of physical, psychosocial, and spiritual concerns by providing education about the disease to patients and families and discussing treatment preferences towards the end of life.

The more severe and unremitting the breathlessness is, the more likely the need for pharmacological treatment. Three main drug classes are routinely used to palliate breathlessness: opioids, benzodiazepines, and antidepressants.

Matthew Maddocks, Natasha Lovell, Sara Booth, William D-C Man, Irene J Higginson, The Lancet, 2017, Vol 390, 988-992